

APPENDIX E

Nutrient Management Plan Based on Land Application Area for Compost Toilet Wastewater Irrigation

The purpose of determining the land application area is to ensure minimum movement of nitrogen from the specified area of application to surface and groundwaters where they can potentially have a detrimental effect on water quality. This is to ensure that there is sufficient land area based on the flow to ensure vegetative uptake of the nutrients. By completing this section of the NOI, you are helping to protect local waters and the Chesapeake Bay.

To complete the discharge information in Section III of the NOI, the applicant must determine the area required for Land Application of their compost toilet wastewater using the average gallons discharged per year (based on the sizing of the holding tank) and the average concentration of total nitrogen in the wastewater. Calculate the total nitrogen in lbs/year that will come from the discharge (X) using the model below. Then use the total nitrogen value to calculate the square feet required for the discharge (Z). Include this result in Section III of the NOI.

$$\text{Total N} = \frac{(\text{V}) \text{ gallons}}{\text{Year}} \times \frac{3.785 \text{ liters}}{\text{Gallon}} \times \frac{(\text{W}) \text{ mg}}{\text{liter}} \times \frac{\text{lb}}{453,592 \text{ mg}} \times (1 - 0.15) = (\text{X}) \text{ lbs/year}$$

Using the table on the next page, identify which vegetation will be discharged onto and use the associated Total Crop N Uptake Rate value in the equation below (Y). If you plan to discharge onto vegetation other than those listed in the table, contact the Department for additional Crop N Uptake Rates. With both the total nitrogen in lbs/year calculated in the above equation (X) and the Total Crop N Uptake Rate, the minimum amount of land that could safely absorb this amount of nitrogen each year is:

$$\text{Area Required} = \frac{(\text{X}) \text{ lbs}}{\text{Year}} \times \frac{\text{acre-year}}{(\text{Y}) \text{ lbs}} \times \frac{43,560 \text{ square feet}}{\text{acre}} = (\text{Z}) \text{ square feet}$$

Crop	Total Crop N Uptake Rate (lb/ac-yr)
Barley	59
Buckwheat	32
Corn	208
Oats	75
Rice	106
Rye	50
Sorghum	121
Wheat	70
Flax	78
Oil Palm	107
Peanuts	203
Rapeseed	332
Soybeans	221
Sunflower	159
Cotton	34
Pulpwood	0.1
Alfalfa	180
Bahiagrass	76
Big Bluestem	59
Birdsfoot Trefoil	149
Bluegrass-pasted	116
Bromegrass	187
Clover-grass	182
Dallisgrass	115
Guineagrass	250
Bermudagrass	301
Indiangrass	60
Lespedeza	140
Little Bluestem	66
Orchardgrass	176
Pangolagrass	260
Paragrass	172
Red Clover	100
Reed Canarygrass	176
Ryegrass	167
Switchgrass	69
Tall Fescue	138
Timothy	60
Wheatgrass	28