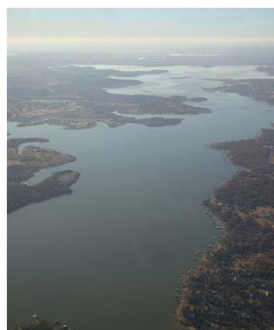


## Initial Economic Assessment of BMPs for Improved Water Quality in the Eagle Mountain Watershed

- **Review of BMPs**
- **Assumed Adoption Levels**
- **Implementation Costs**
- **Ranking of BMPs**
- **Cost-Effective BMP Suite**



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### BMPs and Eligibility within Eagle Mountain Watershed

	<b>Eligibility in Watershed</b>
1 Conversion of Cropland to Grass/Hay	17,509 acres
2 Fert. Mgt. 25% red. In P, split applications	17,509 acres
3 Establish Filter Strips	17,509 acres
4 Establish Grassed Waterways	3,503 acres
5 Terracing	8,646 acres
6 Prescribed Grazing	50,162 acres
7 Pasture Planting – reseeded	50,162 acres
8 Critical Pasture Planting – shaping	190,580 acres
9 Grade Stabilization – gully plugs	203,703 acres
10 Prescribed Burning	64,247 acres
11 Brush Management	32,123.5 acres
12 Phase II Urban Stormwater BMPs	1 project

## BMPs and Eligibility within Eagle Mountain Watershed

		Eligibility in Watershed
13	Voluntary Urban Nutrient Mgt.	1 project
14	Required Urban Nutrient Mgt.	1 project
15	Herbicide Application – Riparian Corridor	49.5 miles
16	Riparian Buffer Strips – Med. Erosion Areas	288.3 miles
17	Riparian Buffer Strips – Critical Areas	52.2 miles
18	Wetland Development – West Fork Trinity	1 project – 302.1 acres
19	Wetland Development – Walnut Creek	1 project – 20.6 acres
20	Hypolimnetic Aeration	1 project
21	P Inactivation with Alum	1 project
22	WWTP – Level I to Level II	ALL WWTPs
23	WWTP – Level I to Level III	ALL WWTPs
24	FP Sites – New Ponds Big Sandy/Salt Creek	1 project – 13/4 ponds

BMP	Description	Reduction In:		
		Total P	Total N	Sediment
1	Conversion of Cropland to Grass/Hay	15.20%	7.30%	14.20%
2	Fert. Mgt. - 25% reduced P application	1.20%	-0.20%	0.00%
3	Establish Filter Strips	12.70%	5.00%	13.00%
4	Establish Grassed Waterways	3.10%	0.20%	3.80%
5	Terracing	6.80%	2.50%	7.10%
6	Prescribed Grazing	1.70%	0.30%	0.50%
7	Pasture Planting - reseeding	1.70%	0.30%	0.50%
8	Critical Pasture Planting - shaping	1.50%	4.60%	1.80%
9	Grade Stabilization - gully plugs	4.00%	2.80%	4.30%
10	Prescribed Burning	1.80%	0.50%	1.10%
11	Brush Management	1.70%	0.30%	1.10%
12	Phase II Urban Stormwater BMPs	8.00%	0.00%	4.00%
13	Voluntary Urban Nutrient Mgt.	8.69%	6.61%	0.00%
14	Required Urban Nutrient Mgt.	5.10%	0.70%	-4.60%
15	Herbicide Application - Riparian corridor	1.70%	0.30%	1.10%
16	Riparian Buffer Strips - Med Erosion Areas	0.40%	0.30%	4.10%
17	Riparian Buffer Strips - Critical Areas	1.60%	1.30%	14.30%
18	Wetland Development - West Fork Trinity	2.76%	4.17%	5.50%
19	Wetland Development - Walnut Creek	0.44%	0.41%	0.70%
20	Hypolimnetic Aeration	0.53%	0.00%	0.00%
21	P Inactivation with Alum	3.25%	0.00%	0.00%
22	WWTP - Level I to Level II	0.30%	-0.20%	0.00%
23	WWTP - Level I to Level III	0.60%	0.30%	0.00%
24	Flood Protection Sites - Big Sandy/Salt Creek	4.40%	5.20%	5.00%

## Adoption Rates of BMPs

		Adoption Rates			
		Current	Feasible	Likely	Marginal
1	Conversion of Cropland to Grass/Hay	0%	50%	25%	25%
2	Fert. Mgt. 25% red. In P, split applications	90%	100%	100%	10%
3	Establish Filter Strips	0%	50%	25%	25%
4	Establish Grassed Waterways	20%	60%	30%	10%
5	Terracing	20%	60%	30%	10%
6	Prescribed Grazing	10%	50%	30%	20%
7	Pasture Planting – reseeded	5%	20%	10%	5%
8	Critical Pasture Planting – shaping	30%	75%	40%	10%
9	Grade Stabilization – gully plugs	25%	75%	50%	25%
10	Prescribed Burning	1%	15%	5%	4%
11	Brush Management	10%	60%	30%	20%
12	Phase II Urban Stormwater BMPs	0%	100%	50%	50%

## Adoption Rates of BMPs

		Adoption Rates			
		Current	Feasible	Likely	Marginal
13	Voluntary Urban Nutrient Mgt.	10%	25%	15%	5%
14	Required Urban Nutrient Mgt	10%	80%	70%	60%
15	Herbicide Application – Riparian Corridor	0%	10%	5%	5%
16	Riparian Buffer Strips – Med. Erosion Areas	5%	50%	10%	5%
17	Riparian Buffer Strips – Critical Areas	0%	10%	10%	10%
18	Wetland Development – West Fork Trinity	0%	100%	100%	100%
19	Wetland Development – Walnut Creek	0%	100%	100%	100%
20	Hypolimnetic Aeration	0%	100%	100%	100%
21	P Inactivation with Alum	0%	100%	100%	100%
22	WWTP – Level I to Level II	0%	100%	100%	100%
23	WWTP – Level I to Level III	0%	100%	100%	100%
24	FP Sites – New Ponds Big Sandy/Salt Creek	0%	100%	100%	100%

### Initial Estimates – Ranking of BMPs

	Annual \$ per kg. of P reduced	
3	Establish Filter Strips	\$6.39
4	Establish Grassed Waterways	\$9.65
9	Grade Stabilization – gully plugs	\$14.92
15	Herbicide Application – Riparian Corridor	\$15.37
14	Required Urban Nutrient Mgt.	\$27.06
5	Terracing	\$53.39
1	Conversion of Cropland to Grass/Hay	\$55.31
20	Hypolimnetic Aeration	\$62.43
10	Prescribed Burning	\$72.62
21	P Inactivation with Alum	\$110.92
24	FP Sites – New Ponds Big Sandy/Salt Creek	\$204.82
7	Pasture Planting	\$209.35

### Initial Estimates – Ranking of BMPs

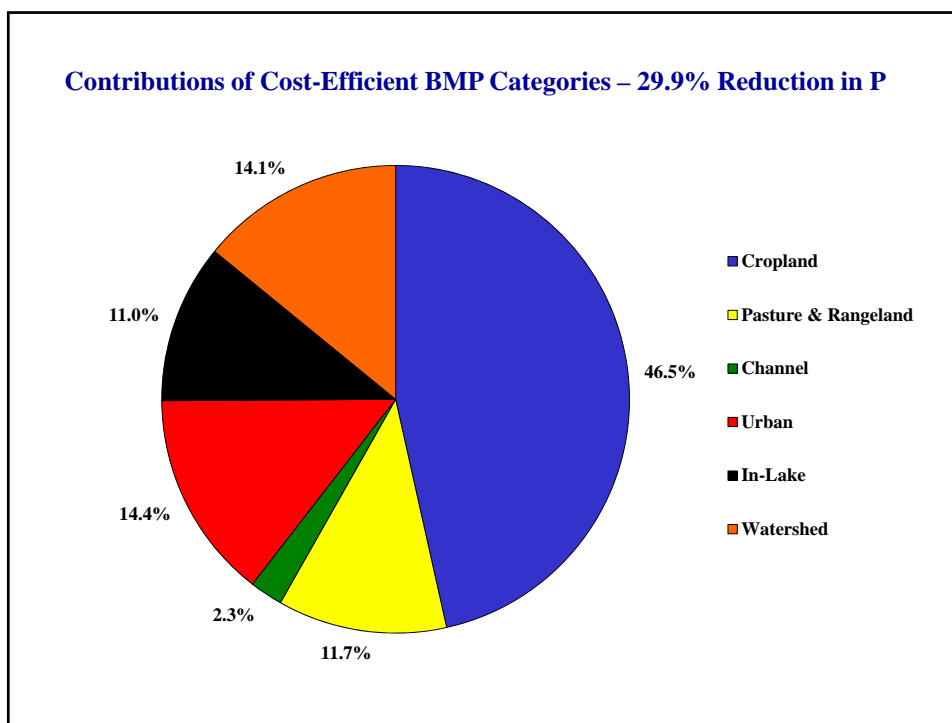
	Annual \$ per kg. of P reduced	
6	Prescribed Grazing	\$215.65
11	Brush Management	\$285.78
18	Wetland Development – West Fork Trinity	\$298.97
13	Voluntary Urban Nutrient Mgt.	\$389.18
22	WWTP – Level I to Level II	\$416.69
12	Phase II Urban Stormwater BMPs	\$421.33
2	Fert. Mgt. 25% red. In P, split applications	\$441.45
19	Wetland Development – Walnut Creek	\$538.23
17	Riparian Buffer Strips – Critical Areas	\$998.83
8	Critical Pasture Planting – shaping	\$1,005.37
23	WWTP – Level I to Level III	\$1,153.13
16	Riparian Buffer Strips – Med. Erosion Areas	\$1,431.70

**Table 4. Estimated Net Present Values of Costs for Best Management Practice Implementation with respect to Eligible Area within the Eagle Mountain Lake Watershed.**

BMP	Description	Net Present Value of Costs		
		Initial Construction and Establishment	Operating and Maintenance	Total
1	Conversion of Cropland to Grass/Hay	\$ 798,323	\$ 6,753,608	\$ 7,551,931
2	Fert. Mgt. - 25% reduced P application	\$ 16,500	\$ 1,886,831	\$ 1,903,331
3	Establish Filter Strips	\$ 45,619	\$ 682,923	\$ 728,542
4	Establish Grassed Waterways	\$ 26,152	\$ 81,377	\$ 107,529
5	Terracing	\$ 328,991	\$ 975,376	\$ 1,304,367
6	Prescribed Grazing	\$ 406,058	\$ 2,228,347	\$ 2,634,405
7	Pasture Planting - reseeded	\$ 33,053	\$ 606,289	\$ 639,342
8	Critical Pasture Planting - shaping	\$ 527,812	\$ 4,890,527	\$ 5,418,340
9	Grade Stabilization - gully plugs	\$ 336,654	\$ 199,559	\$ 536,213
10	Prescribed Burning	\$ 54,672	\$ 133,202	\$ 187,874
11	Brush Management	\$ 1,015,906	\$ 2,475,168	\$ 3,491,074
12	Phase II Urban Stormwater BMPs	\$ 0	\$60,553,355	\$60,553,355
13	Voluntary Urban Nutrient Mgt.	\$ 0	\$ 6,075,608	\$ 6,075,608
14	Required Urban Nutrient Mgt.	\$ 275,000	\$ 2,700,270	\$ 2,975,270
15	Herbicide Application - Riparian corridor	\$ 7,187	\$ 39,758	\$ 46,945
16	Riparian Buffer Strips - Med Erosion Areas	\$ 396,413	\$ 632,392	\$ 1,028,804
17	Riparian Buffer Strips - Critical Areas	\$ 5,742,000	\$ 0	\$ 5,742,000
18	Wetland Development - West Fork Trinity	\$18,418,950	\$11,228,898	\$29,647,848
19	Wetland Development - Walnut Creek	\$ 4,598,000	\$ 3,910,867	\$ 8,508,867
20	Hypolimnetic Aeration	\$ 165,000	\$ 1,023,892	\$ 1,188,892
21	P Inactivation with Alum	\$ 3,769,218	\$ 9,183,383	\$12,952,601
22	WWTP - Level I to Level II	\$ 1,132,681	\$ 3,358,762	\$ 4,491,444
23	WWTP - Level I to Level III	\$11,680,418	\$13,178,438	\$24,858,856
24	Flood Protection Sites - Big Sandy/Salt Creek	\$13,396,130	\$18,983,911	\$32,380,041

### Cost-Effective BMP Strategy for P Reduction

BMP	Description	Initial Estimated Standards			Cumulative Reduction Percentages	Cumulative Net Present Value	Cumulative Annuity Equivalent Value
		Total P	Total N	Sediment			
		173,020	1,055,220	296,400			
		kg.	kg.	tons			
		Total P	Total N	Sediment			
3	Establish Filter Strips	3.9%	2.3%	5.7%	\$ 728,542	\$ 35,083	
4	Establish Grassed Waterways	5.7%	2.3%	5.7%	\$ 836,071	\$ 40,261	
9	Grade Stabilization - gully plugs	7.8%	3.5%	7.0%	\$ 1,372,284	\$ 66,083	
15	Herbicide Application - Riparian corridor	8.5%	5.6%	9.6%	\$ 1,419,229	\$ 68,344	
14	Required Urban Nutrient Mgt.	12.3%	6.1%	8.1%	\$ 4,394,499	\$ 211,619	
5	Terracing	14.0%	6.3%	8.5%	\$ 5,698,866	\$ 274,431	
1	Conversion of Cropland to Grass/Hay	20.5%	7.2%	10.6%	\$13,250,797	\$ 638,098	
10	Prescribed Burning	21.3%	7.3%	10.8%	\$13,438,671	\$ 647,145	
21	P Inactivation with Alum	24.6%	7.3%	10.8%	\$26,391,272	\$1,270,883	
24	Flood Protection Sites - Big Sandy/Salt Creek	28.8%	12.3%	14.9%	\$58,771,313	\$2,830,158	
7	Pasture Planting - reseeded	29.1%	12.4%	15.0%	\$59,410,655	\$2,860,946	
6	Prescribed Grazing	29.1%	12.4%	15.0%	\$62,045,060	\$2,987,807	
11	Brush Management	29.4%	11.1%	15.3%	\$65,536,134	\$3,155,921	
13	Voluntary Urban Nutrient Mgt.	29.9%	11.5%	15.3%	\$71,611,742	\$3,448,495	
	<b>TOTALS</b>	29.9%	11.5%	15.3%	\$71,611,742	\$3,448,495	



### **Observations Concerning Implementation of BMP's**

- Reliance on Participation from Multiple Entities
- Funding for BMP Implementation
- Relative Cost Efficiency of BMPs
- Impact of Adoption Rates
- Coordination of Watershed Management Plans



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