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SECONDARY VALUES FOR ETHYLBENZENE (CAS # 100-41-4)

A search was conducted for information on the toxicity of ethylbenzene to fish and other aquatic life using the ECOTOX database. It was determined that data are available to meet four out of the eight requirements. Because there are data for a Daphnid species, it is possible to calculate a secondary acute value for ethylbenzene.

The Fox River and the East River are each designated as a warm water sportfish community, non-public water supply. However, it is necessary to calculate secondary values for both cold water and warm water first, for comparative purposes. If the secondary values are lower for warm water than for cold water, then the secondary values for cold water (complete database) will apply for the warm water. If the secondary values for warm water are higher than for cold water, then the secondary values for warm water will apply. Secondary values for cold water should also be calculated because the site is located just upstream of where the Fox River enters Green Bay, and Green Bay is designated cold water, public water supply.

Cold Water

To calculate a secondary acute value (SAV), the lowest genus mean acute value (GMAV) in the database is divided by the secondary acute factor (SAF; an adjustment factor corresponding to the number of satisfied requirements).

SAF for four out of eight requirements met = 7.0

Lowest GMAV = 2,643.57 μg/L (*Daphnia magna*)

SAV = GMAV/SAF
= 2,643.57/7.0
= 377.65 μg/L

There are currently no acceptable chronic data for ethylbenzene. Therefore, a secondary chronic value may be calculated only by using default acute-chronic ratios.

SACR = Geometric mean of 18, 18, and 18 = 18

SCV = SAV/SACR
= 377.65/18
= **20.98 μg/L**

So, for cold water, the secondary acute value for ethylbenzene is 378 μg/L (rounded from 377.65) and the secondary chronic value is 21 μg/L (rounded from 20.98).

Warm Water Sportfish

The rainbow trout drop out of the database when calculating secondary values for warm water. However, because the lowest GMAV for cold water was the GMAV for *Daphnia magna*, which is also in the warm water sportfish database, the secondary values for warm water sportfish will be the same as those for cold water.

Table 1. Requirements for calculation of an acute toxicity criterion for protection of aquatic life for toluene, and corresponding acute toxicity data.

Species Name	Common Name	Duration/ Endpoint	Value µg/L	Reference #[a]	Source
1. At least one salmonid fish in the family Salmonidae, in the class Osteichthyes.					
Oncorhynchus mykiss	**rainbow trout**	**96-h/LC50**	**14,000**	**4**	**AQUIRE**
Oncorhynchus mykiss	**rainbow trout**	**96-h/LC50**	**4,200**	**7**	**AQUIRE**
Oncorhynchus mykiss	**rainbow trout**	**96-h/LC50**	**14,000**	**5**	**AQUIRE**
SMAV = 9,372.06					
2. At least one non-salmonid fish from another family in the class Osteichthyes, preferably a commercially or recreationally important warmwater species.					
Ictalurus punctatus	**channel catfish**	**96-h/LC50**	**210,000**	**4**	**AQUIRE**
Ictalurus punctatus	**channel catfish**	**96-h/LC50**	**210,000**	**5**	**AQUIRE**
SMAV = 210,000					
Lepomis macrochirus	**bluegill**	**96-h/LC50**	**32,000**	**1**	**AQUIRE**
Lepomis macrochirus	**bluegill**	**96-h/LC50**	**150,000**	**6**	**AQUIRE**
Lepomis macrochirus	**bluegill**	**96-h/LC50**	**88,000**	**4**	**AQUIRE**
Lepomis macrochirus	**bluegill**	**96-h/LC50**	**88,000**	**5**	**AQUIRE**
Lepomis macrochirus	**bluegill**	**96-h/LC50**	**84,000**	**5**	**AQUIRE**
Lepomis macrochirus	**bluegill**	**96-h/LC50**	**140,000**	**5**	**AQUIRE**
Lepomis macrochirus	**bluegill**	**96-h/LC50**	**56,000**	**5**	**AQUIRE**
Lepomis macrochirus	**bluegill**	**96-h/LC50**	**86,000**	**5**	**AQUIRE**
Lepomis macrochirus	**bluegill**	**96-h/LC50**	**285,000**	**5**	**AQUIRE**
Lepomis macrochirus	**bluegill**	**96-h/LC50**	**135,000**	**5**	**AQUIRE**
Lepomis macrochirus	**bluegill**	**96-h/LC50**	**134,000**	**5**	**AQUIRE**
Lepomis macrochirus	**bluegill**	**96-h/LC50**	**80,000**	**5**	**AQUIRE**
Lepomis macrochirus	**bluegill**	**96-h/LC50**	**135,000**	**5**	**AQUIRE**
SMAV = 101,229.78					

3. At least one planktonic crustacean (e.g., cladoceran, copepod).

Daphnia magna	**water flea**	**48-h/EC50**	**2,123**	**2**	**AQUIRE**
Daphnia magna	**water flea**	**48-h/EC50**	**2,970**	**3**	**AQUIRE**
Daphnia magna	**water flea**	**48-h/EC50**	**2,930**	**3**	**AQUIRE**

SMAV = 2,643.57

4. At least one benthic crustacean (e.g., ostracod, isopod, amphipod, crayfish).

5. At least one insect (e.g., mayfly, dragonfly, damselfly, stonefly, caddisfly, mosquito, midge).

6. At least one fish or amphibian from a family in the phylum Chordata not already represented in one of the other subdivisions.

Carassius auratus	**goldfish**	**96-h/LC50**	**94,440**	**1**	**AQUIRE**

SMAV = 94,440

Pimephales promelas	**fathead minnow**	**96-h/LC50**	**9,090**	**8**	**AQUIRE**
Pimephales promelas	**fathead minnow**	**96-h/LC50**	**48,510**	**1**	**AQUIRE**
Pimephales promelas	**fathead minnow**	**96-h/LC50**	**42,330**	**1**	**AQUIRE**
Pimephales promelas	**fathead minnow**	**96-h/LC50**	**12,100**	**9**	**AQUIRE**

SMAV = 21,800.04

7. At least one organism from a family in a phylum other than Arthropoda or Chordata (e.g., Rotifera, Annelida, Mollusca).

8. At least one organism from a family in any order of insect or any other phylum not already represented in subdivisions 1 through 7.

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