To: Walter Waldrop  
Product Manager 71  
Special Review and Reregistration Division (7508W)

From: Anthony F. Maciorowski, Chief  
Ecological Effects Branch/EFED (7507C)

Attached, please find the EEB review of...

Reg./File # : 081901  
Chemical Name : Chlorothalonil  
Type Product : Fungicide  
Product Name :  
Company Name : ISK Biotech Corporation  
Purpose : Submission of individual growth data for mysid shrimp life-cycle study.

<table>
<thead>
<tr>
<th>Action Code</th>
<th>Date Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>627</td>
<td>12/27/93</td>
</tr>
</tbody>
</table>

Reviewer : Tracy L. Perry

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EEB Guideline/MRID Summary Table: The review in this package contains an evaluation of the following:

<table>
<thead>
<tr>
<th>GDLN NO</th>
<th>MRID NO</th>
<th>CAT</th>
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<th>MRID NO</th>
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<th>MRID NO</th>
<th>CAT</th>
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<td>71-1(A)</td>
<td>72-2(A)</td>
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<td>122-1(A)</td>
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<td>72-3(B)</td>
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<td>72-3(C)</td>
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<td>72-3(E)</td>
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<td>71-2(B)</td>
<td>72-4(A)</td>
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<td>71-3</td>
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<td>71-4(A)</td>
<td>141-5</td>
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<td>72-1(C)</td>
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<td></td>
<td>72-1(D)</td>
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<td></td>
</tr>
</tbody>
</table>

Y=Acceptable (Study satisfied Guideline)/Concur  
P=Partial (Study partially fulfilled Guideline but additional information is needed)  
S=Supplemental (Study provided useful information but Guideline was not satisfied)  
N=Unacceptable (Study was rejected)/Nonconcur
MEMORANDUM

SUBJECT: Chlorothalonil: submission of individual growth data for mysid shrimp life-cycle study (MRID No. 424338-07).

FROM: Anthony Maciorowski, Branch Chief
Ecological Effects Branch
Environmental Fate and Effects Division (7507C)

TO: Walter Waldrop, PM 71
Reregistration Branch
Special Review and Reregistration Division (7508W)

In EEB's review of July 22, 1993, the mysid shrimp life-cycle study (MRID No. 424338-07) conducted with chlorothalonil was upgraded from invalid to supplemental. The study had the potential to be upgraded to core upon submission of individual growth data for both male and female mysid shrimp. ISK Biotech Corporation has provided these data with the current submission.

Individual growth data were analyzed using one-way analysis of variance (ANOVA) and William's test (Toxstat Version 3.3). Results show that female body weight at test termination was not significantly affected by exposure to chlorothalonil technical at the concentrations tested. Male body weight, however, was significantly increased at the top two test concentrations (see attached). Therefore, the NOEL/LOEL for male mysid shrimp weight were found to be 1.2 ug/L and 3.0 ug/L, respectively. The reproductive NOEL/LOEL, however, were 0.83 ug/L and 1.2 ug/L, respectively (see DER).

This study may now be upgraded to core and will fulfill guideline requirements for the mysid shrimp life-cycle study 72-4(b) with technical chlorothalonil (T-117-12). If you have any questions, please contact Tracy Perry at 305-6451 or Henry Craven at 305-5320.
The material not included contains the following type of information:

______ Identity of product inert ingredients.
______ Identity of product impurities.
______ Description of the product manufacturing process.
______ Description of quality control procedures.
______ Identity of the source of product ingredients.
______ Sales or other commercial/financial information.
______ A draft product label.
______ The product confidential statement of formula.
______ Information about a pending registration action.
______ FIFRA registration data.
______ The document is a duplicate of page(s) ________.
______ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.
Chlorothalonil: mysid shrimp - male weight
File: chloroth.mys  Transform: NO TRANSFORM

<table>
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<tr>
<th>t-test of Solvent and Blank Controls</th>
<th>Ho:GRP1 MEAN = GRP2 MEAN</th>
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</thead>
<tbody>
<tr>
<td>GRP1 (SOLVENT CRTL) MEAN = 0.6417</td>
<td>CALCULATED t VALUE = -3.1618</td>
</tr>
<tr>
<td>GRP2 (BLANK CRTL) MEAN = 0.8265</td>
<td>DEGREES OF FREEDOM = 48</td>
</tr>
<tr>
<td>DIFFERENCE IN MEANS = -0.1849</td>
<td></td>
</tr>
</tbody>
</table>

TABLE t VALUE (0.05 (2),60) = 2.000**  SIGNIFICANT DIFFERENCE at alpha=0.05
TABLE t VALUE (0.01 (2),60) = 2.660**  SIGNIFICANT DIFFERENCE at alpha=0.01
### Chlorothalonil: mysid shrimp - male weight

File: chloroth.mys  
Transform: NO TRANSFORM

#### SUMMARY STATISTICS ON TRANSFORMED DATA  
**TABLE 1 of 2**

<table>
<thead>
<tr>
<th>GRP</th>
<th>IDENTIFICATION</th>
<th>N</th>
<th>MIN</th>
<th>MAX</th>
<th>MEAN</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>solvent control</td>
<td>24</td>
<td>0.230</td>
<td>1.130</td>
<td>0.642</td>
</tr>
<tr>
<td>2</td>
<td>0.65 ug/L</td>
<td>25</td>
<td>0.460</td>
<td>0.980</td>
<td>0.691</td>
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<tr>
<td>3</td>
<td>0.83</td>
<td>22</td>
<td>0.460</td>
<td>0.970</td>
<td>0.694</td>
</tr>
<tr>
<td>4</td>
<td>1.2</td>
<td>29</td>
<td>0.410</td>
<td>0.880</td>
<td>0.617</td>
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<tr>
<td>5</td>
<td>3.0</td>
<td>24</td>
<td>0.440</td>
<td>1.300</td>
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<tr>
<td>6</td>
<td>5.7</td>
<td>29</td>
<td>0.480</td>
<td>0.970</td>
<td>0.711</td>
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</tbody>
</table>

#### SUMMARY STATISTICS ON TRANSFORMED DATA  
**TABLE 2 of 2**

<table>
<thead>
<tr>
<th>GRP</th>
<th>IDENTIFICATION</th>
<th>VARIANCE</th>
<th>SD</th>
<th>SEM</th>
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<td>0.231</td>
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<tr>
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<tr>
<td>4</td>
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<td>0.020</td>
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<tr>
<td>5</td>
<td>3.0</td>
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<td>0.033</td>
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<tr>
<td>6</td>
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<td>0.016</td>
<td>0.127</td>
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</tbody>
</table>

### Chlorothalonil: mysid shrimp - male weight

File: chloroth.mys  
Transform: NO TRANSFORM

#### WILLIAMS TEST (Isotonic regression model)  
**TABLE 1 OF 2**

<table>
<thead>
<tr>
<th>GROUP</th>
<th>IDENTIFICATION</th>
<th>N</th>
<th>ORIGINAL MEAN</th>
<th>TRANSFORMED MEAN</th>
<th>ISOTONIZED MEAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>solvent control</td>
<td>24</td>
<td>0.642</td>
<td>0.642</td>
<td>0.642</td>
</tr>
<tr>
<td>2</td>
<td>0.65 ug/L</td>
<td>25</td>
<td>0.691</td>
<td>0.691</td>
<td>0.664</td>
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<tr>
<td>3</td>
<td>0.83</td>
<td>22</td>
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<tr>
<td>4</td>
<td>1.2</td>
<td>29</td>
<td>0.617</td>
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<td>0.664</td>
</tr>
<tr>
<td>5</td>
<td>3.0</td>
<td>24</td>
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<td>0.736</td>
<td>0.722</td>
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<tr>
<td>6</td>
<td>5.7</td>
<td>29</td>
<td>0.711</td>
<td>0.711</td>
<td>0.722</td>
</tr>
</tbody>
</table>

#### WILLIAMS TEST (Isotonic regression model)  
**TABLE 2 OF 2**
<table>
<thead>
<tr>
<th>IDENTIFICATION</th>
<th>ISOTONIZED MEAN</th>
<th>CALC. WILLIAMS</th>
<th>SIG WILLIAMS P=.05</th>
<th>TABLE WILLIAMS</th>
<th>DEGREES OF FREEDOM</th>
</tr>
</thead>
<tbody>
<tr>
<td>solvent control</td>
<td>0.642</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0.65 mg/L</td>
<td>0.664</td>
<td>0.505</td>
<td>1.66</td>
<td>k= 1, v=147</td>
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<tr>
<td>0.83</td>
<td>0.664</td>
<td>0.488</td>
<td>1.73</td>
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<td>1.2</td>
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<td>0.523</td>
<td>1.75</td>
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<tr>
<td>3.0</td>
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<td>1.844</td>
<td>*</td>
<td>1.77</td>
<td>k= 4, v=147</td>
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<tr>
<td>5.7</td>
<td>0.722</td>
<td>1.929</td>
<td>*</td>
<td>1.77</td>
<td>k= 5, v=147</td>
</tr>
</tbody>
</table>

$s = 0.152$

Note: df used for table values are approximate when v > 20.

\[ \text{NOEC} = 1.2 \text{ mg/L} \]

\[ \text{LOEC} = 3.0 \text{ mg/L} \]