

The Annual Wastewater Discharge Limit Without Being Covered Under the Winery General Permit Should be Increased to 107,000 Gallons Per Year

Wineries that produce small volumes of wine also produce small volumes of wastewater that must be disposed of. When Ecology selected a wastewater discharge limit for wineries producing less than 7,500 cases of wine (17,835 gallons), a wastewater discharge limit of 53,500 gallons per year was also proposed. In the permit fact sheet, Ecology justified use of this value because some wineries have been able to operate at a wastewater generated per gallon of wine ratio of 3 to 1 (3:1). While a 3:1 ratio is an excellent goal, many small wineries operate at higher ratios. As a result, the de minimis annual limits proposed by Ecology (7,500 cases, 17,835 gallons of wine, 53,500 gallons of wastewater) will require many wineries with less than 7,500 case annual production to be required to apply for permit coverage because the wastewater limit is quite low.

The ratio of gallons wastewater per gallon of wine for wineries is reported to range from a ratio of (2:1) to as much as 10:1. Only the most water efficient and relatively large wineries can produce wine at a 2:1 wastewater to wine ratio. A common estimate of industry average wastewater production is 6:1. Use of this average ratio for winery planning is based on the performance of water efficient wineries, wineries that have just begun to implement water conservation practices, wineries that produce primarily red or primarily white wines, and wineries that do not crush and/or do not bottle.

While it is appropriate for Ecology to encourage wineries to improve water management practices and generate smaller amounts of wastewater, Ecology should not make permit limit decisions on this basis. The proper justification for a de minimis wastewater discharge limit should be based on assessment of potential environmental (groundwater impacts) of wastewater discharge.

An Example Potential Impacts Analysis. The following evaluation is offered to demonstrate that the potential impact of a larger wastewater discharge than 53,500 gallons per year is unlikely to cause groundwater impacts. Table 1 shows two wastewater discharge scenarios for a 7,500 case winery:

Table 1. Estimated Wastewater Volume for Wineries Producing 7,500 Cases per Year

Winery Annual Production		Wastewater to Wine Ratio	Wastewater Gallons per year
Cases	Gallons of wine		
7,500	17,835	6:1	107,000
7,500	17,835	3:1	53,500

The potential impact of the two wastewater volumes shown above are evaluated by calculating the wastewater loading impact for wastewater land application – it is likely that small wineries discharge to land, although some may use other discharge methods. Table 2 shows hydraulic loadings for the two discharge levels for a 7,500 case winery. This table shows that annual wastewater loadings, in inches, are low for applications to 1, 0.5, and 0.25 acres at both wastewater flow levels. While the loadings for the 3:1 ratio are lower than those for the 6:1 ratio, neither would overload a soil profile or subsurface discharge zone.

The analysis also shows estimated hydraulic loadings for both crush and non-crush seasons. These calculations show that non-crush loadings are very small, less than 1 inch per month, and would not present a threat to groundwater.

Table 2. Estimated Annual Wastewater Loading on 1 Acre, 0.5 Acres, and 0.25 Acres

Wastewater Gallons/year	Annual loading, inches applied to:			Crush Wastewater Flow ^a			Flow During Non-Crush (10 Months)		
	1 Acre	0.5 Acre	0.25 Acre	Inches per month			Inches per month		
				1 Acre	0.5 Acre	0.25 Acre	1 Acre	0.5 Acre	0.25 Acre
107,000	3.9	7.9	15.8	1.0	2.0	3.9	0.2	0.4	0.8
53,500	2.0	3.9	7.9	0.5	1.0	2.0	0.1	0.2	0.4

^a Assume a 2 month crush and fermentation season when 50% of annual discharge occurs.

The crush discharge flow, commonly in September and October are results in low loadings, less than 4 inches per month for all scenarios shown in the table. Climate conditions in late summer and fall are dry enough that, during crush, crop uptake will remove most of the applied water.

A final evaluation was made to demonstrate that discharge of 107,000 gallons of winery wastewater per year would not present a threat to groundwater quality. Table 3 shows estimated loading rates for three common constituents in winery wastewater, based on the concentrations shown at the bottom of the table. BOD loadings are shown for the crush season when concentrations are highest. The BOD loading levels are significantly lower than the loading rates used elsewhere in the Draft Winery General Permit. The nitrogen and salts (expressed as Total Dissolved Solids or Fixed Dissolved Solids) are shown as annual loadings. The nitrogen loadings are in the range of agronomic rates for forage and hay crops.

Table 3. Wastewater Constituent Loading on 0.5 Acres

Constituent Loading on 0.5 Acres ^a			
Wastewater Gallons/year	Crush BOD Pounds/Ac/Day	Total N Pounds/Ac/Year	FDS/TDS Pounds/Ac/Year
107,000	74	89	1,780
53,500	37	45	890
<i>Concentration, mg/L</i>	<i>5,000</i>	<i>50</i>	<i>1,000</i>

^a Constituent loadings are based on the concentrations shown at the bottom of the table and the hydraulic loadings in Table 2. Loadings for 1 acre and 0.25 acres can be calculated by dividing or multiplying by 2.

Summary. This analysis demonstrates the low potential for environmental impacts when small wineries discharge wastewater to land. The primary justification for this is that the low hydraulic loadings allow applied wastewater to remain in the soil for a sufficient amount of time to allow root zone treatment and crop uptake of applied wastewater constituents. Many Washington wineries are in the drier climate zones and would have a low potential to impact underlying groundwater. In wetter climates, more careful land application may be required during the fall but would still result in a low potential for groundwater impacts.

A small winery that commits 0.25 to 1 acres of land for wastewater discharge would present a low environmental risk of causing soil or groundwater impacts. Ecology should adopt the higher discharge limit evaluated here so that small wineries that do not pose a risk to groundwater quality will not be forced to apply for General Permit coverage.