

Page 1 SUMMARY

A. Chemical: Chlorobenzene CAS# 108907 Date Dec. 1989

B. Minnesota Criterion: ug/l (unless noted otherwise)

Water Class	Use	CC	MC	FAV	Basis*
1,2A	DW, Salmonid	10	423	846	PCA T2
1,2B,2C	DW, NonSalmonid	10	423	846	PCA T2
2B,2C	NonSalmonid	10	423	846	PCA T2
	Other				

Toxicity related to water quality: No  
 If yes, above criteria values determined for: \_\_\_\_\_  
 Slope: Acute: \_\_\_\_\_ Chronic: \_\_\_\_\_

Formulas: EPA:CC: N/A  
 MPCA: NA MC: \_\_\_\_\_  
 FAV: \_\_\_\_\_

Notes:

C. EPA Criterion: ug/l CCC: \_\_\_\_\_ Basis: \_\_\_\_\_  
 Date: None MC: \_\_\_\_\_ Basis: \_\_\_\_\_  
 FAV: \_\_\_\_\_ Basis: \_\_\_\_\_

Notes:

EPA human health-based criterion, see page 4.

D. Other Criteria: value Source  
 ug/l IJC  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

E. Notes:

\*Criteria basis codes for part B:

- EPA = From EPA criterion
- PCA = Criterion developed by Minnesota Pollution Control Agency staff
- T1 = Direct aquatic life toxicity, EPA national criteria procedures used
- T2 = Direct aquatic life toxicity, EPA advisory procedures used
- Hs = Human health systemic effects
- Hc = Human health carcinogenic effects
- R = Tissue residue (bioaccumulation)
- W = Wildlife effects
- O = Organoleptic (taste and odor)
- Other = Criterion based on other end point

A. Chemical: Chlorobenzene CAS#: 108907 Date: Nov. 1989

B. EPA Criteria Method

- 1. Data requirements: Salmonid: \_\_\_\_\_  
 Family in Phylum Chordata: \_\_\_\_\_  
 Second Family in Phylum Chordata: \_\_\_\_\_  
 Fresh or Saltwater Crustacean: \_\_\_\_\_  
 Freshwater Cladoceran: \_\_\_\_\_  
 Phylum other than Arthropoda or Chordata: \_\_\_\_\_  
 Family not in Phylum Chordata: \_\_\_\_\_  
 Second Family not in Phylum Chordata: \_\_\_\_\_

- 2. GMAVs Lowest 4: \_\_\_\_\_  
 ug/l \_\_\_\_\_  
 N: \_\_\_\_\_

3. FAV: \_\_\_\_\_

4. Adjustments to FAVs: \_\_\_\_\_

5. Chronic data:	83	No. 1	Species: <u>Ambystoma gracile</u>
mean values	<u>10-38</u>	<u>1</u>	<u>Carassius auratus</u>
ug/l	<u>8</u>	<u>1</u>	<u>Micropterus salmoides</u>
	<u>2468</u>	<u>2</u>	<u>Salmo gairdneri</u>
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____

6. ACR Measured:	Acute value	Chronic value	ACR
	<u>4700</u>	<u>2468</u>	<u>1.9</u>
Generic: <u>20, 20</u>	_____	_____	_____
Final: <u>9.1</u>	_____	_____	_____

7. Notes: Log P = 2.86

C. EPA Advisory Method

- 1. Data requirements: Fish: Salmo, Micropterus  
 Crustacean: Daphnia, Mysidopsis, Ceriodaphnia  
 Third animal: Pimephales, Poecilia  
 Plant for herbicide: \_\_\_\_\_  
 Insect for pesticide: \_\_\_\_\_  
 No. SMAVs: 7  
 No. GMAVs: 7  
 Factor: 7.0

2. Lowest GMAV: 5921 Species: Salmo gairdneri

3. FAV: 846 MC: 423

4. Chronic data: See B.5. 5. ACR: See B.6.

D. Criteria

1. FAV: 846 MC: 423 CC: 10

2. Citation for lowest GMAV: 10688, 15457

3. Notes: Chronic criterion lowered to 10 ug/l because of chronic values in range of 8 to 33.

Page 4 HUMAN HEALTH

A. Chemical: Chlorobenzene CAS#: 108907 Date: 11-14-89

B. EPA Human Health Criterion: df: 488 ug/l f: 15,056 d: NA

ADI/Ref.dose: .0144 mg/kg/day slope:
Final BCF: 10.3 %lipid: 3
K: 100 percent

C. Minnesota Human Health Criterion

1. Ref.dose: 0.02 mg/kg/day Source: IRIS MOH
K: 0.2 Source: MPCA

2. Potency slope: NA Source:

Table with 4 columns: Measured BAFs, Species/Tissue, BAF, %lipid, Norm. BAF. Row 1: Gambusia affinis (mosquito fish), 650, 650.

Table with 4 columns: Measured BCFs, Species/Tissue, BCF, %lipid, Norm. BCF. Rows 1-8 are blank.

5. Edible portion BAF or BCF
Cold water: 6.0 % lipid
Warm water: 1.5 % lipid

6. Geo mean unadjusted for lipid: BAF: 650 BCF:

7. log Kow: 2.17 meas. x QSAR Est. BCF:
adjust. for % lipid:

8. Parachor: 243

9. BCF to BAF conversion factor: NA

10. Final BAF: 2A: 650 2B,2C: 650

11. Criteria: df(2A): 13.0 ug/l df(2B,2C): 13.0 f: 14.4 RAL: 300

D. Organoleptic: 20 ug/l Source: EPA

F. Notes:

TABLE 1. CHLOROBENZENE (CONTINUED)

Species Latin Name Species Common Name	Effect	FW/SW	Dur (days)	Ex Ty	R C	Con Typ	Concentration (ug/l) Range	Md	Ref No.
Micropterus salmoides Largemouth bass	LC50	FRESH	6.5	F	2	F	50	M	538
Micropterus salmoides Largemouth bass	LC50	FRESH	6.5	F	2	F	60	M	538
Mysidopsis bahia Mysid shrimp	LC50	SALT		S			16400	U	USEPA, 1978
Pimephales promelas Fathead minnow	LC50	FRESH	1	S	2	F	29120	U	728
Pimephales promelas Fathead minnow	LC50	FRESH	1	S	2	F	33930	U	728
Pimephales promelas Fathead minnow	LC50	FRESH	1	S	2	F	39190	U	728
Pimephales promelas Fathead minnow	LC50	FRESH	2	S	2	F	29120	U	728
Pimephales promelas Fathead minnow	LC50	FRESH	2	S	2	F	33930	U	728
Pimephales promelas Fathead minnow	LC50	FRESH	2	S	2	F	34980	U	728
Pimephales promelas Fathead minnow	LC50	FRESH	4	S	2	F	29120	U	728
Pimephales promelas Fathead minnow	LC50	FRESH	4	S	2	F	33930	U	728
Pimephales promelas Fathead minnow	LC50	FRESH	4	S	2	F	33930	U	728
Pimephales promelas Fathead minnow	LC50	FRESH	4	S	2	F	22300	U	10432
Pimephales promelas Fathead minnow	LC50	FRESH	4	S	2	F	35400	U	10432
Pimephales promelas Fathead minnow	LC50	FRESH	4	S	2	F	22200	U	10432
Poecilia reticulata Guppy	LC50	FRESH	1	S	2	F	45530	U	728
Poecilia reticulata Guppy	LC50	FRESH	2	S	2	F	45530	U	728
Poecilia reticulata Guppy	LC50	FRESH	4	S	2	F	45530	U	728
Salmo gairdneri Rainbow trout, donaldson trout	GR0	FRESH	30	F	2	F	2100	M	15457
Salmo gairdneri Rainbow trout, donaldson trout	LC10	FRESH	EL	F	1	F	36.1	M	15418
Salmo gairdneri Rainbow trout, donaldson trout	LC50	FRESH	2	S	2	F	4100	M	15526
Salmo gairdneri Rainbow trout, donaldson trout	LC50	FRESH	4	F	2	F	4700	M	15457

TABLE 1. CHLOROBENZENE (CONTINUED)

Species Latin Name Species Common Name	Effect	FW/SW	Dur (days)	Ex Ty	R C	Con Typ	Concentration (ug/l) Range	Md	Ref No.
Salmo gairdneri Rainbow trout, donaldson trout	LC50	FRESH	4	F	1	F	7460*	M	10688
Salmo gairdneri Rainbow trout, donaldson trout	LC1 - LC50	FRESH	ELS	F	2	F	<90	M	563
Salmo gairdneri Rainbow trout, donaldson trout	MOR	FRESH	30	F	2	F	>2900	M	15457
Salmo gairdneri Rainbow trout, donaldson trout	LOAEL	FRESH	16 EL	F			90	M	Birge et al., 1979
Scenedesmus quadricauda Green algae	MOR	NR	NR	S	4	F	>390000	U	2463
Scenedesmus quadricauda Green algae	PGR	NR	NR	S	4	F	>390000	U	7453
Scenedesmus quadricauda Green algae	PGR	NR	7	S	2	F	>390000	U	5303
Scenedesmus quadricauda Green algae	PGR	NR	8	S	2	F	>390000	U	15134
Selenastrum capricornutum Green algae	EC50GR	NR	4	S	2	F	12500	M	10745

TABLE 2. CHRONIC VALUES: 108907 CHLOROBENZENE

Species Latin Name	Effect	FW/SW	Dur (days)	Ex Ty	R C	Conc Type	Chronic Value (ug/l)	Md	Ref No.
Ambystoma gracile	LC10	FRESH	EL		1	F		83	M 15418
Carassius auratus	LC1 - LC50	FRESH	EL	F	1	F	110-33 880 - 1040		M 563
Micropterus salmoides	LC1 - LC50	FRESH	EL	F	1	F		2 50	M 563
Salmo gairdneri	MOR	FRESH	30	F	2	F		2900	M 15457
Salmo gairdneri	GRO	FRESH	30	F	2	F		2100	M 15457
Salmo gairdneri	LC10	FRESH	EL		1	F		36	M 15418
<del>Salmo gairdneri</del>	<del>LC1 - LC50</del>	<del>FRESH</del>	<del>EL</del>	<del>F</del>	<del>1</del>	<del>F</del>		<del>&lt;90</del>	<del>M 563</del>

TABLE 2. ACUTE-CHRONIC RATIO: 108907 CHLOROBENZENE

Species Latin Name	Acute Value (ug/l)	Chronic Value (ug/l)	Ratio	Ref
Salmo gairdneri	4700	2468	1.9	15457

TABLE 3a. GENUS MEAN ACUTE VALUES: 108907 CHLOROBENZENE

Species Latin Name	Effect	FW/SW	Dur (days)	Ex Ty	R C	Con Typ	Concentration (ug/l)	Range	SMAV (ug/l)	GMAV (ug/l)	Md	Ref No.
<i>Salmo gairdneri</i>	LC50	FRESH	4	F	1	F	7460*		5921	5921	M	10688
<i>Salmo gairdneri</i>	LC50	FRESH	4	F	2	F	4700				M	15457
<i>Poecilia reticulata</i>	LC50	FRESH	4	S	2	F	45530	45530	45530		U	728
<i>Pimephales promelas</i>	LC50	FRESH	4	S	2	F	22200	28940	28940		U	10432
<i>Pimephales promelas</i>	LC50	FRESH	4	S	2	F	35400				U	10432
<i>Pimephales promelas</i>	LC50	FRESH	4	S	2	F	33930				U	728
<i>Pimephales promelas</i>	LC50	FRESH	4	S	2	F	22300				U	10432
<i>Pimephales promelas</i>	LC50	FRESH	4	S	2	F	29120				U	728
<i>Pimephales promelas</i>	LC50	FRESH	4	S	2	F	33930				U	728
<i>Mysidopsis bahia</i>	LC50	SALT		S			16400	16400	16400		U	USEPA, 1978
<i>Lepomis macrochirus</i>	LC50	FRESH	4	S	2	F	24000	19596	19596		U	728
<i>Lepomis macrochirus</i>	LC50	FRESH	4	S			16000					5590
<i>Daphnia magna</i>	LC50	FRESH	2	S	2	F	86000	10733	10733		U	5184
<i>Daphnia magna</i>	LC50	FRESH	2	S	2	F	10700				U	10810
<i>Daphnia magna</i>	LC50	FRESH	2	S	2	F	8600				U	10810
<i>Daphnia magna</i>	LC50	FRESH	2	S	2	F	12800				U	10810
<i>Daphnia magna</i>	LC50	FRESH	2	S	2	F	11500				U	10810
<i>Daphnia magna</i>	LC50	FRESH	2	S	2	F	12900				U	10810
<i>Daphnia magna</i>	LC50	FRESH	2	S	2	F	15400				U	10810
<i>Daphnia magna</i>	LC50	FRESH	2	S	2	F	13000				U	10810
<i>Daphnia magna</i>	LC50	FRESH	2	S	2	F	21300				U	10810
<i>Daphnia magna</i>	EC50IM	FRESH	2	S	2	F	585				U	10805
<i>Daphnia magna</i>	EC50IM	FRESH	2	S	2	F	5808				U	11926

TABLE 3a. GENUS MEAN ACUTE VALUES: CHLOROBENZENE (continued)

Species Latin Name	Effect	FW/SW	Dur (days)	Ex Ty	R C	Con Typ	Concentration (ug/l) Range	SMAV (ug/l)	GMAV (ug/l)	Md	Ref No.
Ceriodaphnia dubia	LC50	FRESH	2	S	2	F	11400	9935	9935	U	10810
Ceriodaphnia dubia	LC50	FRESH	2	S	2	F	8900			U	10810
Ceriodaphnia dubia	LC50	FRESH	2	S	2	F	11000			U	10810
Ceriodaphnia dubia	LC50	FRESH	2	S	2	F	11100			U	10810
Ceriodaphnia dubia	LC50	FRESH	2	S	2	F	11800			U	10810
Ceriodaphnia dubia	LC50	FRESH	2	S	2	F	7900			U	10810
Ceriodaphnia dubia	LC50	FRESH	2	S	2	F	10400			U	10810
Ceriodaphnia dubia	LC50	FRESH	2	S	2	F	7900			U	10810

TABLE 3b. RANKED GENUS MEAN ACUTE VALUES: 108907 CHLOROBENZENE

Species Latin Name	Effect	FW/SW	Dur (days)	Ex Ty	GMAV (ug/l)
<i>Poecilia reticulata</i>	LC50	FRESH	4	S	45530
<i>Pimephales promelas</i>	LC50	FRESH	4	S	28940
<i>Lepomis macrochirus</i>	LC50	FRESH	4	S	19596
<i>Mysidopsis bahia</i>	LC50	SALT		S	16400
<i>Daphnia magna</i>	LC50	FRESH	2	S	10733
<i>Ceriodaphnia dubia</i>	LC50	FRESH	2	S	9935
<i>Salmo gairdneri</i>	LC50	FRESH	4	F	5921

N: 7  
 Factor: 7  
 FAV: 846

TABLE 4. PLANT VALUES: 108907 CHLOROBENZENE

Species Latin Name	Effect	FW/SW	Dur (days)	Ex Ty	R C	Con Typ	Concentration (ug/l) Range	Md	Ref No.
<i>Anacystis aeruginosa</i>	PGR	NR	8	S	2	F	120000	U	15134
<i>Anacystis aeruginosa</i>	MOR	NR	NR	S	4	F	120000	U	2463
<i>Chilomonas paramecium</i>	PGR	NR	2	NR	4	F	> 195000	U	5719
<i>Entosiphon sulcatum</i>	PGR	NR	3	S	2	F	> 390000	U	5303
<i>Scenedesmus quadricauda</i>	MOR	NR	NR	S	4	F	>390000	U	2463
<i>Scenedesmus quadricauda</i>	PGR	NR	8	S	2	F	> 390000	U	15134
<i>Scenedesmus quadricauda</i>	PGR	NR	NR	S	4	F	>390000	U	7453
<i>Scenedesmus quadricauda</i>	PGR	NR	7	S	2	F	> 390000	U	5303
<i>Selenastrum capricornutum</i>	EC50GR	FRESH	4				12500		15526

Table 5b. BIOCONCENTRATION DATA: 108907 CHLOROBENZENE

Species Latin Name Species Common Name	Effect	Fw/SW	Dur (days)	Ex Ty	R C	BCF or BAF	Percent Tissue Lipid Type	M d.	Ref No.
Gambusia affinis Mosquito fish	BAF	FRESH	2			650			Lu, et al, 1975