

Eagle Mountain BMP's

Phosphorus Removal Calculated externally of SWAT

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Phase II Urban Stormwater

- 1991 EPA economic evaluation of the Phase II stormwater rule found that the cost of the program is between \$0.04 - \$0.18/lb of TSS and the efficiency ranges from 20% to 80%.
- Urban sediment load from SWAT, 26,382 tons/yr or 9% of total loading
- We assumed 50% efficiency
- Nutrient removal was proportional to TSS from SWAT output.
- \$1,793,994 for 4% TSS and 8% TP.

Wetland Development

- Site on West Fork and Walnut Creek immediately above Eagle Mountain
- Assume that the wetland could only treat 10% of the annual inflow
- Assume removal efficiency of TSS of 75%, TN of 50% and TP of 35%.
- Assume wetland is 1.5 feet deep and has a detention time of 7 days.

Wetland Development on West Fork and Walnut Creek

	<u>Percent Reduction in Annual Loading</u>			Area Required at
	<u>Sediment</u>	<u>TN</u>	<u>TP</u>	<u>1.5 ft depth</u>
West Fork (Subbasin 96)	5.50%	4.17%	2.76%	122.31
Walnut Creek (Subbasin 138)	0.70%	0.41%	0.44%	8.34

P Inactivation with Alum

- Treat main body of Eagle Mountain (WASP 1 and 2) 3655 surface acres.
- Alum combines with P and makes it unavailable to algae
- 750 gallons/acre at \$1.25 gallon (Osgood)
- \$3,426,562
- Flux in WASP is 8271 kg/yr
- Assume 68% removal efficiency or 5624 kg/yr of TP will be removed from Eagle Mountain Lake.

Hypolimnetic Aeration

- Based on an aerated hypolimnion will not flux P from the sediment
- BB and BP systems installed this year at about \$175,000 for capital and annual O&M.
- Treat about 310 acres at Eagle Mountain
- Sequester 918 kg/yr of TP

Preliminary Cost Comparison

BMP	Cost	Annual TP Removal	Cost / % Removal
Phase II Urban Stormwater	\$1,793,994	8%	\$225,000
West Fork Wetland ¹	\$610,000	2.76%	\$220,000
Walnut Ck Wetland ¹	\$50,000	0.44%	\$115,000
Alum Treatment	\$3,426,562	3.25%	\$1,055,000
Hypolimnetic aeration	\$175,000	0.53%	\$330,000

1. Assume cost of land at \$5000/acre. No other costs included.