APPENDIX B. Method for Calculating Equivalent Field Application Rate

Method for calculating application rate in lbs a.i./A from aqueous concentration (in mg/L):

1) CINTCP is a parameter used in PRZM that defines the maximum interception storage of the crop. This parameter estimates the amount of rainfall (in cm) that is intercepted by a fully developed plant canopy and retained on the plant surface. Therefore, this is assumed to be equivalent to the amount of irrigation water required for a crop. CINTCP values for crops with light, moderate and maximum canopy densities are listed in table 5-4 of the PRZM manual. The CINTCP for orchard is estimated as a conservative value of 0.40 cm. Example calculations for orchard are shown here.

2) To calculate the volume (cm^3) of irrigation water required for a 1 ha field (equivalent to $1E^8$ cm^2), the CINTCP value (cm) is multiplied by the area of the field. The result is then converted into units of L.

1×10^8 cm^2 x 0.4 cm = 4×10^7 cm^3

4×10^7 cm^3 /ha x (1 L/1000 cm^3) = 4×10^4 L/ha

3) The volume of irrigation water required for a 1 ha field is multiplied by the concentration of acrolein in the irrigation water (mg/L).This results in an estimate of the mass of acrolein (mg) applied to a 1 ha field.

4×10^4 L/ha x 15 mg/L = 6×10^5 mg/ha

4) The units of mg/ha are converted to lbs/A.

6×10^5 mg/ha x ha/2.47 A = 2.43×10^5 mg/A

2.43×10^5 mg/A x (1g/1000 mg) x (1kg/1000g) x (2.2 lb/ 1kg) = **0.534 lb/A**

Crop	CINTCP (cm)	Volume irrigation water (L) for 1 ha field	Max amount (mg) of acrolein applied to 1 ha	Application rate in mg/A	Application rate in lbs a.i./A
Orchard	0.4	4.00E+04	6.00E+05	2.43E+05	0.534
maximum canopy density (e.g. corn)	0.3	3.00E+04	4.50E+05	1.82E+05	0.401
Moderate canopy density (e.g.soybeans, cotton, tobacco)	0.25	2.50E+04	3.75E+05	1.52E+05	0.334
Light canopy density (e.g. potatoes, peanuts, barley)	0.15	1.50E+04	2.25E+05	9.11E+04	0.200