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OFFICE OF
PREVENTION, PESTICIDES,
AND TOXIC SUBSTANCES

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SUBJECT: Alachlor exposure assessment from acetochlor surface water monitoring study
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This memo describes an aquatic exposure assessment for alachlor generated from the alachlor data contained in the Acetochlor Registration Partnership's surface water monitoring study for acetochlor. This data is the first year's data (1995) in a five year study at 175 sites in 12 states: Delaware, Illinois, Indiana, Iowa, Kansas, Maryland, Minnesota, Missouri, Nebraska, Ohio, Pennsylvania, and Wisconsin. Samples were collected once every two weeks from April through September at each site. One more sample was collected at each site to represent the Fall and

Winter. Most sites have fourteen samples. Samples were unfiltered prior to analysis. The samples were analyzed using a GC/MS method.

The three different endpoints, annual peaks, 96 day time-weighted mean concentrations (TWMCs), and annual TWMCs, were calculated in the following manner. For the two TWMCs, two bounding values were calculated. The upper bound was calculated by substituting the detection limit for non-detects and the quantitation limit for values between the detection limit and the quantitation limit. The lower bound was calculated by substituting zero for non-detects and the detection limit for values between the detection limit and the quantitation limit. For the peak values, the detection limit is reported when there were no detects at the site during the year. Because the differences between the upper bound and lower bound estimates were very small, only the upper bound estimates have been reported. The weights for the TWMCs were calculated by taking the length of time from the previous measurement to the following measurement and dividing by 2. For the first and last measurements, the length of time between the first and second, and last and second to last was used as the weight respectively. The 96-day TWMCs were calculated by using a running TWMC through year and selecting the maximum from this running TWMC. Because samples were only taken every two weeks, in most cases, the running mean was calculated on a somewhat shorter time frame, usually 84 days.

The is data summarized in Figures 1-3. Figure 1 shows a site exceedance probability of the peak values at each site. This value should be used for comparison to acute toxicity tests and the 21 day *Daphnia* chronic study. Figure 2 is site exceedance probability of the maximum 96 day TWMCs at each site. A site exceedance probability plot for the annual TWMCs for each site is in Figure 3. This is the most appropriate endpoint for comparison to human lifetime health advisories.

The peak sample as well as the largest 96-day TWMC and largest annual TWMC were found at Defiance, Ohio. The peak concentration was just under 4 ug L^{-1}. Nine of the fourteen samples at Defiance contained detectable amounts of alachlor (detection limit - 0.02 ug L^{-1}). Farina, IL had detectable alachlor in every sample, though at lower levels than Defiance. Thirty-one sites had no detectable residues of alachlor in any sample. Overall, 558 of 2444 total samples had detectable alachlor, or 22.8%. Table 1 has the 90% site exceedance probabilities for the peak, 96 day TWMC , and annual TWMC.

Table 1. 90% site exceedance values for alachlor in the acetochlor surface water monitoring study in 1995

Peak	96 Day TWMC	Annual TWMC
---------- ug L^{-1} ----------		
0.37	0.17	0.10

This data has several strengths and weaknesses as compared to other monitoring studies. In general, there are more samples collected at each site and more sites than are found in most monitoring studies. Furthermore, the sites were selected to represent a range of agricultural intensities and size in the drainage basins. This is an advantage in a study of this size.
This study also has some limitations. All of the data was collected at drinking water facilities and used finished water. Water treatment may reduce the alachlor concentration somewhat, but the amount is not believed to be substantial. Drinking water facilities tend to be on larger streams, rivers, and lakes. Smaller rivers, streams, and lakes are probably have higher peak concentrations of alachlor, and may be somewhat more sensitive ecologically. Another limitation is that the samples were collected once every two weeks. No samples were collected in response to runoff events. This makes it likely that true peak values will be missed at each site. This single sample also is used for the 21 day average which also is not ideal but is the best that can be done with samples collected biweekly. Finally it should be noted that alachlor use has declined substantially from use in the recent past. While these concentrations are an accurate reflection of alachlor surface water concentrations in 1995 (given the limitations mentioned above), the potential market for alachlor is substantially larger, and there is a possibility that alachlor may reclaim some or all of its former share of the market if the conditions in the market were to change.

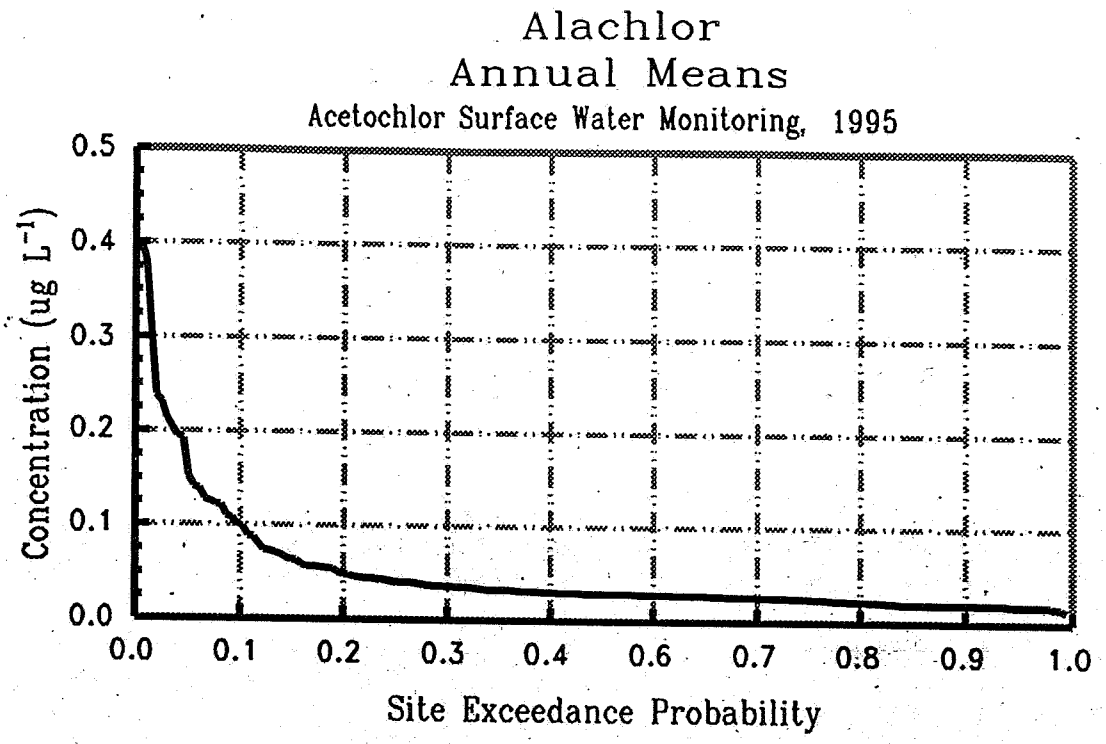

Figure 1.. Site exceedance probability of annual time-weighted concentrations of alachlor in the acetochlor surface water monitoring study in 1995.

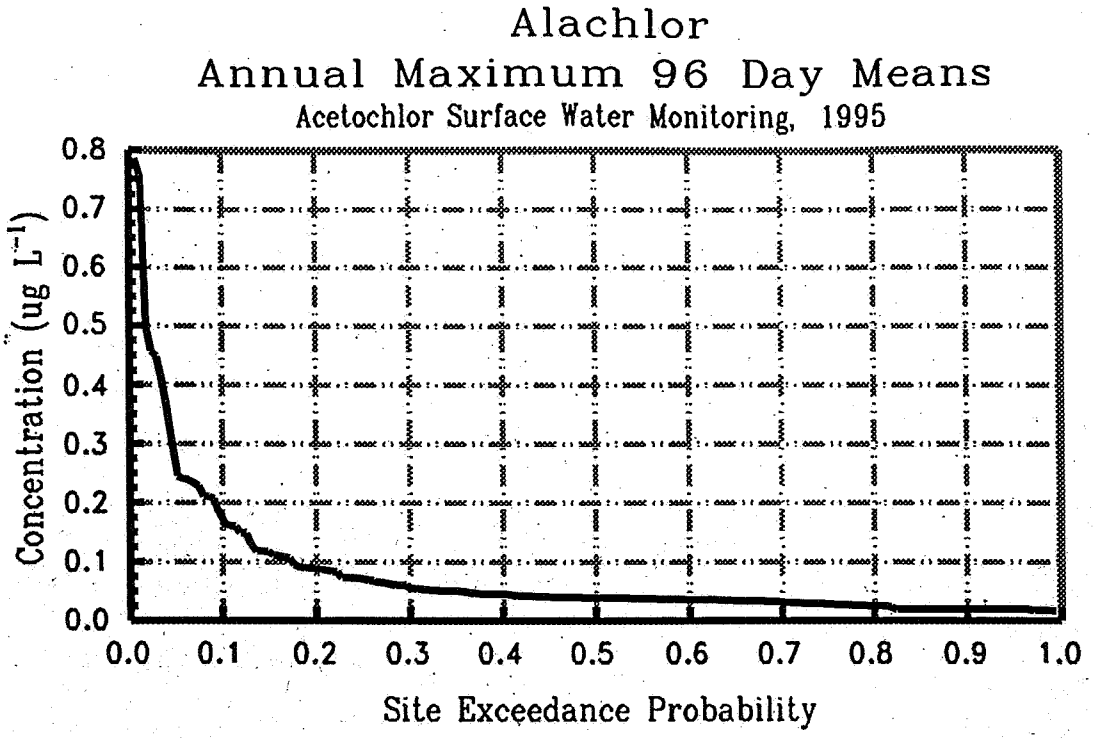

Figure 2.. Site exceedance probability of annual maximum 96 day mean concentrations of alachlor in the acetochlor surface water monitoring study in 1995.

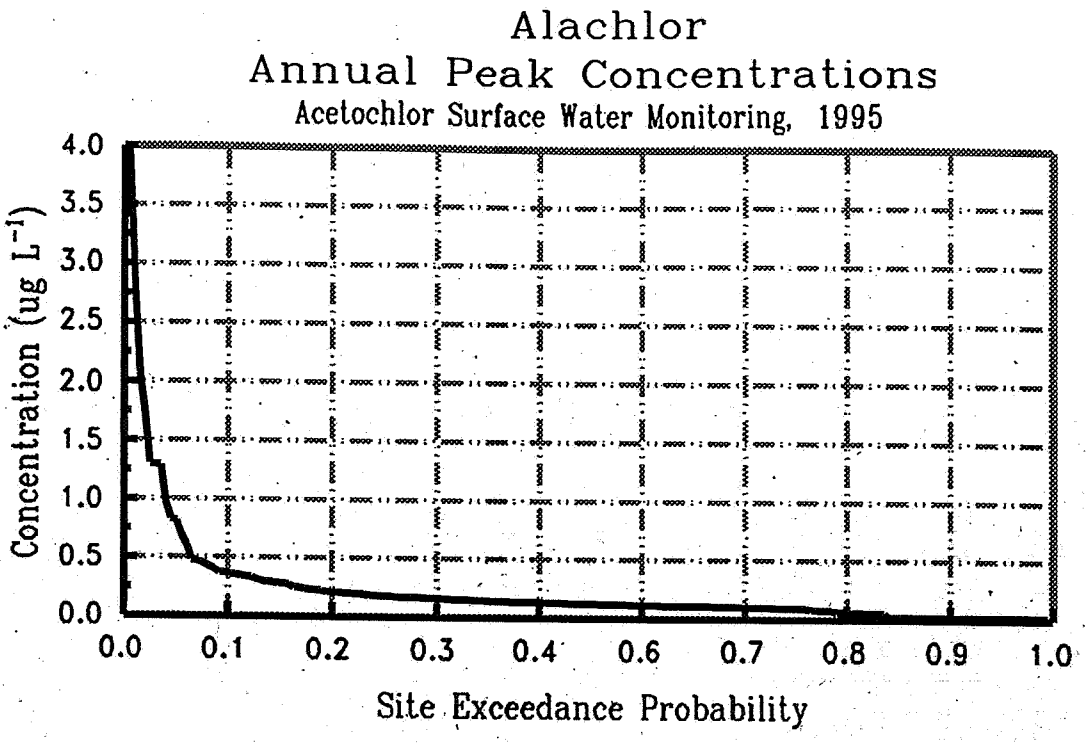

Figure 3.. Site exceedance probability of annual peak concentrations of alachlor in the acetochlor surface water monitoring study in 1995.

cc: Jose Melendez
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