UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES, AND
TOXIC SUBSTANCES

PC Code: 079401
DP Barcode: D260506

MEMORANDUM

October 28, 1999

SUBJECT: **Endosulfan:** Refined Drinking Water EECs for Use in the Human Health Risk Assessment.

TO: Phillip Budig, PM Team Reviewer
Robert McNally, Product Manager 60
Registration Division (7505C)

FROM: Dirk F. Young, Ph.D., Environmental Engineer
Environmental Fate and Effects Division (7507C)

THRU: Mah T. Shamim, Ph.D., Chief
ERB IV/EFED (7507C)

10/28/99

This memo summarizes the Tier II estimated environmental concentrations (EECs) for endosulfan in surface water and groundwater for use in the human health risk assessments. The EECs are summarized in Table 1.

Table 1. Tier II Drinking water EECs for Drinking Water

Isomer	Surface Water Peak EEC	Surface Water Chronic EEC	Ground Water EEC
α-endosulfan	5.2 µg/L	0.88 µg/L	0.013 µg/L
β-endosulfan	2.4 µg/L	0.39 µg/L	0.006 µg/L
Total	7.6 µg/L	1.27 µg/L	0.019 µg/L

In Table 1, the peak surface water EEC represents the upper 1-in-10-year peak event concentration, and the surface water chronic EEC represents the upper 1-in-10-year mean annual concentration. EFED based these surface water EECs on PRZM/EXAMS simulations with the maximum allowable application of endosulfan (1.0 lb a.i. / acre, 3 times per year) to a cotton crop in Mississippi, which likely represents a worst-case scenario. EFED conducted separate simulations for the α- and β-endosulfan isomers, with the application solution comprising 70% α-endosulfan and 30% β-endosulfan. EFED's standard cotton scenario represents a 10-ha cotton field adjacent to a 1-ha pond that is 2 meters deep and has neither hydraulic inlets nor outlets (i.e., pesticide cannot leave by outflow). The simulation was generated with 19 years of

weather data, encompassing the years from 1964 to 1983. Endosulfan enters the pond by both spraydrift and runoff. A summary of the parameters used for the PRZM/EXAMS simulations is given in Table 2. All parameters were taken according to standard EFED practice. The input files for α- and β-endosulfan are located in Attachments 1 and 2, and the output files are located in Attachments 3 and 4, respectively.

The groundwater EECs in Table 1 were generated with SCIGROW. Input parameters and output for the SCIGROW runs can be found in Attachment 5. All parameters used as inputs were chosen according to standard EFED practice. As with the surface water concentrations, the ratio of α-endosulfan to β-endosulfan in the applied solution was 70:30.

Table 2. PRZM/EXAMS environmental fate input parameters

chemical	α- endosulfan	β - endosulfan
molecular weight	406.9	406.9
Solubility	530 µg/L	280 µg/L
vapor pressure	3.0×10^{-6} torr	7.2×10^{-7} torr
pH 7 hydrolysis half life	19 days	10.7 days
aqueous photolysis half life (near surface)	stable	stable
soil photolysis half life	stable	stable
aerobic soil metabolism half life	57 days (upper 90% c.i.)	208 days (upper 90% c.i.)
aerobic aquatic metabolism half life	114 days (2 x 57 day soil metabolism PRZM value)	416 days (2 x 125 day soil metabolism PRZM value)
anaerobic aquatic metabolism half life	286 days (2 x upper 90% c.i. of anaerobic soil study)	382 days (2 x upper 90% c.i. of anaerobic soil study)
soil organic carbon partitioning (Koc)	9780 L kg^{-1} (mean value)	13582 L kg^{-1} (mean value)
crop	cotton	cotton
application rate	70% of 1 lb a.i. acre	30% of 1 lb a.i. acre
number of applications	3	3
application method	aerial	aerial
application dates	1-Jun, 9-Jul, 16-Aug [a]	1-Jun, 9-Jul, 16-Aug [a]
spray efficiency	75%	75%
spray drift	5% of mass applied to 1 acre at each application time	5% of mass applied to 1 acre at each application time

[a] Application dates were taken from the registrant's PRZM simulations, which were included in a July 7, 1999 letter from AgrEvo. Label does not specify intervals.

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ATTACHMENT 1: α-endosulfan PRZM Input File

```
*** PRZM 3.1;File modified 10/25/99 from mscottn1.inp ***
*** Location: Yazoo County, Mississippi; MLRA: O-134 ***
*** Weather: MET131.MET Jackson, MS ***
*** Manning's N: Assume fallow surface with residues not more than 1 ton/acre
*** See MSCOTTN1.wpd for scenario description and metadata ***
Chemical: endosulfan (alpha)
Location: Mississippi; Crop: cotton;  MLRA: O-134
*** record 3
    0.76    0.15       0   17.00       1       1
***record 6
       4
***record 7
    0.49    0.40    0.75   10.00    5.80       4    6.00   354.0
***record 8
       3
***record 9
       1    0.20  125.00   98.00       3  99  93  92                0.00
120.00
       2    0.20  125.00   98.00       3  94  84  83                0.00
120.00
       3    0.20  125.00   98.00       3  99  83  83                0.00
120.00
       1       3
0101 2109 2209
0.63 0.16 0.18
0.02 0.02 0.02
       2       3
0105 0709 2209
0.16 0.13 0.13
0.02 0.02 0.02
       3       3
0105 0709 2209
0.16 0.13 0.09
0.02 0.02 0.02
***record 10
      20
***record 11
  01 564  07 964  220964       1
  01 565  07 965  220965       2
  01 566  07 966  220966       3
  01 567  07 967  220967       1
  01 568  07 968  220968       2
  01 569  07 969  220969       3
  01 570  07 970  220970       1
  01 571  07 971  220971       2
  01 572  07 972  220972       3
  01 573  07 973  220973       1
  01 574  07 974  220974       2
  01 575  07 975  220975       3
```

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  01 576   07 976   220976        1
  01 577   07 977   220977        2
  01 578   07 978   220978        3
  01 579   07 979   220979        1
  01 580   07 980   220980        2
  01 581   07 981   220981        3
  01 582   07 982   220982        1
  01 583   07 983   220983        2
Application schedule: XX (appl. method) apps @ XX.XXkg/ha @ XX% eff w/ X%
drift
      60        1        0        0
Chemical: Koc=9780 (alpha) ; AESM t1/2 = XX days
  010664   0 2 0.00   1.12 0.75 0.05
  090764   0 2 0.00   1.12 0.75 0.05
  160864   0 2 0.00   1.12 0.75 0.05
  010665   0 2 0.00   1.12 0.75 0.05
  090765   0 2 0.00   1.12 0.75 0.05
  160865   0 2 0.00   1.12 0.75 0.05
  010666   0 2 0.00   1.12 0.75 0.05
  090766   0 2 0.00   1.12 0.75 0.05
  160866   0 2 0.00   1.12 0.75 0.05
  010667   0 2 0.00   1.12 0.75 0.05
  090767   0 2 0.00   1.12 0.75 0.05
  160867   0 2 0.00   1.12 0.75 0.05
  010668   0 2 0.00   1.12 0.75 0.05
  090768   0 2 0.00   1.12 0.75 0.05
  160868   0 2 0.00   1.12 0.75 0.05
  010669   0 2 0.00   1.12 0.75 0.05
  090769   0 2 0.00   1.12 0.75 0.05
  160869   0 2 0.00   1.12 0.75 0.05
  010670   0 2 0.00   1.12 0.75 0.05
  090770   0 2 0.00   1.12 0.75 0.05
  160870   0 2 0.00   1.12 0.75 0.05
  010671   0 2 0.00   1.12 0.75 0.05
  090771   0 2 0.00   1.12 0.75 0.05
  160871   0 2 0.00   1.12 0.75 0.05
  010672   0 2 0.00   1.12 0.75 0.05
  090772   0 2 0.00   1.12 0.75 0.05
  160872   0 2 0.00   1.12 0.75 0.05
  010673   0 2 0.00   1.12 0.75 0.05
  090773   0 2 0.00   1.12 0.75 0.05
  160873   0 2 0.00   1.12 0.75 0.05
  010674   0 2 0.00   1.12 0.75 0.05
  090774   0 2 0.00   1.12 0.75 0.05
  160874   0 2 0.00   1.12 0.75 0.05
  010675   0 2 0.00   1.12 0.75 0.05
  090775   0 2 0.00   1.12 0.75 0.05
  160875   0 2 0.00   1.12 0.75 0.05
  010676   0 2 0.00   1.12 0.75 0.05
  090776   0 2 0.00   1.12 0.75 0.05
  160876   0 2 0.00   1.12 0.75 0.05
```

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 010677  0 2 0.00  1.12 0.75 0.05
 090777  0 2 0.00  1.12 0.75 0.05
 160877  0 2 0.00  1.12 0.75 0.05
 010678  0 2 0.00  1.12 0.75 0.05
 090778  0 2 0.00  1.12 0.75 0.05
 160878  0 2 0.00  1.12 0.75 0.05
 010679  0 2 0.00  1.12 0.75 0.05
 090779  0 2 0.00  1.12 0.75 0.05
 160879  0 2 0.00  1.12 0.75 0.05
 010680  0 2 0.00  1.12 0.75 0.05
 090780  0 2 0.00  1.12 0.75 0.05
 160880  0 2 0.00  1.12 0.75 0.05
 010681  0 2 0.00  1.12 0.75 0.05
 090781  0 2 0.00  1.12 0.75 0.05
 160881  0 2 0.00  1.12 0.75 0.05
 010682  0 2 0.00  1.12 0.75 0.05
 090782  0 2 0.00  1.12 0.75 0.05
 160882  0 2 0.00  1.12 0.75 0.05
 010683  0 2 0.00  1.12 0.75 0.05
 090783  0 2 0.00  1.12 0.75 0.05
 160883  0 2 0.00  1.12 0.75 0.05
***record 17
   0.00       3    0.00
***record 18
   0.00    0.00    0.50
Soil Series: Loring silt loam; Hydrogic Group C
***record 20
 155.00    0.00   0   0   0   0   0   0   0   0   0
***record 26
   0.00    0.00   00.00
***record 33
      6
*** record 34
      1   13.00   1.400   0.385   0.000   0.000   0.000
*** record 36
           .0122   .0122    0.00
           0.100   0.385   0.151   2.180   213.3
      2   23.00   1.400   0.370   0.000   0.000   0.000
           .0122   .0122    0.00
           1.000   0.370   0.146   0.490    47.9
      3   33.00   1.400   0.370   0.000   0.000   0.000
           .0122   .0122    0.00
           1.000   0.370   0.146   0.160   15.7
      4   30.00   1.450   0.340   0.000   0.000   0.000
           .0122   .0122    0.00
           1.000   0.340   0.125   0.124   12.1
      5   23.00   1.490   0.335   0.000   0.000   0.000
         .000097 .000097    0.00
           1.000   0.335   0.137   0.070    0.7
      6   33.00   1.510   0.343   0.000   0.000   0.000
         .000097 .000097    0.00
```

```
        1.000    0.343    0.147    0.060     0.6
    0
  WATR    YEAR       10     PEST    YEAR       10     CONC     YEAR       10    1
    1
    1  -----
    7    DAY
  PRCP    TSER    0    0
  RUNF    TSER    0    0
  INFL    TSER    1    1
  ESLS    TSER    0    0    1.E3
  RFLX    TSER    0    0    1.E5
  EFLX    TSER    0    0    1.E5
  RZFX    TSER    0    0    1.E5
```

ATTACHMENT 2: β-endosulfan PRZM Input File

```
*** PRZM 3.1;File modified 10/25/99 from mscottn1.inp ***
*** Modified 10/25/99 ***
*** Location: Yazoo County, Mississippi; MLRA: O-134 ***
*** Weather: MET131.MET Jackson, MS ***
*** Manning's N: Assume fallow surface with residues not more than 1 ton/acre
*** See MSCOTTN1.wpd for scenario description and metadata ***
Chemical: endosulfan (beta)
Location: Mississippi; Crop: cotton;  MLRA: O-134
*** record 3
    0.76    0.15       0   17.00       1       1
***record 6
       4
***record 7
    0.49    0.40    0.75   10.00    5.80       4    6.00   354.0
***record 8
       3
***record 9
       1    0.20  125.00   98.00       3  99  93  92                0.00
120.00
       2    0.20  125.00   98.00       3  94  84  83                0.00
120.00
       3    0.20  125.00   98.00       3  99  83  83                0.00
120.00
       1       3
0101 2109 2209
0.63 0.16 0.18
0.02 0.02 0.02
       2       3
0105 0709 2209
0.16 0.13 0.13
0.02 0.02 0.02
       3       3
0105 0709 2209
0.16 0.13 0.09
0.02 0.02 0.02
```

```
***record 10
      20
***record 11
  01 564   07 964   220964        1
  01 565   07 965   220965        2
  01 566   07 966   220966        3
  01 567   07 967   220967        1
  01 568   07 968   220968        2
  01 569   07 969   220969        3
  01 570   07 970   220970        1
  01 571   07 971   220971        2
  01 572   07 972   220972        3
  01 573   07 973   220973        1
  01 574   07 974   220974        2
  01 575   07 975   220975        3
  01 576   07 976   220976        1
  01 577   07 977   220977        2
  01 578   07 978   220978        3
  01 579   07 979   220979        1
  01 580   07 980   220980        2
  01 581   07 981   220981        3
  01 582   07 982   220982        1
  01 583   07 983   220983        2
Application schedule: XX (appl. method) apps @ XX.XXkg/ha @ XX% eff w/ X%
drift
      60        1        0        0
Chemical: Koc=13582 (beta) ; AESM t1/2 = XX days
  010664   0 2 0.00   1.12 0.75 0.05
  090764   0 2 0.00   1.12 0.75 0.05
  160864   0 2 0.00   1.12 0.75 0.05
  010665   0 2 0.00   1.12 0.75 0.05
  090765   0 2 0.00   1.12 0.75 0.05
  160865   0 2 0.00   1.12 0.75 0.05
  010666   0 2 0.00   1.12 0.75 0.05
  090766   0 2 0.00   1.12 0.75 0.05
  160866   0 2 0.00   1.12 0.75 0.05
  010667   0 2 0.00   1.12 0.75 0.05
  090767   0 2 0.00   1.12 0.75 0.05
  160867   0 2 0.00   1.12 0.75 0.05
  010668   0 2 0.00   1.12 0.75 0.05
  090768   0 2 0.00   1.12 0.75 0.05
  160868   0 2 0.00   1.12 0.75 0.05
  010669   0 2 0.00   1.12 0.75 0.05
  090769   0 2 0.00   1.12 0.75 0.05
  160869   0 2 0.00   1.12 0.75 0.05
  010670   0 2 0.00   1.12 0.75 0.05
  090770   0 2 0.00   1.12 0.75 0.05
  160870   0 2 0.00   1.12 0.75 0.05
  010671   0 2 0.00   1.12 0.75 0.05
  090771   0 2 0.00   1.12 0.75 0.05
  160871   0 2 0.00   1.12 0.75 0.05
```

```
 010672  0 2 0.00  1.12 0.75 0.05
 090772  0 2 0.00  1.12 0.75 0.05
 160872  0 2 0.00  1.12 0.75 0.05
 010673  0 2 0.00  1.12 0.75 0.05
 090773  0 2 0.00  1.12 0.75 0.05
 160873  0 2 0.00  1.12 0.75 0.05
 010674  0 2 0.00  1.12 0.75 0.05
 090774  0 2 0.00  1.12 0.75 0.05
 160874  0 2 0.00  1.12 0.75 0.05
 010675  0 2 0.00  1.12 0.75 0.05
 090775  0 2 0.00  1.12 0.75 0.05
 160875  0 2 0.00  1.12 0.75 0.05
 010676  0 2 0.00  1.12 0.75 0.05
 090776  0 2 0.00  1.12 0.75 0.05
 160876  0 2 0.00  1.12 0.75 0.05
 010677  0 2 0.00  1.12 0.75 0.05
 090777  0 2 0.00  1.12 0.75 0.05
 160877  0 2 0.00  1.12 0.75 0.05
 010678  0 2 0.00  1.12 0.75 0.05
 090778  0 2 0.00  1.12 0.75 0.05
 160878  0 2 0.00  1.12 0.75 0.05
 010679  0 2 0.00  1.12 0.75 0.05
 090779  0 2 0.00  1.12 0.75 0.05
 160879  0 2 0.00  1.12 0.75 0.05
 010680  0 2 0.00  1.12 0.75 0.05
 090780  0 2 0.00  1.12 0.75 0.05
 160880  0 2 0.00  1.12 0.75 0.05
 010681  0 2 0.00  1.12 0.75 0.05
 090781  0 2 0.00  1.12 0.75 0.05
 160881  0 2 0.00  1.12 0.75 0.05
 010682  0 2 0.00  1.12 0.75 0.05
 090782  0 2 0.00  1.12 0.75 0.05
 160882  0 2 0.00  1.12 0.75 0.05
 010683  0 2 0.00  1.12 0.75 0.05
 090783  0 2 0.00  1.12 0.75 0.05
 160883  0 2 0.00  1.12 0.75 0.05
***record 17
   0.00       3    0.00
***record 18
   0.00    0.00    0.50
Soil Series: Loring silt loam; Hydrogic Group C
***record 20
  155.00    0.00   0   0   0   0   0   0   0   0   0
***record 26
   0.00    0.00   00.00
***record 33
      6
*** record 34
       1   13.00   1.400   0.385   0.000   0.000   0.000
*** record 36
           .0033   .0033    0.00
```

```
        0.100    0.385    0.151    2.180    296.1
   2    23.00    1.400    0.370    0.000    0.000    0.000
        .0033    .0033     0.00
        1.000    0.370    0.146    0.490     66.6
   3    33.00    1.400    0.370    0.000    0.000    0.000
        .0033    .0033     0.00
        1.000    0.370    0.146    0.160     21.7
   4    30.00    1.450    0.340    0.000    0.000    0.000
        .0033    .0033     0.00
        1.000    0.340    0.125    0.124    17.0
   5    23.00    1.490    0.335    0.000    0.000    0.000
        .0033    .0033     0.00
        1.000    0.335    0.137    0.070     .95
   6    33.00    1.510    0.343    0.000    0.000    0.000
        .0033    .0033     0.00
        1.000    0.343    0.147    0.060     0.8
   0
WATR    YEAR      10    PEST    YEAR      10    CONC    YEAR      10    1
   1
   1  -----
   7    DAY
PRCP    TSER    0    0
RUNF    TSER    0    0
INFL    TSER    1    1
ESLS    TSER    0    0    1.E3
RFLX    TSER    0    0    1.E5
EFLX    TSER    0    0    1.E5
RZFX    TSER    0    0    1.E5
```

ATTACHMENT 3: α-endosulfan

These results are normalized to an application rate of 1 lb/acre. To obtain the actual concentration for α-endosulfan, these values must be multiplied by the fraction of α-endosulfan in the application solution (i.e., 70 % for α-endosulfan).

WATER COLUMN DISSOLVED CONCENTRATION (PPB)

YEAR	PEAK	96 HOUR	21 DAY	60 DAY	90 DAY	YEARLY
1964	7.975	5.806	3.171	2.521	2.359	1.151
1965	7.025	5.108	2.689	1.854	1.644	1.264
1966	3.871	2.854	1.760	1.300	1.175	.876
1967	4.022	2.836	1.898	1.388	1.273	.844
1968	3.171	2.486	1.412	1.061	.986	.710
1969	4.204	3.049	1.600	1.068	.929	.594
1970	3.405	2.705	1.703	1.537	1.458	.842
1971	3.824	2.852	1.554	1.285	1.272	.911
1972	3.177	2.303	1.191	.977	.929	.665
1973	3.436	2.551	1.327	.979	.913	.616
1974	3.400	2.747	1.580	1.137	1.055	.766
1975	4.879	3.527	2.078	1.741	1.587	.938

1976	3.695	2.860	2.048	1.626	1.483	1.013
1977	3.511	2.559	1.402	1.249	1.163	.892
1978	3.162	2.294	1.194	.990	.923	.649
1979	7.494	5.546	3.338	2.608	2.435	1.309
1980	3.425	2.556	1.427	1.261	1.230	1.010
1981	3.677	2.594	1.465	1.142	1.080	.709
1982	4.457	3.208	2.299	1.941	1.670	1.075
1983	3.581	2.660	1.564	1.259	1.196	.959

SORTED FOR PLOTTING

PROB	PEAK	96 HOUR	21 DAY	60 DAY	90 DAY	YEARLY
.048	7.975	5.806	3.338	2.608	2.435	1.309
.095	7.494	5.546	3.171	2.521	2.359	1.264
.143	7.025	5.108	2.689	1.941	1.670	1.151
.190	4.879	3.527	2.299	1.854	1.644	1.075
.238	4.457	3.208	2.078	1.741	1.587	1.013
.286	4.204	3.049	2.048	1.626	1.483	1.010
.333	4.022	2.860	1.898	1.537	1.458	.959
.381	3.871	2.854	1.760	1.388	1.273	.938
.429	3.824	2.852	1.703	1.300	1.272	.911
.476	3.695	2.836	1.600	1.285	1.230	.892
.524	3.677	2.747	1.580	1.261	1.196	.876
.571	3.581	2.705	1.564	1.259	1.175	.844
.619	3.511	2.660	1.554	1.249	1.163	.842
.667	3.436	2.594	1.465	1.142	1.080	.766
.714	3.425	2.559	1.427	1.137	1.055	.710
.762	3.405	2.556	1.412	1.068	.986	.709
.810	3.400	2.551	1.402	1.061	.929	.665
.857	3.177	2.486	1.327	.990	.929	.649
.905	3.171	2.303	1.194	.979	.923	.616
.952	3.162	2.294	1.191	.977	.913	.594
1/10	7.447	5.502	3.123	2.463	2.290	1.253

MEAN OF ANNUAL VALUES = .890
STANDARD DEVIATION OF ANNUAL VALUES = .207
UPPER 90% CONFIDENCE LIMIT ON MEAN = .959

ATTACHMENT 4: β-endosulfan

These results are normalized to an application rate of 1 lb/acre. To obtain the actual concentration for β-endosulfan, these values must be multiplied by the fraction of β-endosulfan in the application solution (i.e., 30 % for β-endosulfan).

WATER COLUMN DISSOLVED CONCENTRATION (PPB)

YEAR	PEAK	96 HOUR	21 DAY	60 DAY	90 DAY	YEARLY
1964	7.985	5.232	2.693	2.245	2.040	1.042
1965	9.696	6.441	2.887	1.851	1.645	1.273
1966	3.846	2.611	1.719	1.248	1.139	.927
1967	4.318	2.753	1.769	1.311	1.234	.907

1968	3.295	2.408	1.364	1.080	1.046	.882
1969	4.677	3.042	1.466	.980	.864	.625
1970	4.509	2.997	1.967	1.690	1.587	.919
1971	5.602	3.708	1.791	1.410	1.370	1.148
1972	3.171	2.105	1.073	.920	.901	.759
1973	3.524	2.389	1.233	.962	.890	.735
1974	3.571	2.745	1.613	1.326	1.199	1.088
1975	6.312	4.060	2.175	1.732	1.654	1.058
1976	4.132	3.145	2.109	1.641	1.482	1.109
1977	3.757	2.533	1.427	1.274	1.214	1.106
1978	3.154	2.096	1.111	.932	.897	.749
1979	8.049	5.503	3.221	2.544	2.425	1.531
1980	3.696	2.633	1.907	1.629	1.608	1.293
1981	3.953	2.532	1.536	1.151	1.079	.794
1982	5.256	3.984	2.445	1.878	1.750	1.216
1983	3.733	2.620	1.741	1.586	1.537	1.312

SORTED FOR PLOTTING

PROB	PEAK	96 HOUR	21 DAY	60 DAY	90 DAY	YEARLY
.048	9.696	6.441	3.221	2.544	2.425	1.531
.095	8.049	5.503	2.887	2.245	2.040	1.312
.143	7.985	5.232	2.693	1.878	1.750	1.293
.190	6.312	4.060	2.445	1.851	1.654	1.273
.238	5.602	3.984	2.175	1.732	1.645	1.216
.286	5.256	3.708	2.109	1.690	1.608	1.148
.333	4.677	3.145	1.967	1.641	1.587	1.109
.381	4.509	3.042	1.907	1.629	1.537	1.106
.429	4.318	2.997	1.791	1.586	1.482	1.088
.476	4.132	2.753	1.769	1.410	1.370	1.058
.524	3.953	2.745	1.741	1.326	1.234	1.042
.571	3.846	2.633	1.719	1.311	1.214	.927
.619	3.757	2.620	1.613	1.274	1.199	.919
.667	3.733	2.611	1.536	1.248	1.139	.907
.714	3.696	2.533	1.466	1.151	1.079	.882
.762	3.571	2.532	1.427	1.080	1.046	.794
.810	3.524	2.408	1.364	.980	.901	.759
.857	3.295	2.389	1.233	.962	.897	.749
.905	3.171	2.105	1.111	.932	.890	.735
.952	3.154	2.096	1.073	.920	.864	.625
1/10	8.043	5.476	2.868	2.208	2.011	1.310

MEAN OF ANNUAL VALUES = 1.024
STANDARD DEVIATION OF ANNUAL VALUES = .234
UPPER 90% CONFIDENCE LIMIT ON MEAN = 1.102

ATTACHMENT 5: SCIGROW INPUT AND RESULTS

RUN No. 1 FOR **alpha-endosulfan** INPUT VALUES

APPL (#/AC) RATE	APPL. NO.	URATE (#/AC/YR)	SOIL KOC	SOIL AEROBIC METABOLISM (DAYS)

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APPL (#/AC) RATE	APPL. NO.	URATE (#/AC/YR)	SOIL KOC	SOIL AEROBIC METABOLISM (DAYS)	
.700	3	2.100	8971.0 (median)	49.0 (mean)	

GROUND-WATER SCREENING CONCENTRATIONS IN PPB

.013436

A=	44.000	B=	8976.000	C=	1.643	D=	3.953
F=	-2.194	G=	.006	URATE=	2.100	GWSC=	.013436

RILP= .077

RUN No. 2 FOR **beta-endosulfan** INPUT VALUES

APPL (#/AC) RATE	APPL. NO.	URATE (#/AC/YR)	SOIL KOC	SOIL AEROBIC METABOLISM (DAYS)	
.300	3	.900	12039.0 (median)	99.0 (mean)	

GROUND-WATER SCREENING CONCENTRATIONS IN PPB

.006000

A=	.000	B=	.000	C=	.000	D=	.000
F=	.000	G=	.000	URATE=	.900	GWSC=	.006000

RILP= .000