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ECOTOX

ECOTOXicology Knowledgebase System

User Guide – Version 5.0

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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 Knowledgebase.

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 Knowledgebase 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 in to the ECOTOX Knowledgebase.

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 Knowledgebase (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 Knowledgebase contact:

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U.S. Environmental Protection Agency
Office of Research and Development
National Health and Environmental Effects Research Laboratory
Mid-Continent Ecology Division (MED)
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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 Javascript enabled World Wide Web browser and Internet connectivity. 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 has been tested using FireFox, Internet Explorer and Google Chrome.
- There is a maximum number of 5,000 tabular records that can be retrieved in one search.
- 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

Home

The Home page provides a general overview of the ECOTOX Knowledgebase with links to Search, Explore**,** Help, Contact Us, About ECOTOX, Getting Started, Data Visualizations, Search Tips, ASCII Data Download, and Other Links to Limitations, Frequent Questions, Other Tools/Databases and Recent Additions. These selections will open the requested information. To avoid losing your current Explore and Search selections, left click the link and open in a new window.

About ECOTOX: This section of the website provides a general overview of the ECOTOX Knowledgebase, including the history of the system's development, and our Help Center linkages which describes the ECOTOX web site contents and navigational resources available.

This printable User Guide is available in PDF (Portable Document Format) under the PDF Documentation section as "ECOTOX User Guide" and the "ECOTOX Code Appendix". 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:

Starting Out - Information on how to begin navigating and searching the ECOTOX Web site. This page also provides links to the limitations associated with the ECOTOX Knowledgebase, Recent additions, Navigational help, Frequent questions 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... – Provides information on how to perform searches, select Search parameters and Report format, and Navigate or retrieve output in ECOTOX.

What is... – Provides links to Data Field definitions and codes for each field available within ECOTOX searches and output. It also provides a Database overview on data sources, including Species and Chemical verification sources used by the ECOTOX staff. For a brief overview of coding practices used within ECOTOX see Appendix C.

More Resources – Includes a glossary of terms and links to related websites. Providing these links does not imply endorsement by the U.S. EPA.

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

Criteria	Requirement/Inclusions	Limitations/Exclusions
Chemical	• Single chemicals relevant to environmental exposure are included. • Verifiable Chemical Abstract Services (CAS) number	• Mixtures (petroleum fuels) • Air pollution (CO_2 and ozone)
Species	• Ecologically relevant species • Priority species are wild (test results for terrestrial domestic and laboratory species are used to fill data gaps when needed) • Organism taxonomic information verifiable against standard taxonomic sources	• Human, monkey, bacteria, viral and yeast
Effect/ Response	• Biological effect on live, whole organisms • Adverse effects are priority (beneficial, nutritional effects are lower priority)	• Dead organisms

Criteria	Requirement/Inclusions	Limitations/Exclusions
Concentration/ Dose	• Concurrent environmental chemical concentration/dose reported as concentration, dose or application rate. • Sediment studies must have a water concentration reported to be included	• Inhalation dose route (including intratracheal instillation) • Lead shot • Sediment only concentration • Unverified measurement unit. • Log values
Exposure Duration	• Duration reports an associated concurrent with a biological effect	• Unverifiable duration
Publication /Data Format	• Primary data source. • Full text English (some Non--English papers are encoded that have an English abstracts)	• Reviews • Full text foreign language. • Abstract only format

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

- In 'Search' there is a maximum number of 5000 tabular and full browser viewable records that can be retrieved in one search. In 'Explore' there is a maximum of 3,000 records that can be viewed but unlimited data records can be retrieved.
- 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.

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 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.

Search

The ECOTOX Knowledgebase "Search" function provides a direct method to retrieve data that can be refined by limiting the search parameters, e.g. Chemical, Species, Endpoint, Control, Media Type. Once you have selected your search options, you are able to view the report in the browser or export in an Excel or delimited format. Search utilizes all available search and output features.

Explore

The ECOTOX Knowledgebase Explore function is an interactive way to examine search paths by Chemical, Species, Effects and Publications. Once you selected the path to explore, additional data fields will be displayed to filter data, e.g. Effects, Endpoints, Publication Year.

During the exploration there are also options to examine the data visually via plotting functions. Once you have completed your exploration, you are able to select report output options or forward your Explore parameters to the ECOTOX Search for further refinement.

OVERVIEW OF SEARCH OPTIONS

Database retrievals can be conducted using either 'Search' or 'Explore'. **Search** supports queries on species, chemicals, effect group, effect measurement, endpoint and publication year. **Search** includes all options under **Explore**, and enables you to focus on additional 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 or an ASCII delimited file format, which can be transferred into a database or spreadsheet.

When you are within the 'Search' page and you click on a inside of a text entry box or output display field, context-sensitive help will display in a separate window. You may navigate within the help window without affecting your search session.

Search Strategy Basics

Either of the 'Search' or 'Explore 'pages are designed to search on all data, unless you restrict the search by choosing specific 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 Knowledgebase and Appendix E for specific data field descriptions.

Overview of Search and Explore Pages

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.

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

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)).

Green buttons are used for general changes when new items are applied. Red buttons are used when you are removing or resetting information. Blue buttons are used for general functionality and switching among sections in ECOTOX.

You must search on at least one parameter. Any selections made using multiple parameter search boxes within ‘Search’ or ‘Explore’ page will narrow the search result.

Key Functions

There are some functions that can aid in searching. These Key Functions include:

Update Search - Updates query to most recently selected parameters in “Search’ page

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

Aquatic Button - Loads or filters to only Aquatic results.

Terrestrial Button - Loads or filters to only Terrestrial results.

Change Display Fields - A popup window that allows you to change fields that are displayed in the search results. Note that this option will not be available until a Search has been conducted.

Export as…- A drop-down menu will appear, allowing Excel or Delimited as export types for results.

View All Applied - A popup window will appear showing parameters applied to your search.

Condensed (Excel Only) - Under the Settings icon next to “Export as…”, you can choose to have full output version of test results by Deselecting the checkbox next to “Condensed”. The default is that “Condensed” is selected and all values appear in a separate column of the report.

References- By selecting the references button you can view all reference citations for the search.

Options for Searching in ECOTOX

‘Search’ provides a broader range of search parameters than those available in the ‘Explore’. 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 Knowledgebase may be reduced.

You must search on at least one parameter. Any additional selections made from other search parameter menus within the SEARCH will narrow the search result. ECOTOX offers the following search options:

Search Page Menu: The home page on the SEARCH provides an overview of how to navigate within Search. SEARCH has a navigational tool bar located at the left of the page, which will allow you to navigate to different search parameters (All Chemicals, Effects, Endpoints, Species, Test Conditions, Publication Options).

All Chemicals – Specific or Multiple Chemical Entry using either the Chemical Abstract Services (CAS) Registry number or chemical name to identify the substance(s) or Predefined Chemical Groups

All Effects - Specific or Multiple Effects or Measurements

All Endpoints- Specific or Multiple Concentration Based endpoints, Time Based endpoints, Bioaccumulation/Bioconcentration Factor endpoints, or No Endpoints

All Species - Specific or Multiple Taxonomic Entry using either the scientific name, common name, or ECOTOX species number to identify the organism(s) or Predefined Taxonomic Groups

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

All Publication Options – Author, Reference Number, Publication Year, Independently Compiled Data and Recent Modifications/Additions

As you are making your search selections, the selections appear in the left frame navigation tool. You may also review your search selections using the 'View All Applied' button after 'Update Search' has been applied. To return to the default search parameters, select 'Reset All'.

NOTE: In **Search**, for the Chemical and Species pages, any entries selected on the page combines selections into a single query. For example, if you search *Daphnia magna* and select "Fish" under All Species, the result will be the combination of all fish species and the *Daphnia magna* species.

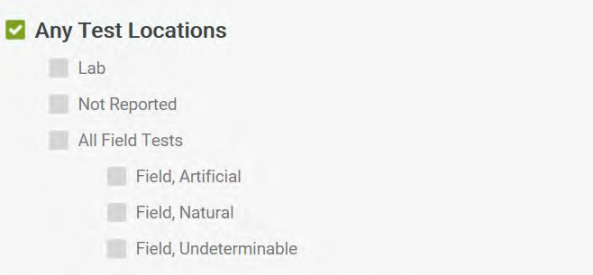
The ECOTOX Search is designed to lead you through a search session using multiple forms. The left frame provides a menu and navigational search forms containing search parameter selections. You must use the navigation tool bar to move from form to form within Search. Using your browser's Back button will result in the loss of all entries made in any of the ECOTOX forms.

Each **Search** selection box is labeled and a question mark . When you click on this icon, context-specific help is presented. Each box also includes a 'Reset' button

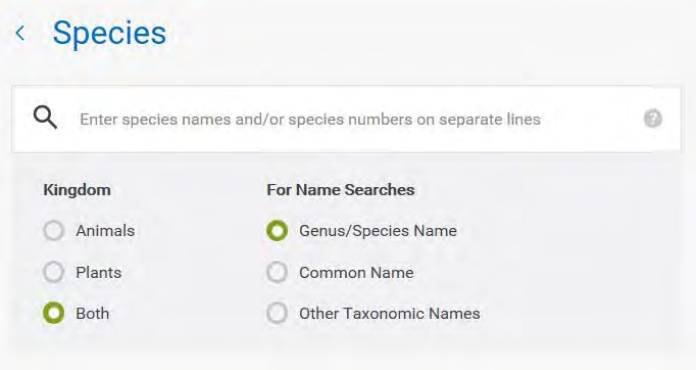
in the upper right-hand corner of the box. When you click on ‘Reset’ all selections within the box are removed.

Search selection types include:

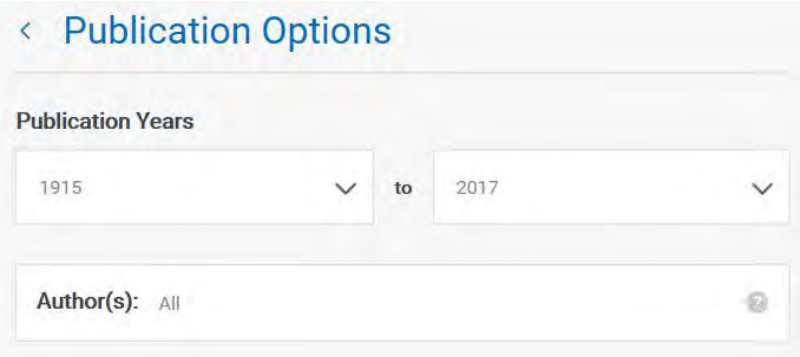
Checkbox: To select an item, click on the check box you want to include. To remove a selection, click on the checkbox again. You can select one or more items.



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.



Text Entry: Chemical, Effects, Species, Author, or Reference Number searches may 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). You may enter both text and numeric data into text boxes.

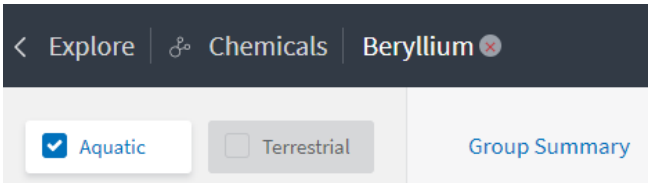
View/Edit**:** For predefined groups within the 'Search' parameters, you can view and/or further edit your selected lists, after 'Update Search' has been completed. To access the view and edit feature, click on the button located at the bottom for the search box labeled "View/Modify Entries for Selected Groups." This will display a popup window with detailed list(s) for selections. You can make a change by Deselecting any search selection and Save Modifications. You must select 'Update Search' to change the data output. A 'Restore All' link is also provided to return the parameter to the default selections. If you are viewing and do not want to make any changes, select the 'Cancel' button.

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

Explore Page Menu

The 'Explore' function supports searches on Chemicals, Predefined Species Groups, and Effects Groups. All Query Filters are available within the **Explore** menu, but you cannot modify the sort order or data field display within the report. The query options within **Explore** are also available in **Search**, but the **Search** contains more search and output options.

A directory path noting the location in the **Explore** function appears in the top banner.



You can move up the path by closing the level using the button. Selecting the back button returns you to the Main Explore page.

ECOTOX offers the following Explore options:

- Chemical: Within the Chemical Entry search box, you may select any or multiple Chemicals Groups in the to Explore Data
- Species: Within the Species Group, you may select any or multiple Species Groups in the list to Explore Data
- Effects: Within the Effects Group, you may select any or multiple Effect Groups in the Group list to Explore Data

ECOTOX DATA SEARCHES

To retrieve ECOTOX data, select either the '**Search**' or '**Explore'** on the Home page banner. The query page will then load. If you transfer from between the **Search** and **Explore** functions, however, you will lose your current search strategy.

USING THE "SEARCH" FUNCTION TO LOCATE DATA

Chemical Searches

Under the **'**All Chemicals' search tab, 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 Knowledgebase, and this is the name displayed on report even if search was conducted using a common or trade name of a substance. ECOTOX includes chemical synonym searching as an option, however if a synonym is used by more than one CAS number, both chemicals will be queried.

Chemical Entry

To conduct a search, type in the CAS Registry number(s) and/or chemical name(s). You may enter the CAS Registry number with or without hyphens and leading zeroes. CAS number queries are always exact matches.

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.

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. If you enter the term *benzene*, the data report will contain results for all chemicals with benzene in the name It is recommended that you search on CAS Registry numbers (CASRN), when you want to specifically restrict your search to selected chemical(s).

Chemical Dashboard: On the 'All Chemicals' searching parameter, there is a link that directs you to the EPA's CompTox Chemistry Dashboard to search by CASRN for more information on a chemical.

Note: You may enter the CAS Registry number with or without hyphens in to ECOTOX searches, but exact CAS Registry number with hyphens is preferred for the CompTox Chemistry Dashboard searches.

Predefined Chemical Groups

The option to select from predefined lists is available in the 'Search' function. Chemical lists have been provided to effectively search a variety of Metal/Organometal or Organic compounds chemical groups. To select a chemical group or specific chemical(s) of interest, click on the check box you want to search. To unselect, click on the checkbox again.

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 ie, 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, ie 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 CAS Registry number.

Pesticides: Pesticides are usually found by typing the common synonym name or trade name. Chemical CAS Registry numbers may be located via link to *EPA's Chemistry Dashboard* or other chemical indexing resources.

Search by Effect Measurements

Under the **'**All Effects' search tab, you can conduct queries on specific effect measurements (including Delayed Effects results) or by predefined group of effects.

The default within the ECOTOX Knowledgebase is that all effects are selected for searching. All coded effects are categorized into one of 11 major effect groupings such as Accumulation, Growth, Mortality, etc.

Each effect includes a list of observed measurements. For instance, the Effect Measurement "Biochemical Group" includes three effect categories: *biochemical*, *enzyme*, and *hormone*. Within each of these effects there are multiple measurements located under "View/Modify Entries for the Selected Group(s)

For further refinement of observed effect information, you may click on the "View/Modify Entries." 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/Modify entries window allows you to view and edit effect measurements to include in your search. To remove a specific measurement, click on the highlighted blue box to remove the effect. You may select more than one measurement to remove by clicking on the highlighted blue box. You may restore measurements by clicking on the “Restore All” default button. If only a few effect measurements are desired, select “Clear All” and reselect only those measurements of interest. When you are done, click on the “Save Modifications “button to close the window and return the Search page. If you click on your browser “Back” button, your edits will not be saved.

You must select “Update Search “to apply changes to the output.

Delayed Effects Results**:** Within the All Effects tab this option allows you to include results responses observed during a post exposure period. If a study includes observations of organisms after the chemical exposure has been discontinued, these measurements are identified as ‘Delayed Effects’.

When using the Search feature, any available Delayed Effects can be included in the results by selecting the ‘Include Delayed Effects Results’ checkbox under the All Effects search parameter. Records for Delayed Effects can be recognized by clicking the ‘Change Display Fields’ button and selecting the ‘Display lookup codes instead of descriptions’ checkbox at the bottom of the pop-up window. Delayed effects will be displayed with a tilde (~) in front of the Effect Code. For example, a delayed mortality effect would have ~MOR for the Effect Code.

Note: When using the Explore feature, Delayed Effects are automatically included in a query and currently cannot be separated.

Search by Endpoints

Under the **‘**All Endpoints’ search tab, you can conduct queries on any or all specific endpoints or by predefined group of effects.

The default within the ECOTOX Knowledgebase is that “All Endpoints” are selected for searching. 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) incorporated into ECOTOX allowed only results based on percent change from control.

For each toxicity test record, pertinent information on test results presented by the authors are encoded within the database. Endpoint information is coded if it is reported by the author.

Within the Any Endpoints tab, you can click on one or more endpoints within the checkbox to select endpoints to include in your query. The Endpoint selection box is divided into the following the following sections: either

Concentration-Based or Time-Based Endpoints, Bioaccumulation / Bioconcentration factors (all statistically-derived, or calculated as reported by the author or determined by the ECOTOX staff), or Statistics No Endpoint (which contains statistically analyzed data but authors did not identify a specific endpoint or one could not be determined by ECOTOX staff) or Endpoint Not Reported (NR) where data was not statistically analyzed.

The “View All Applied” box allows you to view and export all search parameters. More endpoints can be selected after conducting initial search but you must select “Update Search“ to apply changes to the output.

Search by Taxonomy

Under the “All Species” search tab, conduct a search by using Species Names or Number(s), or by using Predefined Species Groups. 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 Knowledgebase will present the results using the currently acceptable genus and species name.

Taxonomic Entry

You can search for an unlimited number of entries but each entry must be entered on a separate line or separated by a comma. 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).

Genus/Species Name*:* You can conduct a search on whole or fragments of scientific names (Genus, Species).

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.

Other Taxonomic Names: Key taxonomic levels (Kingdom, Phylum, Class, Order, Family) searches are available by typing the appropriate scientific name.

Predefined Species Groups

Species lists have been provided to effectively search a variety of species groups.

For further refinement of a species group, you may click on the “View/Modify Entries for Selected Groups” button located at the bottom of the Species selection box. A new window will open and display the list of specific species for each of the selected groups.

The View/Modify entries window allows you to view and edit species to include in your search. To remove a specific species, click on the highlighted blue box to remove the species. You may select more than one species to remove by clicking on the highlighted blue box. You may restore species by clicking on the “Restore All” default button. If only a few species are desired, select “Clear All” and reselect only those species of interest. When completed, click on the “Save Modifications” button to close window and return the Search page. If you click on your browser “Back” button, your edits will not be saved.

You must select “Update Search“to apply changes to the output.

Note: 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 in ‘Search’. The kingdom is searched using a radio button option located within “All Species” as “Plants” for the plant kingdom or “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.

Search Tips for Taxonomic Searches

By clicking on All Species on the frame at the left 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.

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.

Search by Test Conditions

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 “Any Test location, Any Exposure media, Any Exposures types, Any Control types and “Any Chemical analysis”

The options for searching by test conditions are briefly described below.

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 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, 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. All *In vitro* assays may not be included. The terrestrial plant database contains some studies using excised organs and cell cultures from plants, but these types of studies are not currently coded.

Control Type

Control Type allows the capability to filter test records based on author reported test control types, as well as the ability to select specific control type(s).

Individual control types may be selected by choosing the appropriate check box(es) from the following options:

- Baseline (B) - parameters measured before administration of test chemical
- Concurrent (C) - run simultaneously with the exposure
- Historical (H) - data collected often during a long-term survey of the area
- Multiple (M) - multiple type of controls reported, noted individually
- Other (O) - control is run in a different system than exposures
- Positive (P) - an exposure that causes a desired effect in the experiment
- Solvent (V) - exposed to carrier or solvent only
- Undefined (K) - control is presented but without accompanying methodology

Historical ECOTOX Control Types

- Insufficient (I) - not enough information presented to determine control type
- Multiple Controls (OK) - multiple type of controls reported
- Satisfactory (S) - run in the same system, low mortality
- Unsatisfactory (U) - chemical entered control, high mortality

Control Not Reported

- No Control Used (Z) - author state no control used
- Not Coded (NC) - was not coded
- Not Reported (NR) - was not reported

Chemical Analysis

The method of chemical analysis filters test records based on the author reported chemical concentrations as measured or nominal values. Individual chemical analysis types may be selected by choosing the appropriate check box(es) 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.

Search by Publication Options

Publication Year(s)

The default within the ECOTOX Knowledgebase is that all data, regardless of publication year, are included in search result. The default publication year search may be overridden by selecting a range of publication years

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.

Author(s)

Searches may be conducted on specific authors. To search on an author, enter the specific author names in the selection box while in the ‘All Publication Options’ of the Search Page, one author per line followed by a carriage return.

Partial author names may be used.

Only authors which have data encoded in the ECOTOX Knowledgebase are returned.

Reference Number

Each publication abstracted for the ECOTOX Knowledgebase effort is assigned a unique reference number. These reference numbers are available for selection for any ECOTOX outputs. To conduct a search, enter a valid ECOTOX reference number(s) in the selection box in the “Ref Num” box, with one reference number per line.

Independently Compiled Data

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 Knowledgebase. 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. The default may be overridden and restrict search to only data sets checked in your selection box.

Recent Modifications and Additions

The default within ECOTOX is that all data, regardless of the date they were added to ECOTOX, are included in your search result. You may restrict 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 for specific queries (e.g., list of species and/or chemicals) conducted on a regular basis.

You can select “View All Applied” box to view the selected parameters used in the Search Function. This information can be exported to retain a dated record of each search.

Output and Report Format Options

Within Search the output table report has been condensed to include only the most utilized output fields. All or some of the coded fields can be exported by first selecting “Change Display Fields” button, then click on “Select All” or clicking on any additional fields to display in search results. All updated fields will be displayed in the output table.

Navigating within Output table**:** 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. To view all coded output fields, scroll down to bottom and then scroll to right of table. To move from one page to another page of the report, use the numbered hyperlinks located at bottom of each report page.

Users can also choose to export data to an Excel spreadsheet or delimited file. The report will be saved as either Aquatic or Terrestrial depending on selected output. The current report has been condensed to include only the most utilized output fields. All or some of the coded fields can be exported by first selecting “Change Display Fields” button, then click on “Select All” or clicking on any additional fields to display in search results

In the downloaded/saved Excel report, if the author did not report data for a database field, the output report will display NR (not reported). Definitions for any codes presented in the report can be found in the “ECOTOX Coding Appendix” located under the “Help” tab.

Note: To print a report, you must first export output to Excel or delimited file. You cannot print directly from the HTML output.

Delimited Output

This option allows you to generate an ASCII delimited data file of your search results. The delimited tabular output format has set default output fields. If the author did not report data for a 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 Appendix located in the Help section under the Home page.

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).

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. Comment fields can be selected in output to help interpret unique test conditions but for a complete understanding of the toxicity study, refer to the full publication.

Display Fields

Select data parameters are presented in the default versions of the aquatic and terrestrial tabular reports A checkmark appears in data fields that are displayed in the default output format. You can change the display fields for MS Excel, and delimited outputs by selecting the “Change Display Fields” to add additional output fields then and “Update Search”. To remove a selected data field, click on the checked box. Click on the “View All Applied” to see modified entries. Full Data Record outputs cannot be modified.

USING THE “EXPLORE” FUNCTION TO LOCATE DATA

About Explore

The Explore Function is a great tool for searching the ECOTOX Knowledgebase if you do not know the exact parameters you want to search, or would like a visual representation of general and specific data trends. It is an interactive way to examine search paths by chemical, species and effects. There are ways to examine the data visually via plotting functions.

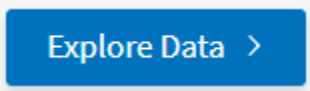
Explore by Chemical

Predefined Chemical Groups

The option to select from predefined lists is available in the ‘Explore’ function. Chemical lists have been provided to effectively search a variety of Metal/Organometal or Organic

compounds chemical groups. To select a chemical group or group(s) of interest, click on the check box you want to search. To unselect, click on the checkbox again.

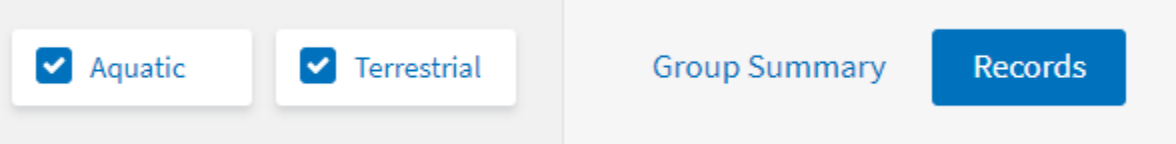
Searches for data on specific “custom group” of chemicals can also be conducted from the Explore chemical page.You cannot select both a chemical from the group list and also enter in a custom group chemical. After specific group is selected, click on “Explore Data” button



The default within the ECOTOX Knowledgebase is that all chemicals in the selected group are selected for searching. If you want to limit results to specific chemical in that group, output can be refined by filtering Tabular data using boxes at top of table, or by using the Query filters on the left side of table.

Notice that initial output has both Aquatic and Terrestrial data reported under the Group Summary tab. You can deselect one or the other by clicking on checkbox to filter data.

You can zero in on available data results by selecting “Records” tab at top of table which will show all Distinct records in the Group:



Note: While searching for data using the Explore feature, you will notice less output columns as compared to Search function (currently 6 under Group summary and 9 under Records). To see all available data for specific results, you must apply the search parameters using the Search function of the Knowledgebase.

Refining/Filtering data using Query filters

You can refine tabular data using filters on left side of table. All chemicals, species, effects, etc data present from initial search can be refined via the dropdown boxes under each filter group. You may select one or multiple options in each box. Once filters are selected, click enter or outside the box to apply to data output table. You can select “View All Applied” box to view the selected parameters. This information can be exported to retain a dated record of each search.

Data Visualization Plots

Data output presented in the Explore table can also be plotted (if applicable). Currently, only Aquatic data or Terrestrial data that can be converted to ppm is viewable in

Explore. There are three types of plots available: Effect by Chemical, Duration by Chemical and Duration by Endpoint.

The Data presented in the table or in the plot can be further refined using either the Query filters on the left side of the webpage, or via the headers in the output table. Users can also “zoom’ in to the plot to refine output, or by deselecting/selecting items in plot legend.

Hovering cursor over any of the data points in the graph will highlight the study. If you click on any data point in the plot, it will highlight the result in the table below the plot.

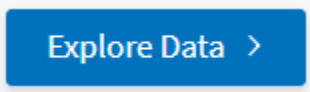
Notice in the Explore plot table, only 13 output columns are shown. To see all available data for specific results, you must apply the search parameters using the Search function of the Knowledgebase.

Explore by Species

Predefined Species Groups

The option to select from predefined lists is available in the ‘Explore’ function. Species groups have been provided to effectively search a variety of Animal, Plants, or Special interest groups. To select one or many species group(s) of interest, click on the check box(es) you want to search. To unselect, click on the checkbox again.

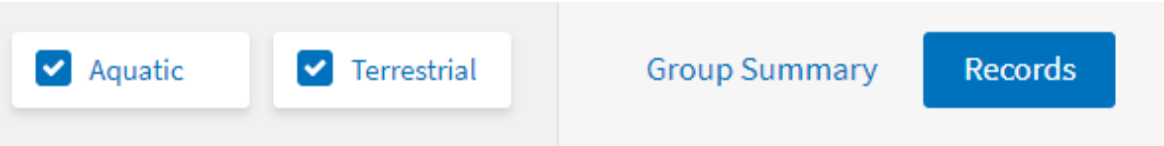
After specific group is selected, click on “Explore Data” button



The default within the ECOTOX Knowledgebase is that all species in the selected group are selected for searching. If you want to limit results to specific species in that group, output can be refined by filtering Tabular data using boxes at top of table, or by using the Query filters on the left side of table.

Notice that initial output has both Aquatic and Terrestrial data reported under the Group Summary tab (if applicable). You can deselect one or the other by clicking on checkbox to filter data.

You can zero in on available data results by selecting “Records” tab at top of table which will show all Distinct records in the Group:



Note: While searching for data using the Explore feature, you will notice less output columns as compared to Search function (currently 6 under Group summary and 9 under Records). To see all available data for specific results, you must apply the search parameters using the Search function of the Knowledgebase.

Refining/Filtering data using Query filters

You can refine tabular data using filters on left side of table. All chemicals, species, effects, etc data present from initial search can be refined via the dropdown boxes under each filter group. You may select one or multiple options in each box. Once filters are selected, click enter or outside the box to apply to data output table. You can select “View All Applied” box to view the selected parameters. This information can be exported to retain a dated record of each search.

Data Visualization Plots

Data output presented in the Explore table can also be plotted (if applicable). Currently, only Aquatic data or Terrestrial data that can be converted to ppm is viewable in Explore. There are three types of plots available: Effect by Chemical, Duration by Chemical and Duration by Endpoint.

The Data presented in the table or in the plot can be further refined using either the Query filters on the left side of the webpage, or via the headers in the output table. Users can also “zoom’ in to the plot to refine output, or by deselecting/selecting items in plot legend.

Hovering cursor over any of the data points in the graph will highlight the study. If you click on any data point in the plot, it will highlight the result in the table below the plot.

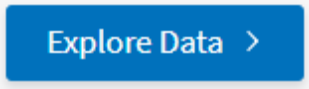
Notice in the Explore plot table, only 13 output columns are shown. To see all available data for specific results, you must apply the search parameters using the Search function of the Knowledgebase.

Explore by Effects

Predefined Effects Groups

The option to select from predefined lists is available in the ‘Explore’ function. Effects groups have been provided to effectively search a variety of typical apical effects such as Growth, Reproduction and Mortality, but also include newer effects groups such as Behavior and Physiology effects. To select one or many species group(s) of interest, click on the check box(es) you want to search. To unselect, click on the checkbox again.

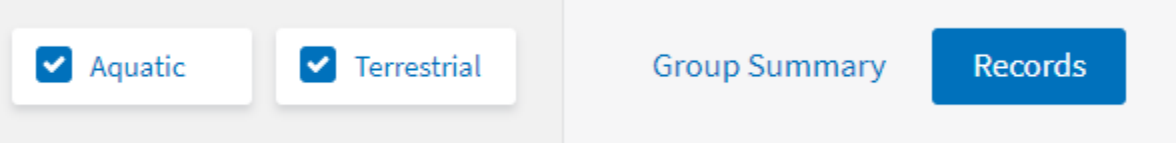
After specific group is selected, click on “Explore Data” button



The default within the ECOTOX Knowledgebase is that all effects in the selected group are selected for searching. If you want to limit results to specific effect measurement in that group, output can be refined by filtering Tabular data using boxes at top of table, or by using the Query filters on the left side of table.

Notice that initial output has both Aquatic and Terrestrial data reported under the Group Summary tab (if applicable). You can deselect one or the other by clicking on checkbox to filter data.

You can zero in on available data results by selecting “Records” tab at top of table which will show all Distinct records in the Group:



Any specific Effect on the output table can be selected for viewing by clicking on green arrow on right side of output table This will refine output table to all records by selected effect.

Note: While searching for data using the Explore feature, you will notice less output columns as compared to Search function (currently 6 under Group summary and 9 under Records). To see all available data for specific results, you must apply the search parameters using the Search function of the Knowledgebase.

Refining/Filtering data using Query filters

You can refine tabular data using filters on left side of table. All chemicals, species, effects, etc data present from initial search can be refined via the dropdown boxes under each filter group. You may select one or multiple options in each box. Once filters are selected, click enter or outside the box to apply to data output table. You can select “View All Applied” box to view the selected parameters. This information can be exported to retain a dated record of each search.

Data Visualization Plots

Data output presented in the Explore table can also be plotted (if applicable). Currently, only Aquatic data or Terrestrial data that can be converted to ppm is viewable in Explore. There are three types of plots available: Effect by Chemical, Duration by Chemical and Duration by Endpoint.

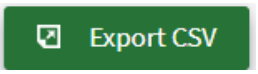
The Data presented in the table or in the plot can be further refined using either the Query filters on the left side of the webpage, or via the headers in the output table.

Users can also “zoom’ in to the plot to refine output, or by deselecting/selecting items in plot legend.

Hovering the cursor over any of the data points in the graph will highlight the study. If you click on any data point in the plot, it will highlight the result in the table below the plot.

Notice in the Explore plot table, only 13 output columns are shown. To see all available data for specific results, you must apply the search parameters using the Search function of the Knowledgebase

Exporting Data in Explore

Tabular data output can be exported to CSV file by clicking on 

button and saving file to computer.

PERFORM QUERY USING SEARCH OR EXPLORE FUNCTION

View Applied Parameters

Before conducting a search using your search criteria, you may want to review your search strategy. Click on the “View All Applied” button at the bottom of the parameter selections. This option can only be done once the search has been ran. For documentation purposes, you may want to print the “View All Applied” information and attach it to the reports that are generated using the search criteria.

Restore Defaults

The Reset All button on the search page will clear the search criteria and restore the report format to its original default selections. The Clear All button on the Explore page will clear the search criteria and restore to its original default selections.

Perform Query on Aquatic Data or Terrestrial Data

Click the “Aquatic” or “Terrestrial” button when you are ready to initiate your search strategy and create a report/output, and click the “Update Search” button. When the search is complete, the appropriate results (report contents or data file name) for aquatic or terrestrial report(s) will appear. Information about how to retrieve your output will display:

- 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 Knowledgebase window to refine your search strategy.

Once you have completed your search, and closed the report window, you will be returned to the ECOTOX Knowledgebase 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 ‘Reset All’ button.

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.

Chemicals

Chemical Names	CAS Numbers	Predefined Groups	
		Metal Compounds	**Organic Compounds**
		Aluminum	Conazoles
		Antimony	DDT and metabolites
		Barium	Dibenzofurans
		Beryllium	Endocrine Disrupting Chemicals (EDC)
		Cadmium	Glycol Ethers
		Chromium	Nitrosamines
		Cobalt	Phthalate Esters
		Copper	Polyaromatic Hydrocarbons (PAH)
		Iron	Polychlorinated Biphenyls (PCB)
		Lead	Polybrominated Diphenyl Ethers (PBDE)
		Manganese	Pharmaceutical Personal Care (PPCP)
		Mercury	Explosives
		Nickel	Major Ions
		Organotin	Neonicotinoids
		Selenium	Perchlorates
		Silver	Perfluorooctane Sulfonates/Acids
		Vanadium	-- (PFAS/PFOS)
		Zinc	
		Arsenic	

Species

Scientific Names/ Taxonomic Levels	Common Names	Species Numbers	Predefined Taxonomic Groups
			All Animals
			Amphibians
			Insects/Spiders
			Molluscs
			Birds
			Other Invertebrates
			Reptiles
			Crustaceans
			Mammals
			Worms
			Fish
			All Plants
			Algae, Moss, Fungi
			Flowers, Trees, Shrubs, Ferns
			Special Interest
			Standard Test Species
			US Threatened/Endangered Species
			US Exotic/Nuisance

Test Results

Endpoints: _____

Effect Groups:

___Accumulation ___Mortality

___Behavior ___Physiology

___Biochemical ___Population

___Cellular ___Reproduction

___Growth ___Ecosystem

___Specific Effect Measurements_____

_____Include Delayed Effects

Test Conditions

Test Location(s):

____ Lab _____All Field Tests
____ Field Artificial
____ Field Natural
_____ Field Undeterminable

Exposure Media:

WATER: ___Freshwater_____Saltwater __ Unknown
SOIL: __ Artificial ___ Humus Litter ___Manure ___Mineral Soil _____Natural Soil
___Unspecified Soil ____Mixture
ARTIFICIAL: ___Hydroponic ____Other

Exposure Type:

__ Diet
__ Injection
__ Topical
__ Environmental
__ Multiple Entry
__ In-vitro
__Not Reported
__ Flow-through (aquatic)
__ Leaching (aquatic)
__Intermittent (aquatic)
__ Renewal (aquatic)
__ Lotic (aquatic)
_____Static (aquatic)
__ Lentic (outdoor aquatic)
___ Tidal (outdoor aquatic)

Control Type:

__ Concurrent
__ Multiple
__ Baseline
__ Solvent
__ Positive
__ Historical
__ Undefined
__ Other
__ Insufficient
__ Multiple Controls
__ Satisfactory
__ Unsatisfactory
__ No Control
_____Not Coded
____ Not Reported

Chemical Analysis: _____Measured_____Unmeasured ___Not Reported

Publications

Publication Years: _____

Author: _____

Reference Number(s):_____

Independently Compiled Data:

_____EPA: Fathead Minnow Acute Toxicity

_____ EPA: Office of Pesticide Program Database

_____ Dutch Dataset:

_____ French Dataset:

_____ German Dataset:

_____ Russian Dataset:

_____ USGS Acute Toxicity Dataset:

Update Dates: _____

Report Output

Aquatic Output Elements Standard default output elements are listed in **bold**. Some output options are available for Field Data only, and are indicated by (Field Only).	Terrestrial Output Elements Standard default output elements are in **bold**. Some output options are available for Field Data only, and are indicated by (Field Only).
___ Alkalinity	___ Application Date (field only)
___ Application Date (field only)	___ Application Date /Season (field only)
___ Application Date /Season (field only)	___ Application Frequency
___ Application Frequency	___ Application Rate (field only)
___ Application Rate (field only)	___ Application Type (field only)
___ Application Type (field only)	___ Author
___ Author	___ **CAS Number/ Chemical Name**
___ BCF Value	___ **Chemical Analysis Method**
___ Calcium	___ Chemical Carrier
___ CAS Number	___ Chemical Comment
___ **CAS Number/ Chemical Name**	___ Chemical Formulation
___ Chemical Analysis	___ **Chemical Grade**
___ Chemical Carrier	___ Chemical Half Life (field only)
___ Chemical Comments	___ Chemical Purity
___ Chemical Formulation	___ Chemical Radiolabel
___ **Chemical Grade**	___ Control Type
___ Chemical Half Life (field only)	___ **Dose (Author)**
___ **Chemical Purity**	___ **Dose Number**
___ Chemical Radiolabel	___ Dose Statistical Method
___ Chlorine	___ Doses
___ Concentration (Author)	___ EE Comment
___ **Concentration (Standardized)**	___ **Effect**
___ Conductivity	___ Effect %
___ Control	___ Effect Measurement
___ Dissolved Inorganic Carbon	___ **Endpoint**
___ Dissolved Oxygen	___ Endpoint Assignment
___ Doses	___ Endpoint BCF/BAF
___ EE Comment	___ Experimental Design
___ Effect	___ Exposure Comment
___ Effect %	___ Exposure Duration (Author)
___ Effect Measurement	___ Exposure Duration (Days)
___ **Effect /Effect Measurement**	___ Exposure Sample Number
___ **Endpoint**	___ **Exposure Type**
___ Endpoint Assignment	___ Exposure Type/Chemical Analysis method
___ Endpoint BCF value	___ Gender
___ Experimental Design	___ General comments
___ Exposure Duration (Author)	___ Geographic Code (Field Data Only)
___ Exposure Duration (Days)	___ Geographic Location (Field Data Only)
___ Exposure Sample Number	___ Habitat
___ Exposure Type	___ Habitat Code (Field only)
___ **Exposure Type/Chemical Analysis method**	___ Habitat Comment (Field only)
___ Gender	___ Intake Rate
___ General comments	___ Ionic Fraction
___ Geographic Code (Field Data Only)	___ Longitude/Latitude (Field Data Only)
___ Geographic Location (Field Data Only)	___ Media Cation Exchange Capacity
___ Habitat	___ Media Measurement
___ Habitat Code (Field only)	___ Media Moisture
___ Habitat Comment (Field only)	___ Media Organic Matter and Type
___ Hardness	___ **Media Type**
___ Humic Acid	___ Media Type/Test Location
___ Intake Rate	___ Observed Duration (Author)
___ Ionic Fraction	___ **Observed Duration (Days)**
___ Longitude/Latitude (Field Data Only)	___ Observed Response BCF/BAF
___ Magnesium	___ **Organism Age**
___ Media Type	___ Organism Comment
___ Media Type/Test Location	___ Organism Initial Weight
___ Number of Doses	___ **Organism Lifestage**
___ Number of Doses/Result Sample Unit	___ Organism Source
___ Observed Duration (Author)	___ Other Effects

___ **Observed Duration (Days)**
___ Observed Response BCF/BAF
___ **Organism Age**
___ Organism Comment
___ Organism Initial Weight
___ **Organism Lifestage**
___ Organism Source
___ Other Effects
___ pH
___ Potassium
___ Publication Year
___ **Reference Citation**
___ Reference Number
___ **Response Site**
___ Response Site/Exposure Duration (Days)
___ Result Percent Dry/Wet Weight
___ Result Comment
___ Result Percent Lipid
___ Result Sample Number/Unit
___ Result Sample Number
___ Result Sample Unit
___ Salinity
___ Season
___ Significance Level
___ Significance Level/Statistical Significance
___ Sodium
___ Species Common Name
___ Species ECOTOX Number
___ Species Final Weight
___ **Species Group**
___ Species NCBI TaxID
___ Species Scientific Name
___ **Species Scientific Name/Species Common Name**
___ Species Taxonomic Information
___ Statistical Significance
___ Steady State
___ Study Duration (Author)
___ Study Duration (Days)
___ Study Type
___ Substrate Code (Field only)
___Substrate Comment (Field only
___ Sulfate
___ Sulfur
___ Temperature
___ Test Location
___ Test Method
___ Test Number
___ Test Type
___ Trend
___ Trend/Effect %
___ Water Depth

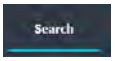
___ Publication Year
___ **Reference Citation**
___ Reference Number
___ **Response Site**
___ Response Site/Exposure Duration (Days)
___ Result Percent Dry/Wet Weight
___ Result Comment
___ Result Percent Lipid
___ Result Sample Number/Unit
___ Result Sample Number
___ Result Sample Unit
___ Significance Level
___ Significance Level/Statistical Significance
___ Soil Clay %
___ Soil Dose Measured
___ Soil pH
___ Soil Sand %
___ Soil Silt %
___ Soil Type
___ Species Common Name
___ Species ECOTOX Number
___ Species Final Weight
___ **Species Group**
___ Species NCBI TaxID
___ Species Scientific Name
___ **Species Scientific Name/Species Common Name**
___ Species Taxonomic Information
___ Statistical Significance
___ Steady State
___ Study Duration (Author)
___ Study Duration (Days)
___ Study Type
___ Substrate Code (Field only)
___Substrate Comment (Field only)
___ Temperature
___ Test Comments
___ **Test Location**
___ Test Method
___ Test Number
___ Test Type
___ Trend
___ Trend/Effect %

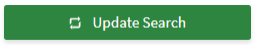
APPENDIX B: PRACTICE SEARCHES

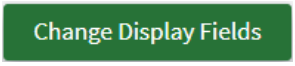
These examples are for you to try in the 'Search' Page. After each example search, remember to click on "Reset All" before proceeding to the next search.

Example A

You want to locate All Reproductive effects data for Nickel compounds. You want to include the specific *Reproductive effects measured.*

1. From home page (https://cfpub.epa.gov/ecotox), click on search: 

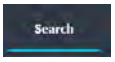
2. Click on "All Chemicals" from the menu. Scroll down to "Any Chemical Group".
3. Select **Nickel** checkbox from the metal compound list.
4. Click on "All Effects" from the menu. Select **Reproduction Group**.
5. Select Update Search 

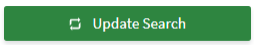
6. For Aquatic data display, click on "Change Display Fields" 

in the upper right hand. Scroll down and click on the **EE COMMENT** checkbox to add this field to your output. Then click '**Save'**. (Note: The Terrestrial default full data will display the specific measurement in the report.) Scroll to the right to see this Display field added to the output table.
7. Click on the **Aquatic** button for aquatic data. Click on the **Terrestrial** button for terrestrial data.

Example B

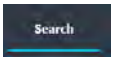
You want to locate LC50 data on Freshwater organisms exposed to Malathion.

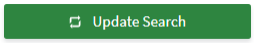
1. From Home page (https://cfpub.epa.gov/ecotox), click on search: 

2. Click the "All Chemicals" menu on the left frame of the Search page. Type in CAS Number '**121755'** or '**Malathion'** in the Chemical entry selection box.
3. Click "All Endpoints" menu. Within the "Concentration Based Endpoint" menu, select '**LC50'** checkbox.
4. Click "All Test Conditions" menu. Scroll down to the "Exposure Media" selection box and click on the **Fresh Water** checkbox.
5. Click on update search button. 

Example C

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

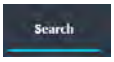
1. From home page (https://cfpub.epa.gov/ecotox), click on search: 

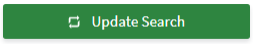
2. Click “All Species” menu on the left frame of the Search page. Type in “**Daphnia magna**’ and confirm that the **Genus/Species Name** radio button is highlighted.
3. Click on the “All Effects” menu and select the ‘**Mortality Group’** checkbox.
4. Click on the All Publication Options” menu. Within the “Publication Years” selection box, select **2010** from the first drop down list and select **2018** from the second drop down list.
5. Click on update search button. 

6. Note: Only ‘Aquatic’ data should be presented in the table.

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. From home page (https://cfpub.epa.gov/ecotox), click on search: 

2. Click on the “All Species” menu on the left frame of the Search page. Scroll down to the “Any Species Groups” and check the ‘**Amphibians’** checkbox.
3. Click on the “All Test Conditions” menu. Within the “Any Test Locations” area, select the checkbox ‘**All Field Tests’** from the list. Also, within the “Exposure Media - Water” select “**Fresh**’, **‘Salt’** and ‘**Not Specified’**.
4. Click on the **Terrestrial** button. (Selecting ‘Aquatic’ will return too many to view, but if desired, you could select additional filters to refine output)
5. Click on Update Search. 

6. Click “Export As…” button. Choose either ‘Excel’ or ‘delimited’ report option for the results.

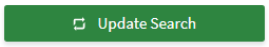
ADDITIONAL SEARCH and EXPLORE EXAMPLES

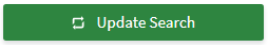
After each example, remember to click on “Reset All” before proceeding to the next example.

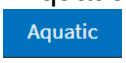
I. Search Example

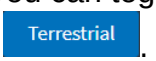
You want to locate all reproductive effects data for Buprofezin. What types of reproductive effects were measured?

1. From the ECOTOX home page, click ‘Search’ on the top banner.

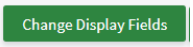
2. Select the ‘All Chemicals’ tab from the left frame.
3. Type “Buprofezin” into the chemical name search box, and click the green 

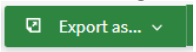
button. You should get `109 results.
4. Select the ‘All Effects’ tab from the left frame and scroll down to ‘Reproduction Group’
5. Deselect the checkbox next to ‘Any Measurements’ and/or just select the checkbox next to ‘Reproduction Group’ then 

6. Select the **‘Aquatic’** button for aquatic data or ‘**Terrestrial**’ button for terrestrial data. The data fields and display format is different for an **aquatic exposure** versus a **terrestrial exposure**. If you would like to view data for both Aquatic and Terrestrial you can toggle between the two by select either ‘Aquatic’ 

or ‘Terrestrial’ 

.
7. Click the blue ‘View All Applied’ button to view/export Search parameters applied.

8. Select green ‘Change Display Fields’ to change by selecting additional data fields in to be shown in the displayed and downloaded table. 

9. Select ‘References’ tab in upper right to see list of references for the results from this search.
10. Click the green ‘Export as…’ drop-down to select type of file to download. 

NOTE: Please confirm that what you select/deselect makes sense in the database. If you have selected “Reproduction“ and “Avian-Reptilian Egg” you should NOT be seeing **any other Effects** in your report. Also, if you are viewing **AQUATIC** Tab in the Results table, you should not be able to see any Amphibian species under the Results table.

Conversely if you are viewing the **TERRESTRIAL** table, there should only be TERR organisms listed (here 59), but you can also go back to ALL SPECIES and select smaller group of results, such as WORMS.

If you are seeing anything that you feel may be in error or “bugs”, please “View All Applied” and Copy/Save, and send the information to Ecotox.support@epa.gov .

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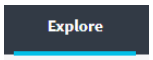
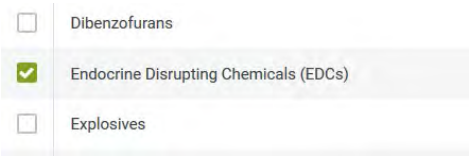
The second example is using the EXPLORE tab on the homepage of the database. You might use this when you are not sure of what type of chemical information or species are in contained in the knowledgebase.

II. Explore Example

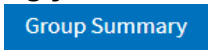
You want to Explore data on the Reproductive effects of Endocrine Disrupting Chemicals (EDCs) in fish.

1. From the ECOTOX home page, click 'Explore' on the top banner. 

2. Click the 'Chemicals' icon.
3. From the 36 Chemical groups listed, scroll down to select **'Endocrine Disrupting Chemicals (EDCs)**' checkbox.



4. Click the blue 'Explore Data' button to begin exploring.

5. You should see ~169 chemicals listed by CAS number. You can browse this list by CAS, or Chemical name, or number of publications just by typing in the column header. To Remove this filter, just hit X Reset in upper RED BAR.
6. To view information on specific CAS number listed in output table, click the green '>' (greater than) sign and all the Aquatic and Terrestrial Records for that chemical will be displayed. You can filter additionally by Aquatic or Terrestrial by deselecting one or the other. Note: Depending on number of Records, the output may be limited to the first 3,000.
7. If you want to go back to your original list of 169 chemicals, you must go back to 'Query Filters' on left hand side, and reset to "All Chemicals" by selecting then clicking Enter or moving off box. **Using the browser Back key or closing out the EDC tab above, will bring you all the way back to the Home page**. You can then Select Group summary 

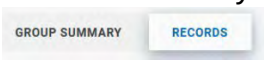
to see original list .
8. From the list of 'Query filters', click the drop down 'Species Group' selection box and select **Fish.** If you wish to select multiple species groups, hold the 'ctrl' key and click on multiple selections. Click outside of the 'Species Group' drop down menu or click enter on your keyboard to apply new parameters.

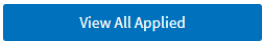
Notice now that above 'Query Filters', the **Terrestrial** box is no longer highlighted due to the selection of 'Fish' (Aquatic organism) as your species of interest.

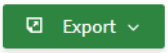
You can continue to refine the output by *Effect:*

9. From the drop down 'Effect Groups' selection box. Scroll down to Select 'Reproduction'. Again, click outside of the dropdown menu or click Enter on your

keyboard to apply new parameters. Your search should return ~63 chemicals in the output list.

10. On the top left corner of the page, above additional 'Query Filters', ensure that only the **Aquatic** checkbox is selected.
11. The data matching your Explore criteria will automatically display in the Group Summary view. You can switch to view records individually by clicking the 'Records' button located under the top banner. 

12. In this example, we have 395 Distinct Records for All EDCs on Fish showing Reproduction effects.
13. You can again filter or refine your Table view by typing in a filter in the header (ie "LOEC" under Endpoint) which will reduce the number of Records to 99 (red bar). Note: If you export to CSV file from here, you will only get this subset of records, not all 395.
14. To "Explore with Visualization", click on the 'Plot' tab in the upper right.
15. There are 3 interactive figures to display ECOTOX Records which have exposure concentrations (standardized to an equivalent of ppm (parts per million)).
    Note: Zoom in by drawing rectangle around area of interest. Turn Chemicals or Endpoints off and on by clicking on name in legend. Hover over points of interest for more information. Click on point to be directed to record in table below the figure.
16. Dur x Chem: Exposure duration (days) on x-axis, Exposure concentration on y-axis, Chemical for point shape and color
17. Dur x Endpt: Exposure duration (days) on x-axis, Exposure concentration on y-axis, Endpoint for point shape and color
18. Effect x Chem: Effect Groups on x-axis, Exposure concentration on y-axis, Chemical for point shape and color
19. Simplified table below each figure shows subset of data for each record.
20. You can continue to refine the output with 'Query Filters' on left hand side.
21. Click the blue 'View All Applied' button to view/export Explore parameters applied.
    

22. Click the green 'Export' button to download figure or simple table. 

    WARNING: Simple table does not include all fields. Return to 'Search' and apply filter parameters to download complete data tables.

APPENDIX C: ECOTOX KNOWLEDGEBASE OVERVIEW

Data Sources

The primary source of toxicity effect information in ECOTOX is from 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 Knowledgebase 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. For various reasons authors may report the same data point in different publications. If the authors themselves cross-reference the data, ECOTOX codes the data only once and notes the cross-reference as part of the bibliographic citation. This type of cross-reference most frequently occurs in the publication of a thesis and subsequent journal articles. If the author does NOT acknowledge multiple publications of a single data point, it is likely this data point will occur in ECOTOX as multiple records, each with a different citation. This type of publication occurs most frequently when data is published in different sources such as a textbook and journal article, an agency publication and a journal article, or a regional journal and an international journal.

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 Knowledgebase component. The key data fields that must be included are: test chemical name, test organism, test duration, effect, and effect concentration or application rate. 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 2009), 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 and 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 or 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 life-stage 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 time period 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 are 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. 2009. *MED Ecotoxicology Database Standard Operating Procedures* (prepared by Computer Sciences Corporation), 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. Searches in ECOTOX can be done using the species synonym name, however, 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:

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.gov . If the taxonomic levels are not available with ITIS, other taxonomic sources are used.

For more information, please refer to the Species Verification Standard Operating Procedure, linked from the ECOTOX Help page under "More Resources."

Predefined Special Interest Sources

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

Standard Test Species References

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

U.S. Fish and Wildlife Service (http://www.fws.gov/endangered/wildlife.html#Species Updated annually).

U.S. Exotic/Nuisance Species References

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.seagrant.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.

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

14) Mortensen, Carol Estes. Is it a wildflower, or is it a weed? Minnesota National Forests, Leech Lake Reservation Division of Resources Management.

15) National Biological Information Infrastructure (2003). Invasive Species Information Node. http://invasivespecies.nbii.gov/downloads/SppListMaster18jun02.xls

16) Rendall, Jay. (1999) Weeds Gone Wild. Minnesota Conservation Volunteer, July-Aug 1999

17) Stratford, Kay & Barbara Doll. Invasive Aquatic and Wetland Plants. Field Guide. North Carolina Sea Grant.

18) The Great Lakes Schoolship, Inland Seas Education Association, Invasive Species Education Program. http://www.schoolship.org/invasivespecies/docs2/K_Invasive_Species_Table.pdf

19) The Nature Conservancy (1996). America's Least Wanted: Alien Species Invasions of U.S. Ecosystems.

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

21) "USGS, Nonindigenous Aquatic Plant Maps and Species Accounts http://nas.er.usgs.gov/plants/sp_accnts.html"

22) USGS: Nonindigenous Aquatic Species. http://nas.er.usgs.gov/

23) USGS: Nonindigenous Mollusk Distribution Information. http://nas.er.usgs.gov/

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

25) Wisconsin Department of Natural Resources (2003). Non-native Plants. http://www.dnr.state.wi.us/org/land/er/invasive/nonative.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 Knowledgebase 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, chemical mixtures and biological toxicants. 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.

For more information, please refer to the Chemical Verification section, linked from the ECOTOX Help page under “ECOTOX Coding Documentation.”

APPENDIX E: ECOTOX DATA FIELD DESCRIPTIONS

All associated codes for these fields are located in the ECOTOX Code Appendix, available linked from the ECOTOX Help page.

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 -The type of source the test organism was obtained

Organism Lifestage - Initial test organism lifestage.

Organism Age - Initial age of the test organism.

Organism Gender – The sex of the organism

Organism Initial Weight – Initial weight of the organism

Organism Final Weight – Weight of the organism at the time of observation

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.

NOTE: 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, the soil parameters in the soil characteristics fields are reported (pH, CEC, OM, etc.). See Appendix L. Exposure Media Codes in the “ECOTOX Code Appendix” found under the Help section of the website for more information.

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 (Field U). 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 (Field N) 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 (Field A). 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 Field A and Field N, then use the code Field U 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 - Time period 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 instances, 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 or duration that is converted to a standard unit (days).

Study Duration

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 instance, 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 author's 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 or duration that is converted to a standard unit (days).

Exposure Type

Aquatic - Exposures must either be aqueous, through diet, or by injection

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 database 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).

Habitat

For Terrestrial studies, the habitat as noted by the author, either soil or non-soil. Aquatic studies are all in water (aqua).

Chemical Analysis

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

Application Frequency

Author reported frequency of dosing application

Study Type

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

Test Type

Author reported Test Type for the toxicity study (e.g. ACUTE, CHRONIC, ELS (Early Life Stage), FLC (Full Life Cycle), or Generational).

Test Method

Denotes the test methodology used for the study, e.g. U.S.EPA or OECD guideline.

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., replicates run, death of control organisms), but rather documents author reported controls.

Number of Doses

The total number of exposure doses, including the control(s), for each independent test design.

Doses

For all aquatic reports and terrestrial *browser viewable*, the individual doses used in the study are summarized here.

For terrestrial delimited or Excel reports, this data field reports that dose at which the response was measured.

Experimental Design

Contains any ‘Additional’ study information, such as 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 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 were used.

Exposure Sample Number

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

Gender

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

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 Knowledgebase 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

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

This field contains additional endpoint and/or effect text as described by the author.

Effect %

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 terminologies 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

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 x 106), 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

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

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 (<=) 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 (Dose Response only)

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

Result Statistical Method (Dose Response 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 ()

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 ()

Percent lipid in the whole organism or response site

Other Effects

Comments regarding other toxicity tests or effects reported in the publication that does 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

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 reported by author.

Calcium – Expressed as reported by author

Chlorine – Expressed as reported by author

Conductivity - Expressed as reported by author

Dissolved Inorganic Carbon – Expressed as reported by author **Dissolved Oxygen** - Expressed as reported by author. A "SAT" code denotes 100% saturation.

Hardness - Expressed as reported by author. If the author only reports the terms "hard" or "soft", these terms are recorded

Humic Acid – Expressed as reported by author

Organic Carbon Type and Value - Expressed as reported by author as Carbon. (T= total, P= Particulate, D= Dissolved)

pH - pH value

Potassium – Expressed as reported by author

Salinity - Expressed as reported by author

Sodium – Expressed as reported by author

Sulfate – Expressed as reported by author

Sulfur – Expressed as reported by author

Temperature - Expressed as reported by author

Outdoor Test Fields

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.

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

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

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

Result Comment

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)

Temperature - Expressed as reported by author.

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 is 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 is 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, it 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, this moisture percentage is coded and denoted 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 or wet 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 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, data, institution address and contacts are listed below:

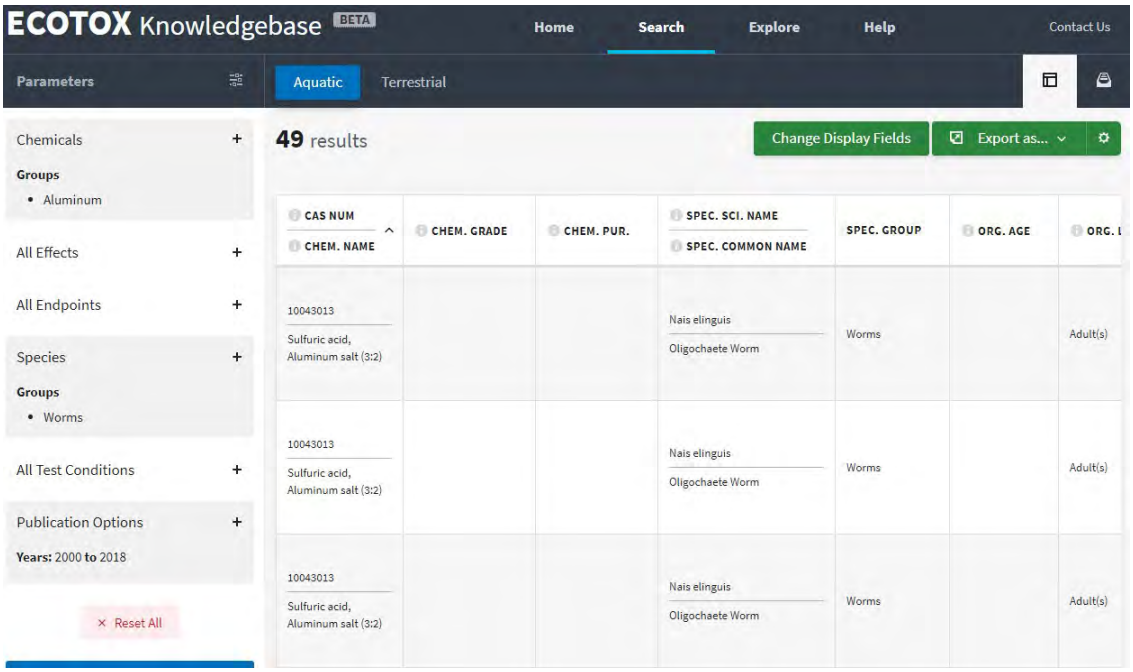
Institution Contact Information	Data Summary and Reference Numbers
EPA: Fathead Minnow Acute Toxicity Database (MED) **To obtain hard copies of the University of Wisconsin-Superior (UWS) volumes contact:** University of Wisconsin/ Lake Superior Research Institute PO Box 2000 Superior, WI 54880 Contact: Matt TenEyck E-mail: MTenEyck@uwsuper.edu Phone: 715-394-8160 **For technical information on the database contact:** U.S. EPA/ORD/NHEERL/MED Contact: Colleen Elonen E-mail: elonen.colleen@epa.gov	5 references (#3217, 12447, 12448, 12858, 12859); 730 aquatic records
French (OECD-IRCHA) 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	13 references (#20, 3397, 3516, 3517, 3518, 3519, 3520, 3521, 5161, 6771, 9170, 10724, 15300); 256 aquatic records

Institution Contact Information	Data Summary and Reference Numbers
German (OECD) 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 http://webetox.uba.de/webETOX/public/search/test/open.do Contact: Dieter Schudoma Telefon: (+49-30) 8903 4225 Fax: (+49-30) 8903 4233 Email: ETOX@uba.de	282 references (citation refers to OECDG Database); 8218 aquatic records 941 terrestrial records
Dutch (OECD) National Institute of Public Health and Environmental Protection (RIVM/ACT) PO Box 1, 3720 BA Bilthoven The Netherlands http://rivm.nl/en/ Contact: Charles Bodar E-mail: charles.bodar@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, Yaroslavsky Region Russian Republic http://www.ibiw.ru/ Contact: Victor Komov E-mail: vkomov@ibiw.yaroslavl.ru	55 references 255 aquatic records

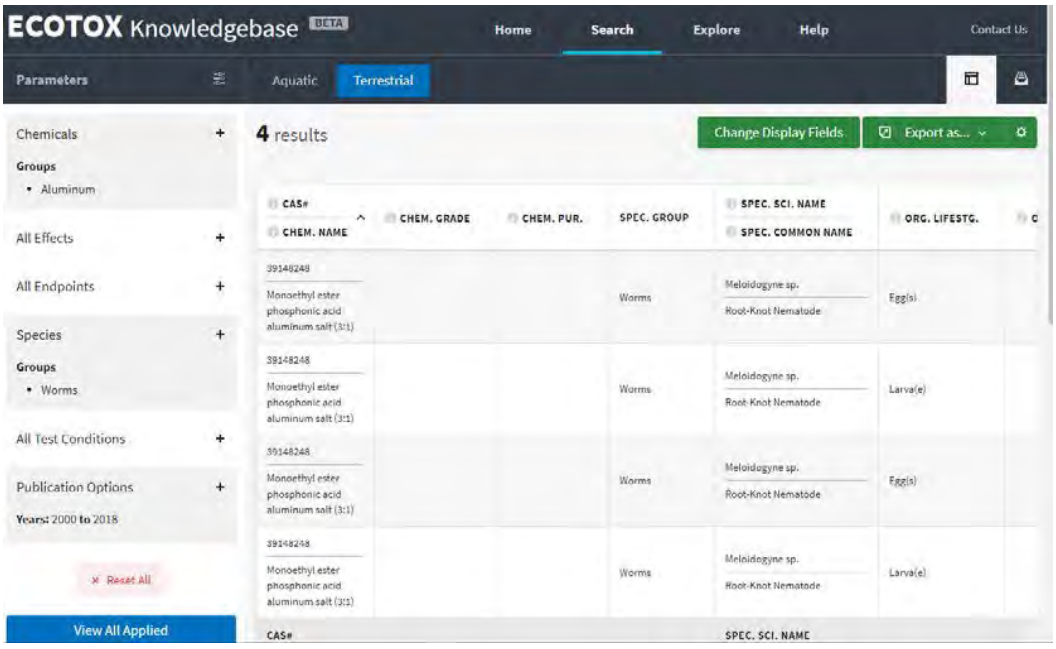
Institution Contact Information	Data Summary and Reference Numbers
EPA: Office of Pesticides Program Database (OPP) (Pesticide Ecotoxicity Database -formerly Ecological Effects Database) U.S. Environmental Protection Agency Office of Pesticide Programs Environmental Fate and Effects Division, Ecological 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”) 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	1 reference (#6797); 8761 aquatic records

APPENDIX G: DEFAULT REPORT FORMATS

Aquatic Results Viewable Report



Terrestrial Results Viewable Report



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	Freshwater/Saltwater Exposure Media
GRADE	Chemical Grade
HAB	Habitat Description
HALF	Half Life
HARD	Hardness
HMA	Humic Acid Value and Unit

Header Abbreviation	Associated Field Name
In EE Comment	Endpt (Endpoint)
In EE Comment	Measurement
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

Header Abbreviation	Associated Field Name
SULF	Sulfur Value and Unit
TEMP	Temperature
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

Header Abbreviations	Associated Field Name
EFCT%	Effect Percent
ENDPT	Endpoint Assigned
ETIME	Exposure Duration
FO	Chemical Formulation
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

Header Abbreviations	Associated Field Name
STIME	Study Duration
STST	Steady State
STYPE	Study Type
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 (>, >=, <. =<, =)

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	Alkalinity Units
Appl. Date	Application Date	Application Date
Appl. Freq. (7 fields)	Application Frequency Mean Op	Application Frequency Mean Operator
	Application Frequency Mean	Application Frequency Mean Value
	Application Frequency Min Op	Application Frequency Minimum Operator
	Application Frequency Min	Application Frequency Minimum Value
	Application Frequency Max Op	Application Frequency Maximum Operator
	Application Frequency Max	Application Frequency Maximum Value
	Application Frequency Units	Application Frequency Units
Appl. Rate (2 fields)	Application Rate Application Units	Application Rate Application Units
Appl. Seas.	Application Season	Application Season
Appl. Type	Application Type	Application Type
Author	Author	Author

Report Header	Delimited File Header Name	Header Name Definition
BCF (1 fields) Note: The Concentration Type determines the fraction measured in BCF1 and BCF 2.	BCF1 Value Op	First Bioconcentration Factor Mean Operator
	BCF1Value	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
	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
	BCF3 Value Op	Third Bioconcentration Factor Mean Operator
	BCF3 Value	Third Bioconcentration Factor Mean
	BCF3 Min Op	Third Bioconcentration Factor Minimum Operator
	BCF3 Min	Third Bioconcentration Factor Minimum Value
	BCF3 Max Op	Third Bioconcentration Factor Maximum Operator
	BCF3 Max	Third Bioconcentration Factor Maximum Value
Calcium (7 fields)	Calcium Mean Op	Calcium Mean Operator
	Calcium Mean	Calcium Mean Value

Report Header	Delimited File Header Name	Header Name Definition
	Calcium Min Op	Calcium Minimum Operator
	Calcium Min	Calcium Minimum Value
	Calcium Max Op	Calcium Maximum Operator
	Calcium Max	Calcium Maximum Value
	Calcium Units	Calcium Units
CAS #	CAS Number	Test Chemical Abstract Services Registry Number
Chem. 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	Chemical Comment	Test Chemical Comment
Chem. Form.	Chemical Formulation	Chemical Formulation
Chem. Grade	Chemical Grade	Chemical Grade
Chem. Half Life (7 fields)	Chemical Half Life Mean OP	Chemical Half Life Mean Operator
	Chemical Half Life Mean	Chemical Half Life Mean
	Half Life Min OP	Half Life Minimum Operator
	Half Life Min	Half Life Minimum
	Half Life MaxOP	Half Life Maximum Operator
	Half Life Max	Half Life Maximum
	Half Life Unit	Half Life Unit
Chemical	Chemical Name	Chemical Name
Chem. Pur. (6 Fields)	Chemical Purity Mean OP	Chemical Purity Mean Operator
	Chemical Purity Mean	Chemical Purity Mean
	Chemical Purity Min OP	Chemical Purity Minimum Operator
	Chemical Purity Min	Chemical Purity Minimum
	Chemical Purity Max OP	Chemical Purity Maximum Operator
	Chemical Purity Max	Chemical Purity Maximum
Chem. Radiolabel	Chemical Radiolabel	Chemical Radiolabel
Chlorine	Chlorine Mean OP	Chlorine Mean Operator
	Chlorine Mean	Chlorine Mean

Report Header	Delimited File Header Name	Header Name Definition
	Chlorine Min OP	Chlorine Minimum Operator
	Chlorine Min	Chlorine Minimum
	Chlorine Max OP	Chlorine Maximum Operator
	Chlorine Max	Chlorine Max
	Chlorine Unit	Chlorine Unit
Conc (48 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)
	Concentration1 Max	First Concentration Maximum Value (Author) or (ug/L)
	Concentration Type1	First Concentration Type (Author) or (ug/L)
	Concentration2 Mean Op	Third Concentration Mean Operator (Author) or (ug/L)
	Concentration2 Mean	Third Concentration Mean Value (Author) or (ug/L)
	Concentration2 Min Op	Third Concentration Minimum (Author) or (ug/L) Operator
	Concentration2 Min	Third Concentration Minimum Value
	Concentration2 Max Op	Third Concentration Maximum Operator (Author) or (ug/L)
	Concentration2 Max	Third Concentration Maximum Value (Author) or (ug/L)
	Concentration Type 2	Third Concentration Type (Author) or (ug/L)
	Concentration3 Mean Op	Third Concentration Mean Operator (Author) or (ug/L)
	Concentration3 Mean	Third Concentration Mean Value (Author) or (ug/L)
	Concentration3 Min Op	Third Concentration Minimum (Author) or (ug/L) Operator

Report Header	Delimited File Header Name	Header Name Definition
	Concentration3 Min	Third Concentration Minimum Value
	Concentration3 Max Op	Third Concentration Maximum Operator (Author) or (ug/L)
	Concentration3 Max	Third Concentration Maximum Value (Author) or (ug/L)
	Concentration Type 3	Third Concentration Type (Author) or (ug/L)
	Concentration Units	Author or ug/L
Control	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 Max	Conductivity Maximum Value
	Conductivity Units	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 Max	Dissolved Oxygen Maximum Value
	Dissolved Oxygen Units	Dissolved Oxygen Units
Dissolved Inorganic Carbon (7 fields)	Dissolved Inorganic Carbon Mean Op	Dissolved Inorganic Carbon Mean Operator
	Dissolved Inorganic Carbon Mean	Dissolved Inorganic Carbon Mean Value
	Dissolved Inorganic Carbon Min Op	Dissolved Inorganic Carbon Minimum Operator
	Dissolved Inorganic Carbon Min	Dissolved Inorganic Carbon Minimum Value
	Dissolved Inorganic Carbon Max Op	Dissolved Inorganic Carbon Maximum Operator

Report Header	Delimited File Header Name	Header Name Definition
	Dissolved Inorganic Carbon Maximum	Dissolved Inorganic Carbon Maximum Value
	Dissolved Inorganic Carbon Units	Dissolved Inorganic Carbon Units
Effect	Effect	Effect
Effect Meas.	Effect Measurement	Effect Measurement
Eff. % (6 fields)	Effect Percent Mean Op	Effect Percent Mean Value Operator
	Effect Percent Mean	Effect Percent Mean Value
	Effect Percent Min Op	Effect Percent Minimum Value Operator
	Effect Percent Min	Effect Percent Minimum Value
	Effect Percent Max Op	Effect Percent Maximum Value Operator
	Effect Percent Max	Effect Percent Maximum Value
Endpoint	Endpoint	Endpoint
Endpoint Assign.	Endpoint Assignment	Endpoint Assignment
EE Comment	EE Comment	Effect Endpoint (EE) Comment
Exp. Design	Experimental Design	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	Exposure Duration Units
Exposure Sample Number	Exposure Sample Number	Exposure Sample Number
Exp. Type	Exposure Type	Exposure Type
General Comments	General Comments	General Comments
Geog. Loc	Geographic Location	Geographic Location
Geog. Code	Geographic Code	Geographic Code
Gender	Gender	Gender
Habitat	Habitat	Habitat Code
Habitat Code	Habitat Code	Habitat Code
Habitat Comment	Habitat Comment	Habitat Comment

Report Header	Delimited File Header Name	Header Name Definition
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	Hardness Units
Humic Acid (mg/L)(7 fields)	Humic Acid Mean Op	Humic Acid Mean Operator
	Humic Acid Mean	Humic Acid Mean Value
	Humic Acid Min Op	Humic Acid Minimum Operator
	Humic Acid Min	Humic Acid Minimum Value
	Humic Acid Max Op	Humic Acid Maximum Operator
	Humic Acid Maximum	Humic Acid Maximum Value
	Humic Acid Units	Humic Acid Units
Intake Rate (7 Fields)	Intake Rate Mean Op	Intake Rate Mean Operator
	Intake Rate Mean	Intake Rate Mean Value
	Intake Rate Min Op	Intake Rate Minimum Operator
	Intake Rate Min	Intake Rate Minimum Value
	Intake Rate Max Op	Intake Rate Maximum Operator
	Intake Rate Maximum	Intake Rate Maximum Value
	Intake Rate Units	Intake Rate Units
Ion (3 fields)	Ionic Fraction1 Ionic Fraction2 Ionic Fraction3	Ionic Fraction1 Ionic Fraction2 Ionic Fraction3
Lat/Long	Latitude/Longitude	Latitude/Longitude
Magnesium (mg/L)(7 fields)	Magnesium Mean Op	Magnesium Mean Operator
	Magnesium Mean	Magnesium Mean Value
	Magnesium Min Op	Magnesium Minimum Operator
	Magnesium Min	Magnesium Minimum Value
	Magnesium Max Op	Magnesium Maximum Operator
	Magnesium Maximum	Magnesium Maximum Value
	Magnesium Units	Magnesium Units

Report Header	Delimited File Header Name	Header Name Definition
Media Type	Media Type	Media Type
Number of Doses	Number of Doses	Number of Doses
Obs. Dur. (14 fields) (Author) or (Days)	Observed Duration Op	Observed Duration Operator
	Observed Duration	Observed Duration Value
	Observed Duration Min Op	Observed Duration Minimum Operator
	Observed Duration Min	Observed Duration Minimum Value
	Observed Duration Max Op	Observed Duration Maximum Operator
	Observed Duration Max	Observed Duration Maximum Value
	Observed Duration Units	Observed Duration Units
Org. Carb. Type Value (8 fields)	Organic Carbon Mean Op	Organic Carbon Mean Operator
	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
	Organic Carbon Units	Organic Carbon Units
	Organic Carbon Type	Organic Carbon Type
Org. Age (7 fields)	Organism Age Mean Op	Organism Age Mean Operator
	Organism Age Mean	Organism Age Mean
	Organism Age Min Op	Organism Age Minimum Operator
	Organism Age Min	Organism Age Minimum
	Organism Age Max Op	Organism Age Maximum Operator
	Organism Age Max	Organism Age Maximum
	Organism Age Units	Organism Age Units
Org. Comment	Organism Comment	Organism Comment
Species Final Weight	Species Final Weight Mean Op	Species Final Weight Mean Operator
	Species Final Weight Mean	Species Final Weight Mean
	Species Final Weight Min Op	Species Final Weight Minimum Operator

Report Header	Delimited File Header Name	Header Name Definition
	Species Final Weight Min	Species Final Weight Minimum
	Species Final Weight Max Op	Species Final Weight Maximum Operator
	Species Final Weight Max	Species Final Weight Maximum
	Species Final Weight Units	Species Final Weight Units
Organism Initial Weight	Organism Initial Weight Mean Op	Organism Initial Weight Mean Operator
	Organism Initial Weight Mean	Organism Initial Weight Mean
	Organism Initial Weight Min Op	Organism Initial Weight Minimum Operator
	Organism Initial Weight Min	Organism Initial Weight Minimum
	Organism Initial Weight Max Op	Organism Initial Weight Maximum Operator
	Organism Initial Weight Max	Organism Initial Weight Max
	Organism Initial Weight Units	Organism Initial Weight Units
Org. Lifestg.	Organism Lifestage	Organism Lifestage
Organism Source	Organism Source	Organism Source
Other Effects	Other Effects	Other Effects
pH (6 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
Potassium (7 Fields)	Potassium Mean Op	Potassium Mean Operator
	Potassium Mean	Potassium Mean Value
	Potassium Min Op	Potassium Minimum Operator
	Potassium Min	Potassium Minimum Value
	Potassium Max Op	Potassium Maximum Operator
	Potassium Maximum	Potassium Maximum Value
	Potassium Unit	Potassium Unit
Pub. Year	Publication Year	Publication Year
Ref #	Reference Number	Reference Number

Report Header	Delimited File Header Name	Header Name Definition
Reference Citation (4 fields)	Author Title Publication Year Source	Author Title Publication Year Source
Resp. Site	Response Site	Response Site
Result Comment	Result Comment	
Result Percent Lipid (6 Fields)	Result Percent Lipid Mean Op	Result Percent Lipid Mean Operator
	Result Percent Lipid Mean	Result Percent Lipid Mean Value
	Result Percent Lipid Min Op	Result Percent Lipid Minimum Operator
	Result Percent Lipid Min	Result Percent Lipid Minimum Value
	Result Percent Lipid Max Op	Result Percent Lipid Maximum Operator
	Result Percent Lipid Maximum	Result Percent Lipid Maximum Value
Result Number	Result Number	
Result Sample Number	Result Sample Number Mean Op	Result Sample Number Mean Operator
	Result Sample Number Mean	Result Sample Number Mean Value
	Result Sample Number Min Op	Result Sample Number Minimum Operator
	Result Sample Number Min	Result Sample Number Minimum Value
	Result Sample Number Max Op	Result Sample Number Maximum Operator
	Result Sample Number Maximum	Result Sample Number Maximum Value
	Result Sample Number Unit	Result Sample Number Unit
Result Percent Dry/Wet Weight	Result Percent Dry/Wet Weight Mean Op	Result Percent Dry/Wet Weight Mean Operator
	Result Percent Dry/Wet Weight Mean	Result Percent Dry/Wet Weight Mean Value
	Result Percent Dry/Wet Weight Min Op	Result Percent Dry/Wet Weight Minimum Operator
	Result Percent Dry/Wet Weight Min	Result Percent Dry/Wet Weight Minimum Value
	Result Percent Dry/Wet Weight Max Op	Result Percent Dry/Wet Weight Maximum Operator
	Result Percent Dry/Wet Weight Maximum	Result Percent Dry/Wet Weight Maximum Value

Report Header	Delimited File Header Name	Header Name Definition
	Result Percent Dry/Wet Weight Unit	Result Percent Dry/Wet Weight Unit
Salin. (7 fields)	Salinity Mean Op	Salinity Mean Operator
	Salinity Mean	Salinity Mean Value
	Salinity Min Op	Salinity Minimum Operator
	Salinity Min	Salinity Minimum Value
	Salinity Max Op	Salinity Maximum Operator
	Salinity Max	Salinity Maximum Value
	Salinity Units	Salinity Units
Seas.	Season	
Sig. Level	Significance Level Mean Op	Significance Level Mean Operator
	Significance Level Mean	Significance Level Mean Value
	Significance Level Min Op	Significance Level Minimum Operator
	Significance Level Min	Significance Level Minimum Value
	Significance Level Max Op	Significance Level Maximum Operator
	Significance Level Max	Significance Level Maximum Value
Sodium	Sodium Mean Op	Sodium Mean Operator
	Sodium Mean	Sodium Mean Value
	Sodium Min Op	Sodium Minimum Operator
	Sodium Min	Sodium Minimum Value
	Sodium Max Op	Sodium Maximum Operator
	Sodium Max	Sodium Maximum Value
	Sodium Unit	Sodium Unit
Spec. Common Name	Species Common Name	Species Common Name
Spec. Sci. Name	Species Scientific Name	Species Scientific Name
Stat. Signif.	Statistical Significance	Statistical Significance
Species Taxon Info. (8 fields)	Species Kingdom	Species Kingdom
	Species Phylum	Species Phylum
	Species Subphylum	Species Subphylum
	Species Superclass	Species Superclass
	Species Class	Species Class

Report Header	Delimited File Header Name	Header Name Definition
	Species Genus Species	Species Genus Species
	Species Variety	Species Variety
Spec. #	Species Number	Species Number
Steady State	Steady State	
Study Duration. (14 fields) (Author) or (Days)	Study Duration Op	Study Duration Operator
	Study Duration	Study Duration Value
	Study Duration Min Op	Study Duration Minimum Operator
	Study Duration Min	Study Duration Minimum Value
	Study Duration Max Op	Study Duration Maximum Operator
	Study Duration Max	Study Duration Maximum Value
	Study Duration Units	Study Duration Units
Study Type	Study Type	Study Type
Substr. Code	Substrate Code	Substrate Code
Substr. Comments	Substrate Comments	Substrate Comments
Sulfate	Sulfate Mean Op	Sulfate Mean Operator
	Sulfate Mean	Sulfate Mean Value
	Sulfate Min Op	Sulfate Minimum Operator
	Sulfate Min	Sulfate Minimum Value
	Sulfate Max Op	Sulfate Maximum Operator
	Sulfate Max	Sulfate Maximum Value
	Sulfate Unit	Sulfate Unit
Sulfur	Sulfur Mean Op	Sulfur Mean Operator
	Sulfur Mean	Sulfur Mean Value
	Sulfur Min Op	Sulfur Minimum Operator
	Sulfur Min	Sulfur Minimum Value
	Sulfur Max Op	Sulfur Maximum Operator
	Sulfur Max	Sulfur Maximum Value
	Sulfur Unit	Sulfur Unit
Temp. (7 fields)	Temperature Mean Op	Temperature Mean Operator
	Temperature Mean	Temperature Mean Value
	Temperature Min Op	Temperature Minimum Operator

Report Header	Delimited File Header Name	Header Name Definition
	Temperature Min	Temperature Minimum Value
	Temperature Max Op	Temperature Maximum Operator
	Temperature Max	Temperature Maximum Value
	Temperature Units	Temperature Units
Test #	Test Number	Test Number
Test Locaction	Test Location	Test Location
Test Method	Test Method	Test Method
Test Type	Test Type	Test Type
Title	Title	Title of the Publication
Trend	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
	Water Depth Max	Water Depth Maximum Value
	Water Depth Units	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 (>, >=, <. =<, =)

Report Header	Delimited File Header Name	Delimited Header Definition
Appl. Date	Application Date	
Appl. Freq. (7 fields)	Application Frequency Mean Op	Application Frequency Mean Operator
	Application Frequency Mean	Application Frequency Mean Value
	Application Frequency Min Op	Application Frequency Minimum Operator
	Application Frequency Min	Application Frequency Minimum Value
	Application Frequency Max Op	Application Frequency Maximum Operator

Report Header	Delimited File Header Name	Delimited Header Definition
	Application Frequency Max	Application Frequency Maximum Value
	Application Frequency Units	Application Frequency Units
Appl. Rate (2 fields)	Application Rate Application Units	Application Rate Application Units
Appl. Seas.	Application Season	Application Season
Appl. Type	Application Type	Application Type
Author	Author	
BCF/BAF ** BCF/BAF values are located in “Observed Response Value” field in the Excel/Delimited reports**	BCF1 Value Op	Bioconcentration Factor Mean Operator
	BCF1Value	Bioconcentration Factor Mean Value
	BCF1 Min Op	Bioconcentration Factor Minimum Operator
	BCF1 Min	Bioconcentration Factor Minimum Value
	BCF1 Max Op	Bioconcentration Factor Maximum Operator
	BCF1 Max	Bioconcentration Factor Maximum Value
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	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
Chem. Half Life (7 fields)	Chemical Half Life Mean OP	Chemical Half Life Mean Operator

Report Header	Delimited File Header Name	Delimited Header Definition
	Chemical Half Life Mean	Chemical Half Life Mean
	Chemical Half Life Min Op	Chemical Half Life Minimum Operator
	Chemical Half Life Min	Chemical Half Life Minimum
	Chemical Half Life Max Op	Chemical Half Life Maximum Operator
	Chemical Half Life Max	Chemical Half Life Maximum
	Chemical Half Life Unit	Chemical Half Life Unit
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
	Dose Statistical Method	Dose Statistical Method
	Dose Value Op	Dose Statistical Method Operator
	Dose Value	Dose Statistical Method Value
	Dose Units	Dose Units
Control	Control	Control
Dose #	Dose Number	Dose Number
EE Comment	EE Comment	Effect Endpoint (EE) Comment
Effect	Effect	Effect
Effect Meas.	Effect Measurement	Effect Measurement
Eff. % (6 fields)	Effect Percent Mean Op	Effect Percent Mean Value Operator
	Effect Percent Mean	Effect Percent Mean Value
	Effect Percent Min Op	Effect Percent Minimum Value Operator
	Effect Percent Min	Effect Percent Minimum Value
	Effect Percent Max Op	Effect Percent Maximum Value Operator
	Effect Percent Max	Effect Percent Maximum Value
Endpoint	Endpoint	Endpoint
Endpoint Assign.	Endpoint Assignment	Endpoint Assignment
Experimental Design	Experimental Design	Experimental Design Comment
Exp. Type	Exposure Type	Exposure Type

Report Header	Delimited File Header Name	Delimited Header Definition
Exposure Comment	Exposure Comment	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 # (7 fields)	Exposure Sample Number Mean Op	Exposure Sample Number Mean Operator (Author) or (Days)
	Exposure Sample Number Mean	Exposure Sample Number Mean Value (Author) or (Days)
	Exposure Sample Number Min Op	Exposure Sample Number Minimum Operator (Author) or (Days)
	Exposure Sample Number Min	Exposure Sample Number Minimum Value (Author) or (Days)
	Exposure Sample Number Max Op	Exposure Sample Number Maximum Operator (Author) or (Days)
	Exposure Sample Number Max	Exposure Sample Number Maximum Value (Author) or (Days)
Gender	Gender	Gender
Gen. Comments	General Comments	General Comments
Geog. Loc	Geographic Location	Geographic Location
Geog. Code	Geographic Code	Geographic Code
Habitat	Habitat	Habitat
Habitat Code	Habitat Code	Habitat Code
Habitat Comment	Habitat Comment	Habitat Comment
Intake Rate (7 Fields)	Intake Rate Mean Op	Intake Rate Mean Operator
	Intake Rate Mean	Intake Rate Mean Value
	Intake Rate Min Op	Intake Rate Minimum Operator

Report Header	Delimited File Header Name	Delimited Header Definition
	Intake Rate Min	Intake Rate Minimum Value
	Intake Rate Max Op	Intake Rate Maximum Operator
	Intake Rate Maximum	Intake Rate Maximum Value
	Intake Rate Units	Intake Rate Units
Ion	Ionic Fraction	Ionic Fraction
Lat/Long	Latitude/Longitude	Latitude/Longitude
Media Meas. Wet/Dry	Media Measurement (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
	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. Mat. (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

Report Header	Delimited File Header Name	Delimited Header Definition
	Media Organic Matter Units	Media Organic Matter Units
Media Type	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)
<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	Observed Response Units
Org. Comment	Organism Comment	Organism Comment
Org. Age (7 fields)	Organism Age Mean OP	Organism Age Mean Operator
	Organism Age Mean	Organism Age Mean
	Organism Age Min OP	Organism Age Minimum Operator
	Organism Age Min	Organism Age Minimum
	Organism Age Max OP	Organism Age Maximum Operator
	Organism Age Max	Organism Age Maximum
	Organism Age Units	Organism Age Units
Org. Comment	Organism Comment	Organism Comment

Report Header	Delimited File Header Name	Delimited Header Definition
Org. Init. Wt.	Organism Initial Weight Mean OP	Organism Initial Weight Mean Operator
	Organism Initial Weight Mean	Organism Initial Weight Mean
	Organism Initial Weight Min OP	Organism Initial Weight Minimum Operator
	Organism Initial Weight Min	Organism Initial Weight Minimum
	Organism Initial Weight Max OP	Organism Initial Weight Maximum Operator
	Organism Initial Weight Max	Organism Initial Weight Maximum
	Organism Initial Weight Units	Organism Initial Weight Units
Org. Lifestg.	Organism Lifestage	Organism Lifestage
Org. Source	Organism Source	Organism Source
Other Effects	Other Effects	Other Effects
Ref. #	Reference Number	Reference Number
Reference Citation (2 fields, author, year) Click on “References” to obtain full citation	Author Title Year Source	Author Title Year Source
Resp. Site	Response Site	Response Site
Result Comment	Result Comment	Result Comment
Result % Dry/Wet Weight	Result Percent Dry/Wet Weight	Result Percent Dry/Wet Weight
Result % Lipid	Result Percent Lipid	Result Percent Lipid
Result Rec. Num.	Result Record Number	Result Record 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	Result Sample Number
<Not available in Tabular Report>	Result Sample Unit	Result Sample Unit
Sig. Level	Significance 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

Report Header	Delimited File Header Name	Delimited Header Definition
	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	Soil Type
Source	Source	Bibliographic Source
Spec. Common Name	Species Common Name	
Org. Final Wt	Species Final Weight Mean Op	Species Final Weight Mean Operator
	Species Final Weight Mean	Species Final Weight Mean
	Species Final Weight Min Op	Species Final Weight Minimum Operator
	Species Final Weight Min	Species Final Weight Minimum
	Species Final Weight Max Op	Species Final Weight Maximum Operator
	Species Final Weight Max	Species Final Weight Maximum
	Species Final Weight Units	Species Final Weight Units

Report Header	Delimited File Header Name	Delimited Header Definition
Species Group	Species Group	Species Group
Species Taxon. Info. (8 fields)	Species Kingdom	Species Kingdom
	Species Phylum	Species Phylum
	Species Subphylum	Species Subphylum
	Species Superclass	Species Superclass
	Species Class	Species Class
	Species Genus Species	Species Genus Species
	Species Variety	Species Variety
Spec. #	Species Number	Species Number
Spec. Sci. Name	Species Scientific Name	Species Scientific Name
Signif.	Statistical Significance	Statistical Significance
Steady State	Steady State	Steady State
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)
Test Comments	Test Comment	Test Comment
Test Loc.	Test Location	Test Location
Test #	Test Number	Test Number
Test Method	Test Method	Test Method
Test Type	Test Type	Test Type
Trend	Trend	Trend
Title	Title	Title of Publication
Pub. Year	Year	Publication Year