Appendix B: Directions EPA used to calculate downstream dilution and spraydrift.

Downstream Dilution	Spraydrift
Use Endangered Species LOC	Use Endangered Species LOC
Calculate the highest RQ/LOC ratio based on aquatic species endpoints (acute or chronic)– based on use with the maximum application rate and the <u>maximum</u> number of applications. Acute LOC for endangered animal species is 0.05; chronic is 1. Acute LOC for aquatic plants is 1.	Calculate the highest RQ/LOC ratio based on aquatic species AND terrestrial endpoints (acute or chronic) – based on use with the maximum application rate and <u>ONE</u> application. For terrestrial endangered species: acute LOC for birds is 0.1; for mammals is 0.1; for invertebrates is 0.05. Chronic LOC for all terrestrial animals is 1 and acute terrestrial plant LOC is 1.
Determine RQ/LOC ratio and identify the land use type that is associated with that use (conservative approach – apply that distance to all land use types have LOC exceedances) and apply to maps.	Use Agdrift (input one application) to determine maximum distance from initial area of concern to the point where LOC are no longer exceeded for that endpoint (conservative approach – apply that distance to all land use types that have LOC exceedances)
Final product – longest distance downstream from edge of initial area of concern where LOCs are no longer exceeded	Final product – longest spray drift distance from edge of initial area of concern where LOCs are no longer exceeded

Note: The guidance for spraydrift primarily applies to far field off-site transport in which it is reasonable to assume that a species would receive only one application exposure. It is recognized that close to the field a species could receive exposure from multiple applications. More information will follow regarding near field exposure.

EXAMPLE. Terrestrial Buffer and Downstream Dilution Analysis					
Taxa	**Use**	**EEC**	**Highest RQ**	**ES LOC/ Chronic LOC**	**Ratio RQ/ LOC**
Fish	Ornamentals	Acute 45.1 µg/L	75.2	0.05	1504
		Chronic 20 µg/L	201	1.0	201
Aquatic plant-nonvascular (use EC25 not NOAEC)	Ornamentals	45.1 µg/L	0.3	1.0	NA
Aquatic plant vascular	No LOC exceedances				
Aquatic invertebrates	Ornamentals	Acute 45.1 µg/L	752	0.05	15040 - use this for downstream dilution
		Chronic 25 µg/L	503	1.0	503
Birds – dietary based (no dose based risk)	Avocado	Acute/ Chronic -1076 ppm (small insect)	0.32	0.1	3.2
			12.7	1.0	12.7
Terrestrial Invertebrates	Avocado	1076 ppm (small insect)	9.2	0.05	184
Mammals	Avocado	Acute/Chronic 1823 mg/kg bw	0.31	0.1	3.1
			207	1.0	207 – use this for spray drift
Terr Plants	Avocado	0.05 lb a.i./A	1.3	1.0	1.3

Subset of Agdrift Directions - Calculate the "fraction of applied"

2) Calculate the distance from the field of application needed to be below an acute LOC:

- Under 'Calculations', enter "Initial Average Deposition" (lb/ac). To calculate the 'Initial Average Deposition', use the following:

- (Fraction of applied) x (Application rate)

- The 'fraction of applied' =

First, calculate RQs based on one application. Determine the highest RQ/LOC ratio for both aquatic and terrestrial species evaluating both the acute and chronic endpoints.

For Agdrift, calculate LOC/RQ

Example:

for carbofuran use on corn (ground application), the acute LOC for listed mammals is 0.1; the dose-based acute RQ calculated from T-REX, broadleaf food category, is 8.19 (for the corn application rate); therefore the 'fraction of applied' = 0.1/8.19 = 0.012

The 'Initial Average Deposition' is:

(Fraction of applied) x (Application rate for corn in lb a.i./acre) =

$$0.012 \times 1 = 0.012 \text{ lb a.i./ac}$$

- Once the 'Initial Average Deposition' is entered click the "calc" box and the "Distance to... Area Average From Edge of Application Area" will be shown in ft. This is how far off the field needed to be below the LOC.