Shaugh. No. 114501

FEB - 4 1983

EFB Log Out Date: 2/4/83

Init.: CKO

To: Ed Fite
Ecological Effects Branch, HED (TS-769)

From: Robert Holst
Environmental Fate Branch, HED (TS-769)

Thru: Carolyn K. Offutt Carolyn K. Offutt
Head, Monitoring and Guidelines Section
Environmental Fate Branch, HED (TS-769)

Attached, please find the estimated environmental concentration analysis of:

Reg./File No.: 264-GUG & -GUE

Chemical: Thiodicarb

Type Product: Insecticide

Product Name: Larvin 500 & Larvin 75 WP

Company Name: Union Carbide

Submission Purposes: New use in field and sweet corn

ZBB Code: 3(c)(7)

ACTION CODE:

Date In: 1/22/83

EFB#: EEC #5

Date Completed: 24 JAN 1983

TAIS (Level II) Days

EEC #: #5

35 63 2

IA Purpose:

Ecological Effects Branch requested that EFB calculate an aquatic EEC for thiodicarb (Larvin 500 & 75WP) for its proposed new use in field and sweet corn.

IB Chemical/Physical Characteristics:
See the attached form.

II Directions for Use:
See the attached proposal label amendment.

III Data Discussion:
There were no studies to be reviewed. This is an analysis using existing data. Both a runoff scenario and two aquatic habitats will be examined.

Runoff:

Watersheds in three river basins (Tifton, GA, Yazoo, MS, Coshocton OH) were chosen to determine the possible quantity of thiodicarb in runoff as a function of meteorology and geography. The model river basins are part of the Simulator for Water Resources in Rural Basins (SWRRB). The chemistry and other input data for the pesticide is given in Table 1.

Four applications at the time of silking were determined to occur about 1 July in Ohio and at anytime from early June to late August in Georgia and Mississippi. Applications were made on a 7 to 8 day schedule as per the label directions.

A K_d value of 1 was used even though the value has been reported to vary from 0.58 to 1.34 depending upon the clay content of the soil.

With each application that was followed by a storm within 1 to 5 days, significant pesticide runoff occurred. Quantities reached upwards of 0.100 lb/Acre with values of 0.010 to 0.050 fairly common. Two or three events of this magnitude occur each year and then no more pesticide runoff is predicted to occur.

Water Quality Analysis

From the SWRRB data, a maximum of two runoff quantities 5 days apart (to account for 2 runoff events) were entered into the EXAMS (Exposure Analysis Modeling System) using both the Athens ERL Pond and River scenarios. The chemistry data for thiodicarb used in the model is given in Table 2.

The first input quantity of 0.00001 kg is to provide a better graphic plot of latter results. Other quantities of 0.010 and 0.100 and 0.005 and 0.050 kg were those derived from the SWRRB data. The quantities were not adjusted to reflect large areas. (At present the effect of large field runoff is being studied with respect to the quantity of material that could enter an aquatic system). If large field quantities are desired, multiply the outputs from the EXAMS model by that desired field size - the results are linear with respect to the pesticide inputs. It should be noted that the effective pesticide runoff quantity from a 100 acre field may only be equal to that released from a 5 to 10 acre field.

The maximum quantity of material that was predicted to occur in the Athens ERL model pond was 5 ppb dissolved in the water when .100 kg was introduced into the system. That quantity found sorbed onto suspended particles was about 10 ppb (mg/kg dry weight of suspended material). The pesticide has a calculated half-life of about 15 days for both dissolved and sorbed suspended material.

In the Athens ERL river model thiodicarb does not exceed 5 ppb at the point of input and dissipates rapidly to less than 1 ppb by the time it reaches the third water compartment some 2 km down stream.

IV Conclusions:

The expected environmental concentration in an aquatic system should be no more than 5 ppb when the runoff input is 0.100 Kg with no other inputs of this quantity for several weeks.

Robert W. Holst 24 JAN 1983

Robert W. Holst
Plant Physiologist
Environmental Fate Branch, HED (TS-769)

Right Panel

RECOMMENDED USES

CROP	INSECT	DOSAGE PER ACRE Pounds Active	DOSAGE PER ACRE Pounds 75 WP	SPECIFIC DIRECTIONS
Field Corn	Armyworms (Including Fall, True, Southern, Beet, Yellowstriped, etc.) European Corn Borer Western Bean Cutworm Corn earworm	0.5 to 1.0	0.66 to 1.33	Foliage, silk, and ear feeders: Refer to general use directions. Insects feeding in plant whorl: For best results use sprays of 10 gallons or more per acre applied by ground equipment using solid or hollow cone nozzles directed into the plant whorl.
	Cutworms (Including Black, etc.)			Postemergence rescue treatments only: For best results apply as a broadcase spray when cutworms are actively feeding. If banding use a minimum width of 10 inches over the row. To determine the amount of chemical to use per acre divide the band width by the row width and multiply by the appropriate broadcast rate.
Sweet Corn	Corn Earworm European Corn Borer Armyworms Western Bean Cutworm	0.5 to 0.75	0.66 to 1.00	Insects attacking silks and ears: Apply at 1-7 day intervals starting when silks first appear and continuing until silks begin to dry, or infestation potential ceases Follow local recommendations for proper timing. Whorl or foliage feeders: Refer to general directions for use and specific directions under field corn.

PRE-HARVEST AND GRAZING USE INFORMATION AND LIMITATIONS

To avoid illegal residues in or on:

FIELD & POPCORN

Do not exceed 4.0 pounds of active ingredient (5.32 pounds of 75WP) per acre per season.
Do not harvest grain before 28 days after the last application.
Do not feed treated green forage or ensilage before 7 days after the last application
Do not feed fodder or stover before 28 days after las application.

4

SWEET CORN

Do not exceed 7.4 pounds of active ingredient (10 pounds of 75WP) per acre per season.
Do not allow livestock to graze treated field.
Do not feed treated corn silage (green plant) or fodder to livestock.
Ears may be harvested on day of last application.
Processing waste may be fed or ensiled on day of last application.

FIELD USE CONVERSION TABLE

DOSAGE PER ACRE		
Pounds Active	Pounds 75 WP	Acres treated by 10 lbs LARVIN 75 WP
0.25	.33	30.3
0.33	.44	22.7
0.40	.53	18.9
0.45	.60	16.6
0.50	.66	15.2
0.55	.73	13.7
0.60	.80	12.5
0.65	.87	11.5
0.70	.93	10.7
0.75	1.00	10.0
0.90	1.20	8.3
1.0	1.33	7.5

Table 1: SWRRB Input for Thiodicarb

K_d (sorption coefficient)	= 1.00
Washoff fraction	= 10%
Half life on foliage	= 2 days
Degradation Rate in soil	= 1.7×10^{-1} /day
Application Efficiency	= 75%

Table 2:

EXAMS -- EXposure Analysis Modeling System -- V2.0: Mode 2

Chemical: THIODICARB

TABLE 1.1. SH2 (NEUTRAL MOLECULE, SPECIES #1) INPUT DATA.

MWT= 354.5	SOL = 35.00	VAPR= 4.3000E-05	HENRY= 0.0000
KPS= 1.200	KPB = 0.0000	KOC = 0.0000	KOW = 45.00
KAH1= 3.3600E-06	EAH1= 0.0000	KNH1= 2.0000E-04	ENH1= 0.0000
KBH1= 3.1600E-07	EBH1= 0.0000	KOX1= 0.0000	EOX1= 0.0000
KBACW2= 0.0000	QTW2= 0.0000	KBACS2= 7.0000E-10	QTS2= 0.0000
KDP= 3.5000E-04	RFLAT= 40.00	LAMAX= 0.00	

Table 3. Runoff quantities by Julian date for the three river basins. Quantities are expressed in lb ai/acre.

Yazoo MS		
1971		
180	1.00	
187	1.00	
194	1.00	
197		.020
201	1.00	
206		.002
209		.006
210		.001
1972		
180	1.00	
182		.004
185		.035
186		.036
187	1.00	
195	1.00	
202	1.00	
1973		
180	1.00	.008
181		.065
185		.024
187	1.00	.007
188		.069
195	1.00	
202	1.00	
210		.002

Tifton GA		
1971		
180	1.00	
183		.001
185		.001
187	1.00	
194	1.00	
201	1.00	
1972		
180	1.00	
187	1.00	
195	1.00	
198		.003
202	1.00	
206		.001
1973		
180	1.00	
187	1.00	
194	1.00	
199		.001
202	1.00	

Coshocton OH		
1968		
180	1.00	
187	1.00	
194	1.00	
201	1.00	
206		.001
1969		
180	1.00	
186		.056
187	1.00	
188		.094
195	1.00	
201		.003
202	1.00	
208		.009
1970		
180	1.00	
187	1.00	
189		.011
194	1.00	
202	1.00	

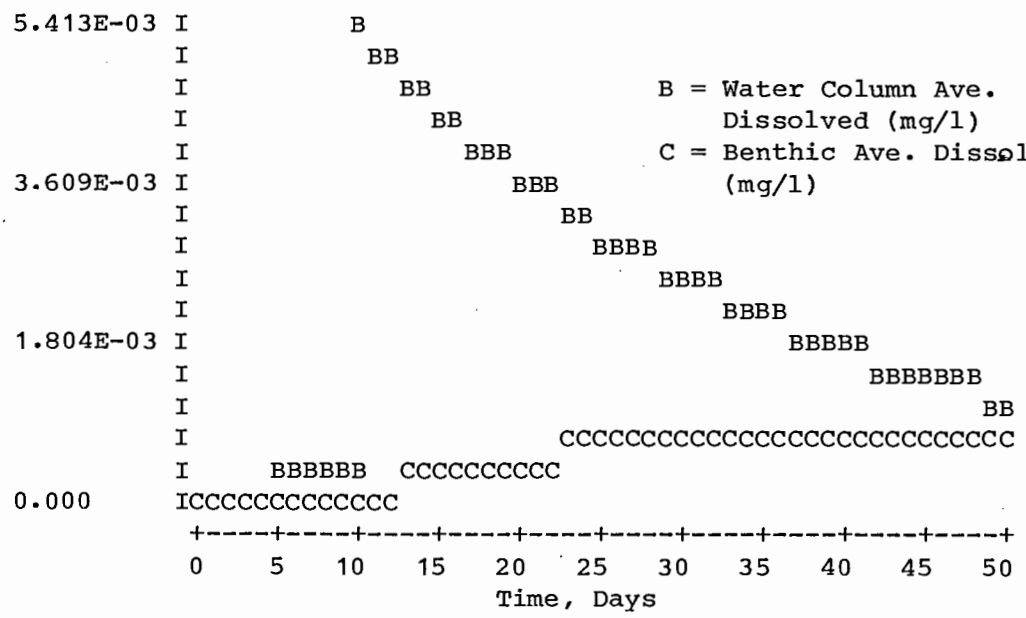
System: POND, AERL DEVELOPMENT PHASE TEST DEFINITION
Chemical: THIODICARB

Time	Water Column			Benthic		
(days)	Average Dissolved (mg/l)	Average Sorbed (mg/kg)	Total Mass (kg)	Average Dissolved (mg/l)	Average Sorbed (mg/kg)	Total Mass (kg)
Initial input 0.000001 kg						
0	5.000E-08	9.224E-08	1.000E-06	0.000E-01	0.000E-01	0.000E-01
1	4.812E-08	8.878E-08	9.624E-07	6.391E-10	1.179E-09	9.559E-10
2	4.631E-08	8.545E-08	9.263E-07	1.226E-09	2.261E-09	1.833E-09
3	4.458E-08	8.225E-08	8.916E-07	1.763E-09	3.253E-09	2.637E-09
4	4.291E-08	7.917E-08	8.582E-07	2.254E-09	4.159E-09	3.371E-09
5	4.130E-08	7.621E-08	8.261E-07	2.702E-09	4.985E-09	4.041E-09
Runoff input 0.010 kg						
5	5.000E-04	9.225E-04	1.000E-02	2.702E-09	4.985E-09	4.041E-09
6	4.812E-04	8.879E-04	9.625E-03	6.395E-06	1.180E-05	9.563E-06
7	4.632E-04	8.546E-04	9.264E-03	1.226E-05	2.262E-05	1.834E-05
8	4.458E-04	8.225E-04	8.917E-03	1.763E-05	3.253E-05	2.637E-05
9	4.291E-04	7.917E-04	8.583E-03	2.254E-05	4.159E-05	3.372E-05
10	4.131E-04	7.621E-04	8.262E-03	2.702E-05	4.986E-05	4.041E-05
Runoff input 0.100 kg						
10	5.413E-03	9.987E-03	1.083E-01	2.702E-05	4.986E-05	4.041E-05
11	5.210E-03	9.612E-03	1.042E-01	9.501E-05	1.753E-04	1.421E-04
12	5.014E-03	9.251E-03	1.003E-01	1.574E-04	2.903E-04	2.353E-04
13	4.826E-03	8.905E-03	9.653E-02	2.144E-04	3.956E-04	3.207E-04
14	4.646E-03	8.571E-03	9.292E-02	2.665E-04	4.917E-04	3.986E-04
15	4.472E-03	8.251E-03	8.944E-02	3.140E-04	5.793E-04	4.696E-04
16	4.305E-03	7.943E-03	8.610E-02	3.571E-04	6.589E-04	5.341E-04
17	4.144E-03	7.646E-03	8.289E-02	3.962E-04	7.310E-04	5.925E-04
18	3.990E-03	7.361E-03	7.980E-02	4.314E-04	7.960E-04	6.452E-04
19	3.841E-03	7.087E-03	7.682E-02	4.632E-04	8.545E-04	6.927E-04
20	3.698E-03	6.823E-03	7.396E-02	4.915E-04	9.069E-04	7.351E-04
21	3.560E-03	6.569E-03	7.121E-02	5.168E-04	9.536E-04	7.729E-04
22	3.428E-03	6.325E-03	6.857E-02	5.392E-04	9.949E-04	8.064E-04
23	3.301E-03	6.090E-03	6.602E-02	5.589E-04	1.031E-03	8.359E-04
24	3.178E-03	5.864E-03	6.357E-02	5.761E-04	1.063E-03	8.616E-04
25	3.061E-03	5.647E-03	6.122E-02	5.910E-04	1.090E-03	8.839E-04
26	2.947E-03	5.438E-03	5.895E-02	6.037E-04	1.114E-03	9.029E-04
27	2.838E-03	5.236E-03	5.677E-02	6.144E-04	1.134E-03	9.188E-04
28	2.733E-03	5.043E-03	5.467E-02	6.232E-04	1.150E-03	9.320E-04
29	2.632E-03	4.857E-03	5.265E-02	6.303E-04	1.163E-03	9.426E-04
30	2.535E-03	4.677E-03	5.071E-02	6.357E-04	1.173E-03	9.508E-04
31	2.442E-03	4.505E-03	4.884E-02	6.397E-04	1.180E-03	9.567E-04
32	2.352E-03	4.339E-03	4.704E-02	6.423E-04	1.185E-03	9.606E-04
33	2.265E-03	4.179E-03	4.530E-02	6.437E-04	1.188E-03	9.626E-04
34	2.182E-03	4.025E-03	4.364E-02	6.438E-04	1.188E-03	9.629E-04
35	2.102E-03	3.877E-03	4.203E-02	6.429E-04	1.186E-03	9.615E-04
40	1.743E-03	3.217E-03	3.487E-02	6.252E-04	1.154E-03	9.350E-04
45	1.447E-03	2.670E-03	2.895E-02	5.918E-04	1.092E-03	8.850E-04
50	1.202E-03	2.219E-03	2.405E-02	5.492E-04	1.013E-03	8.213E-04

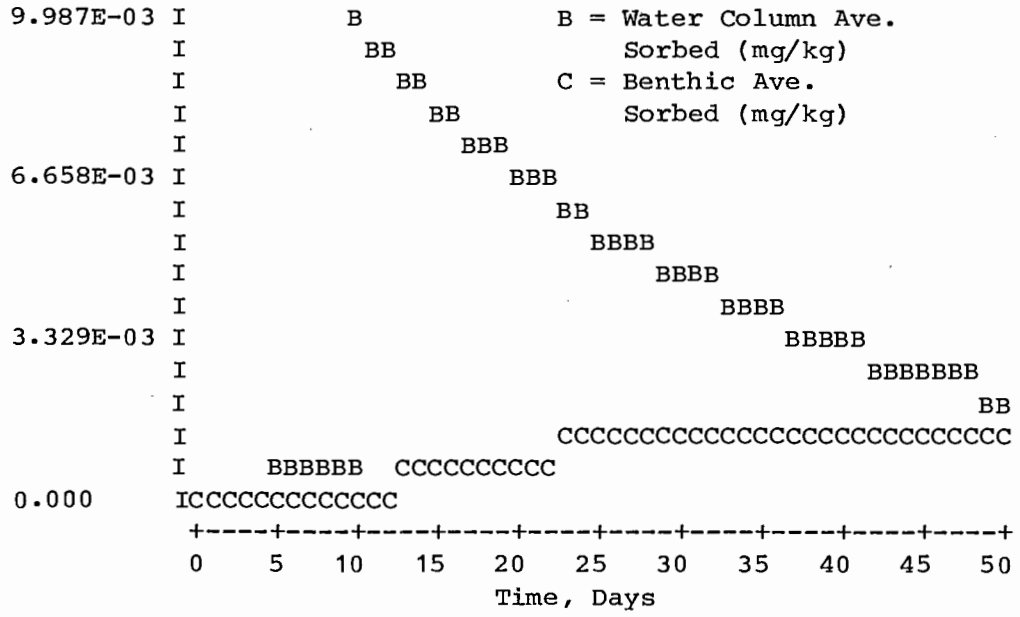
System: POND, AERL DEVELOPMENT PHASE TEST DEFINITION
Chemical: THIODICARB

Time	Water Column			Benthic		
	Average Dissolved	Average Sorbed	Total Mass	Average Dissolved	Average Sorbed	Total Mass
(days)	(mg/l)	(mg/kg)	(kg)	(mg/l)	(mg/kg)	(kg)
Initial input 0.000001 kg						
0	5.000E-08	9.224E-08	1.000E-06	0.000E-01	0.000E-01	0.000E-01
1	4.812E-08	8.878E-08	9.624E-07	6.391E-10	1.179E-09	9.559E-10
2	4.631E-08	8.545E-08	9.263E-07	1.226E-09	2.261E-09	1.833E-09
3	4.458E-08	8.225E-08	8.916E-07	1.763E-09	3.253E-09	2.637E-09
4	4.291E-08	7.917E-08	8.582E-07	2.254E-09	4.159E-09	3.371E-09
5	4.130E-08	7.621E-08	8.261E-07	2.702E-09	4.985E-09	4.041E-09
Runoff Input 0.005 kg						
5	2.500E-04	4.613E-04	5.001E-03	2.702E-09	4.985E-09	4.041E-09
6	2.406E-04	4.440E-04	4.813E-03	3.199E-06	5.902E-06	4.784E-06
7	2.316E-04	4.273E-04	4.632E-03	6.132E-06	1.131E-05	9.171E-06
8	2.229E-04	4.113E-04	4.459E-03	8.819E-06	1.627E-05	1.319E-05
9	2.146E-04	3.959E-04	4.292E-03	1.127E-05	2.080E-05	1.686E-05
10	2.066E-04	3.811E-04	4.131E-03	1.351E-05	2.493E-05	2.021E-05
Runoff Input 0.050 kg						
10	2.706E-03	4.993E-03	5.413E-02	1.351E-05	2.493E-05	2.021E-05
11	2.605E-03	4.806E-03	5.210E-02	4.751E-05	8.765E-05	7.105E-05
12	2.507E-03	4.626E-03	5.015E-02	7.868E-05	1.452E-04	1.177E-04
13	2.413E-03	4.452E-03	4.827E-02	1.072E-04	1.978E-04	1.603E-04
14	2.323E-03	4.286E-03	4.646E-02	1.333E-04	2.459E-04	1.993E-04
15	2.236E-03	4.125E-03	4.472E-02	1.570E-04	2.897E-04	2.348E-04
16	2.152E-03	3.971E-03	4.305E-02	1.786E-04	3.295E-04	2.671E-04
17	2.072E-03	3.823E-03	4.144E-02	1.981E-04	3.655E-04	2.963E-04
18	1.995E-03	3.680E-03	3.990E-02	2.157E-04	3.980E-04	3.226E-04
19	1.921E-03	3.543E-03	3.841E-02	2.316E-04	4.273E-04	3.463E-04
20	1.849E-03	3.411E-03	3.698E-02	2.458E-04	4.535E-04	3.676E-04
21	1.780E-03	3.285E-03	3.561E-02	2.584E-04	4.768E-04	3.865E-04
22	1.714E-03	3.162E-03	3.428E-02	2.696E-04	4.975E-04	4.032E-04
23	1.650E-03	3.045E-03	3.301E-02	2.795E-04	5.156E-04	4.180E-04
24	1.589E-03	2.932E-03	3.179E-02	2.881E-04	5.315E-04	4.308E-04
25	1.530E-03	2.823E-03	3.061E-02	2.955E-04	5.452E-04	4.419E-04
26	1.474E-03	2.719E-03	2.947E-02	3.019E-04	5.569E-04	4.514E-04
27	1.419E-03	2.618E-03	2.838E-02	3.072E-04	5.668E-04	4.594E-04
28	1.367E-03	2.521E-03	2.733E-02	3.116E-04	5.749E-04	4.660E-04
29	1.316E-03	2.428E-03	2.632E-02	3.151E-04	5.814E-04	4.713E-04
30	1.268E-03	2.339E-03	2.535E-02	3.179E-04	5.865E-04	4.754E-04
31	1.221E-03	2.252E-03	2.442E-02	3.199E-04	5.901E-04	4.784E-04
32	1.176E-03	2.169E-03	2.352E-02	3.212E-04	5.925E-04	4.803E-04
33	1.133E-03	2.090E-03	2.265E-02	3.218E-04	5.938E-04	4.813E-04
34	1.091E-03	2.013E-03	2.182E-02	3.219E-04	5.939E-04	4.814E-04
35	1.051E-03	1.939E-03	2.102E-02	3.215E-04	5.931E-04	4.808E-04
40	8.717E-04	1.608E-03	1.744E-02	3.126E-04	5.768E-04	4.675E-04
45	7.237E-04	1.335E-03	1.447E-02	2.959E-04	5.459E-04	4.425E-04
50	6.012E-04	1.109E-03	1.203E-02	2.746E-04	5.066E-04	4.106E-04

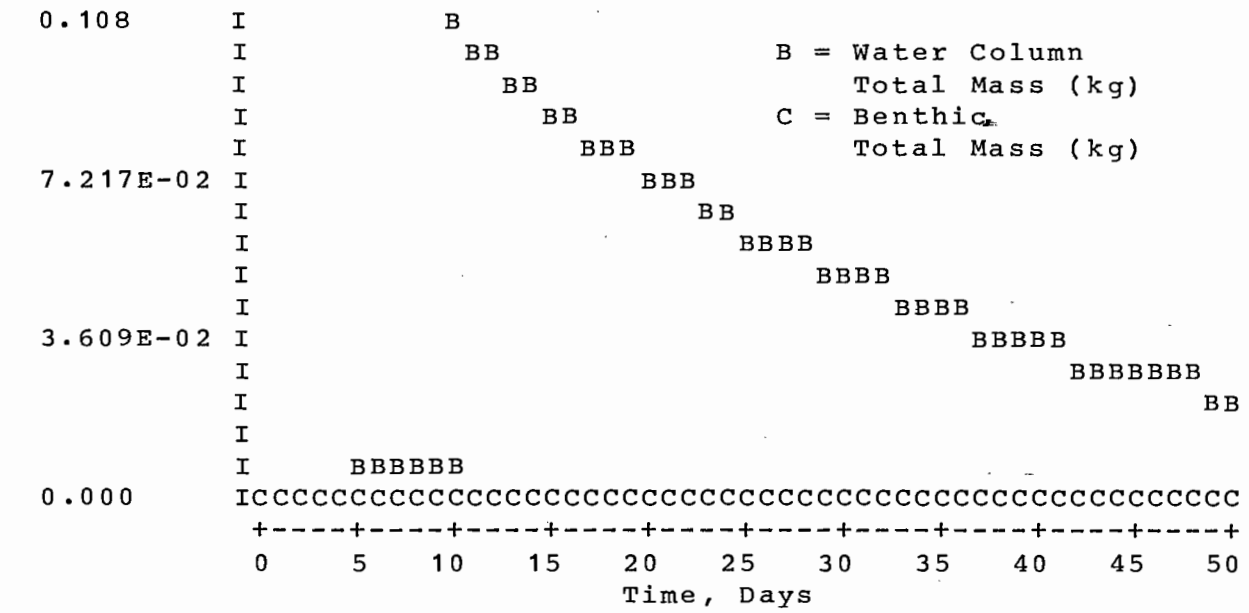
System: POND, AERL DEVELOPMENT PHASE TEST DEFINITION
Chemical: THIODICARB
Inputs: .000001 kg, day 0; .010 kg, day 5; .100 kg, day 10



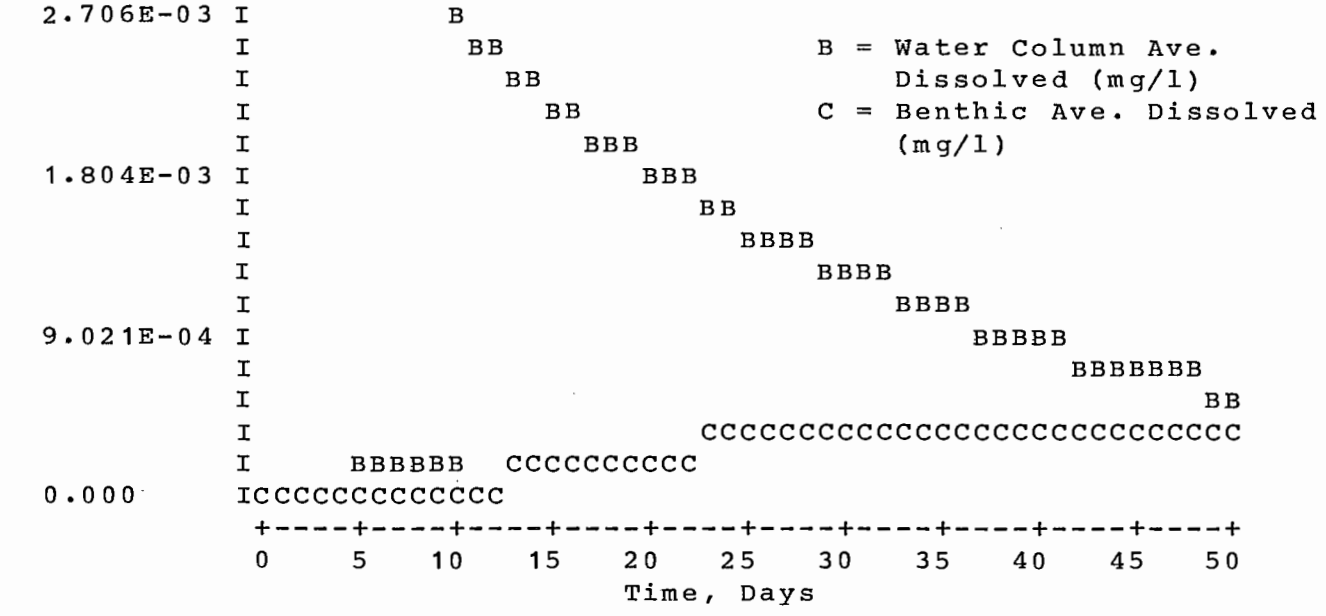
System: POND, AERL DEVELOPMENT PHASE TEST DEFINITION
Chemical: THIODICARB
Inputs: .000001 kg, day 0; .010 kg, day 5; .100 kg, day 10



System: POND, AERL DEVELOPMENT PHASE TEST DEFINITION
Chemical: THIODICARB
Inputs: .000001 kg, day 0; .010 kg, day 5; .100 kg, day 10



Compound: THIODICARB
Environment: POND, AERL DEVELOPMENT PHASE TEST DEFINITION
Inputs: .000001 kg, day 0; .005 kg, day 5; .050 kg, day 10



ENVIRONMENT: RIVER, AERL DEVELOPMENT PHASE TEST DEFINITION
CHEMICAL: THIODICARB

	Dissolved		Dissol.	Sorbed	Total Concentration		Mass	
	Water	Benthic	Water	Benthic	Water	Benthic	Water	Benthic
	Ave.(?)	Ave.(?)	Comp. 5	Comp. 6	Comp. 5	Comp. 6	Comp. 5	Comp. 6
day	(mg/l)	(mg/l)	(mg/l)	(mg/kg)	(mg/l)	(mg/kg)	(kg/m^2)	(kg/m^2)
Initial Input 0.000001 kg								
0	1.111E-09	0.000E-01	0.000E-01	0.000E-01	0.000E-01	0.000E-01	0.000E-01	0.000E-01
1	3.110E-07	-1.462E-10	9.481E-07	-8.086E-10	9.481E-07	-9.741E-10	2.844E-06	-6.577E-11
2	3.053E-07	-1.448E-10	9.230E-07	-7.944E-10	9.230E-07	-9.570E-10	2.769E-06	-6.461E-11
3	1.167E-07	-5.519E-11	3.520E-07	-3.034E-10	3.520E-07	-3.655E-10	1.056E-06	-2.468E-11
4	2.132E-08	-9.647E-12	6.419E-08	-5.492E-11	6.419E-08	-6.616E-11	1.926E-07	-4.467E-12
5	9.696E-07	4.652E-10	-2.917E-06	2.528E-09	-2.917E-06	3.045E-09	8.752E-06	2.056E-10
Runoff Input 0.005 kg								
5	4.586E-06	4.652E-10	-2.917E-06	2.528E-09	-2.917E-06	3.045E-09	8.752E-06	2.056E-10
6	7.802E-07	4.042E-09	2.377E-06	8.030E-09	2.377E-06	9.673E-09	7.132E-06	6.531E-10
7	1.054E-06	3.200E-09	3.186E-06	4.182E-09	3.186E-06	5.038E-09	9.558E-06	3.402E-10
8	8.483E-07	2.789E-09	2.557E-06	2.560E-09	2.558E-06	3.084E-09	7.673E-06	2.082E-10
9	5.251E-07	2.564E-09	1.581E-06	1.917E-09	1.581E-06	2.309E-09	4.743E-06	1.559E-10
10	1.854E-07	2.438E-09	5.576E-07	1.779E-09	5.576E-07	2.143E-09	1.673E-06	1.447E-10
Runoff input 0.050 kg								
10	5.574E-05	2.438E-09	5.576E-07	1.779E-09	5.576E-07	2.143E-09	1.673E-06	1.447E-10
11	5.559E-07	4.667E-08	-1.700E-06	1.036E-07	-1.700E-06	1.248E-07	5.101E-06	8.429E-09
12	2.147E-08	3.913E-08	6.499E-08	7.031E-08	6.500E-08	8.469E-08	1.950E-07	5.718E-09
13	-1.519E-06	3.464E-08	-4.584E-06	5.241E-08	-4.584E-06	6.313E-08	1.375E-05	4.263E-09
14	-8.992E-07	3.043E-08	-2.709E-06	3.571E-08	-2.709E-06	4.301E-08	8.126E-06	2.904E-09
15	-5.208E-07	2.725E-08	-1.567E-06	2.433E-08	-1.567E-06	2.931E-08	4.702E-06	1.979E-09
16	-1.648E-07	2.473E-08	-4.957E-07	1.625E-08	-4.958E-07	1.957E-08	1.487E-06	1.321E-09
17	-6.443E-09	2.275E-08	-1.937E-08	1.091E-08	-1.937E-08	1.314E-08	5.811E-08	8.872E-10
18	8.542E-08	2.114E-08	2.567E-07	7.277E-09	2.567E-07	8.766E-09	7.701E-07	5.919E-10
19	6.818E-10	1.985E-08	2.047E-09	5.162E-09	2.047E-09	6.219E-09	6.142E-09	4.199E-10
20	1.611E-07	1.862E-08	4.839E-07	3.136E-09	4.839E-07	3.778E-09	1.452E-06	2.551E-10
21	2.208E-08	1.767E-08	6.630E-08	2.391E-09	6.631E-08	2.880E-09	1.989E-07	1.945E-10
22	-7.943E-07	1.714E-08	-2.385E-06	3.757E-09	-2.385E-06	4.525E-09	7.156E-06	3.055E-10
23	-2.897E-07	1.605E-08	-8.698E-07	1.916E-09	-8.699E-07	2.308E-09	2.610E-06	1.559E-10
24	-3.801E-08	1.515E-08	-1.141E-07	8.986E-10	-1.141E-07	1.082E-09	3.423E-07	7.309E-11
25	5.422E-07	1.414E-08	1.628E-06	-8.629E-10	1.628E-06	-1.039E-09	4.884E-06	-7.018E-11
26	3.037E-10	1.372E-08	9.111E-10	3.783E-10	9.111E-10	4.557E-10	2.733E-09	3.077E-11
27	1.136E-09	1.308E-08	3.411E-09	2.581E-10	3.411E-09	3.109E-10	1.023E-08	2.099E-11
28	6.694E-07	1.215E-08	2.009E-06	-1.565E-09	2.009E-06	-1.885E-09	6.028E-06	-1.273E-10
29	1.732E-07	1.182E-08	5.199E-07	-3.277E-10	5.200E-07	-3.948E-10	1.560E-06	-2.665E-11
30	2.286E-08	1.134E-08	6.862E-08	2.572E-11	6.862E-08	3.098E-11	2.059E-07	2.092E-12
31	-7.866E-07	1.121E-08	-2.361E-06	2.109E-09	-2.361E-06	2.541E-09	7.083E-06	1.716E-10
32	-8.782E-12	1.034E-08	-2.688E-11	4.064E-11	-2.688E-11	4.896E-11	8.065E-11	3.306E-12
33	3.347E-13	9.872E-09	5.037E-13	2.866E-11	5.038E-13	3.452E-11	1.511E-12	2.331E-12
34	3.196E-13	9.430E-09	4.808E-13	2.068E-11	4.808E-13	2.492E-11	1.442E-12	1.682E-12
35	3.054E-13	9.015E-09	4.591E-13	1.541E-11	4.592E-13	1.857E-11	1.377E-12	1.254E-12
40	2.444E-13	7.222E-09	3.668E-13	3.899E-12	3.669E-13	4.697E-12	1.101E-12	3.171E-13
45	1.986E-13	5.872E-09	2.981E-13	1.437E-12	2.981E-13	1.731E-12	8.943E-13	1.169E-13
50	1.614E-13	4.772E-09	2.422E-13	5.406E-13	2.422E-13	6.512E-13	7.265E-13	4.397E-14