

Comparison of Existing and Potential Future Stormwater Management Standards

Minnehaha Creek Watershed District

February 2008

Discharge Rate (cfs)

	Existing Site (Meadow)	Existing Site (Ag)	Post-development, untreated	Current Rule N	No Degradation
	1-yr	1-yr	1-yr	1-yr	1-yr
10 acre Residential, 1/3 ac Lot	0.2	3.6	4.7	3.6	3.6
10 acre Commercial, new 80% imp.	0.2	3.6	23.4	3.6	3.6
10 acre Commercial, 60% imp --> 80%	0.2	9.1	23.4	9.1	3.6

No ag - 60% imp w/grass

Existing land use and "non-degradation"
land use (1988) are assumed to be the same

	Existing Site (Meadow)	Existing Site (Ag)	Post-development, untreated	Current Rule N	No Degradation
	10-yr	10-yr	10-yr	10-yr	10-yr
10 acre Residential, 1/3 ac Lot	3.7	13.8	19.6	13.8	13.8
10 acre Commercial, new 80% imp.	3.7	13.8	47.2	13.8	13.8
10 acre Commercial, 60% imp --> 80%	3.7	23.9	47.2	23.9	13.8

	Existing Site (Meadow)	Existing Site (Ag)	Post-development, untreated	Current Rule N	No Degradation
	100-yr	100-yr	100-yr	100-yr	100-yr
10 acre Residential, 1/3 ac Lot	10.4	25.6	37.0	25.6	25.6
10 acre Commercial, new 80% imp.	10.4	25.6	70.1	25.6	25.6
10 acre Commercial, 60% imp --> 80%	10.4	39.3	70.1	39.3	25.6

Total Phosphorus Export (lb/yr)								
	Existing (Meadow)	Existing (ag, P8)	Existing (ag, Scott Cty)	Post-development, untreated	Current Rule N	1/2" Abstraction	1" Abstraction	No Degradation
10 acre Residential, 1/3 ac Lots	1.0	2.7	10	7.5	3.4	2.3	1.1	10
10 acre Commercial, new 80% imp.	1.0	2.7	10	19	7.7	4.4	1.4	10
10 acre Commercial, 60% imp --> 80%	1.0	13.8	13.8	19	15.8	14.7	13.9	10

Initial 60% imp built after 1988 and ag was present in 1988

Discharge Volume (ac-ft/yr)								
	Existing (Meadow)	Existing (ag & Scott Cty)	Post-development, untreated	Current Rule N	1/2" Abstraction	1" Abstraction	No Degradation	
10 acre Residential, 1/3 ac Lots	1.7	3.3	8.6	8.6	3.8	2	3.3	
10 acre Commercial, new 80% imp.	1.7	3.3	20.8	20.8	7.3	3	3.3	
10 acre Commercial, 60% imp --> 80%	1.7	15.2	20.8	20.8	16.9	15.7	3.3	

Costs of Each Set of Rules

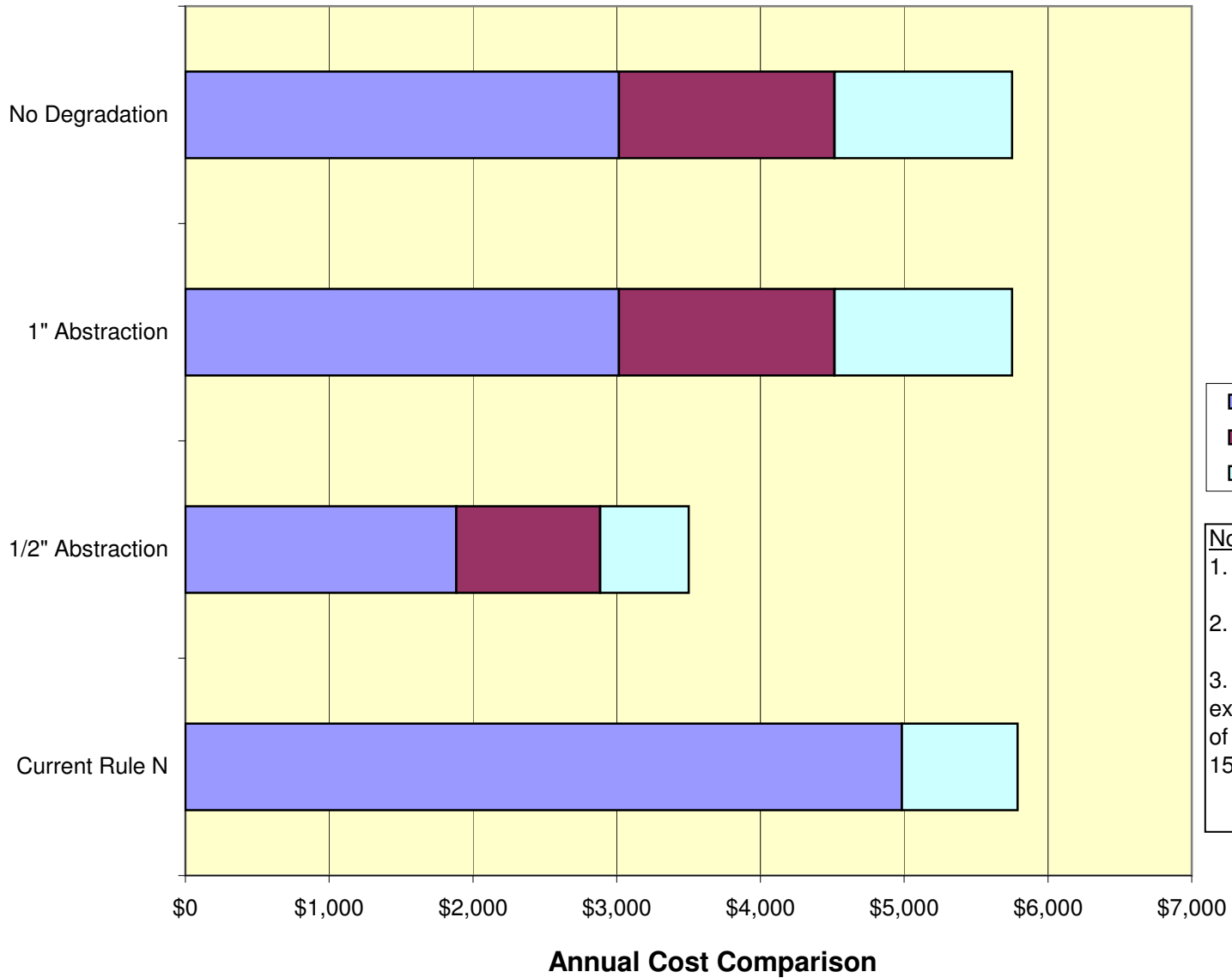
Design								
Engineering	\$0	\$0			\$5,000	\$5,000	\$5,000	\$5,000
Permitting	\$0	\$0			\$1,000	\$1,000	\$1,000	\$1,000

Construction								
Land	\$0	\$0			\$25,000	\$5,000	\$10,000	\$10,000
Labor & Materials	\$0	\$0			\$28,500	\$11,500	\$20,000	\$20,000

Maintenance								
Annual	\$0	\$0			\$0	\$1,000	\$1,500	\$1,500
15-years	\$0	\$0			\$15,000	\$11,500	\$23,000	\$23,000

Annual Costs								
Design and Construction	\$0	\$0			\$4,984	\$1,885	\$3,016	\$3,016
Maintenance	\$0	\$0			\$0	\$1,000	\$1,500	\$1,500
Future Maintenance	\$0	\$0			\$806	\$618	\$1,237	\$1,237
Annual Cost over 15 years					\$5,791	\$3,503	\$5,752	\$5,752

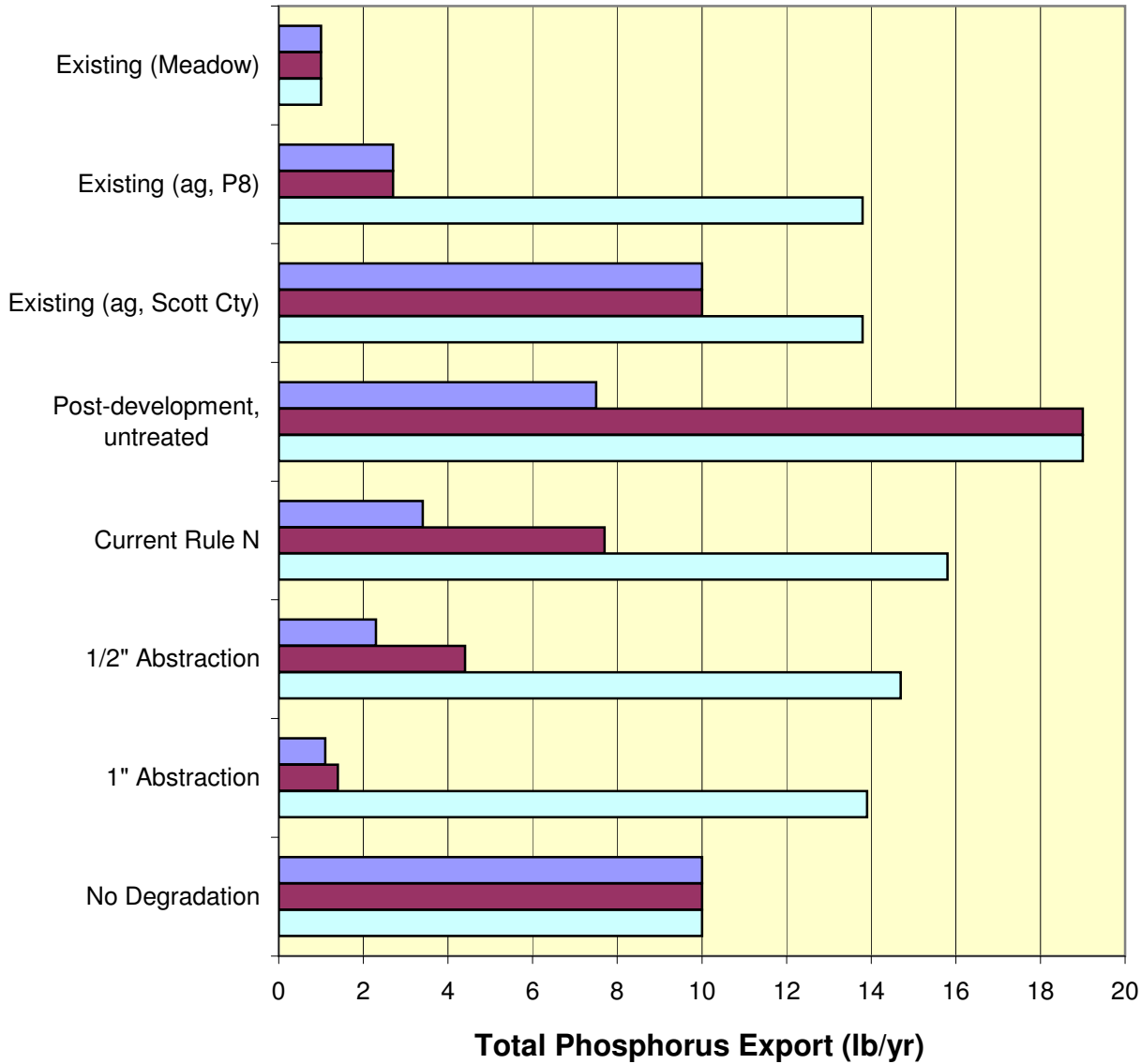
Interest Rate 3%
 Years 15
 Land (\$/acre) \$50,000



- Design and Construction
- Maintenance
- Future Maintenance

Notes

1. Land cost = \$50,000/ac
2. Interest rate = 3%
3. Future Maintenance = excavation of pond or rebuild of infiltration facilities every 15 years



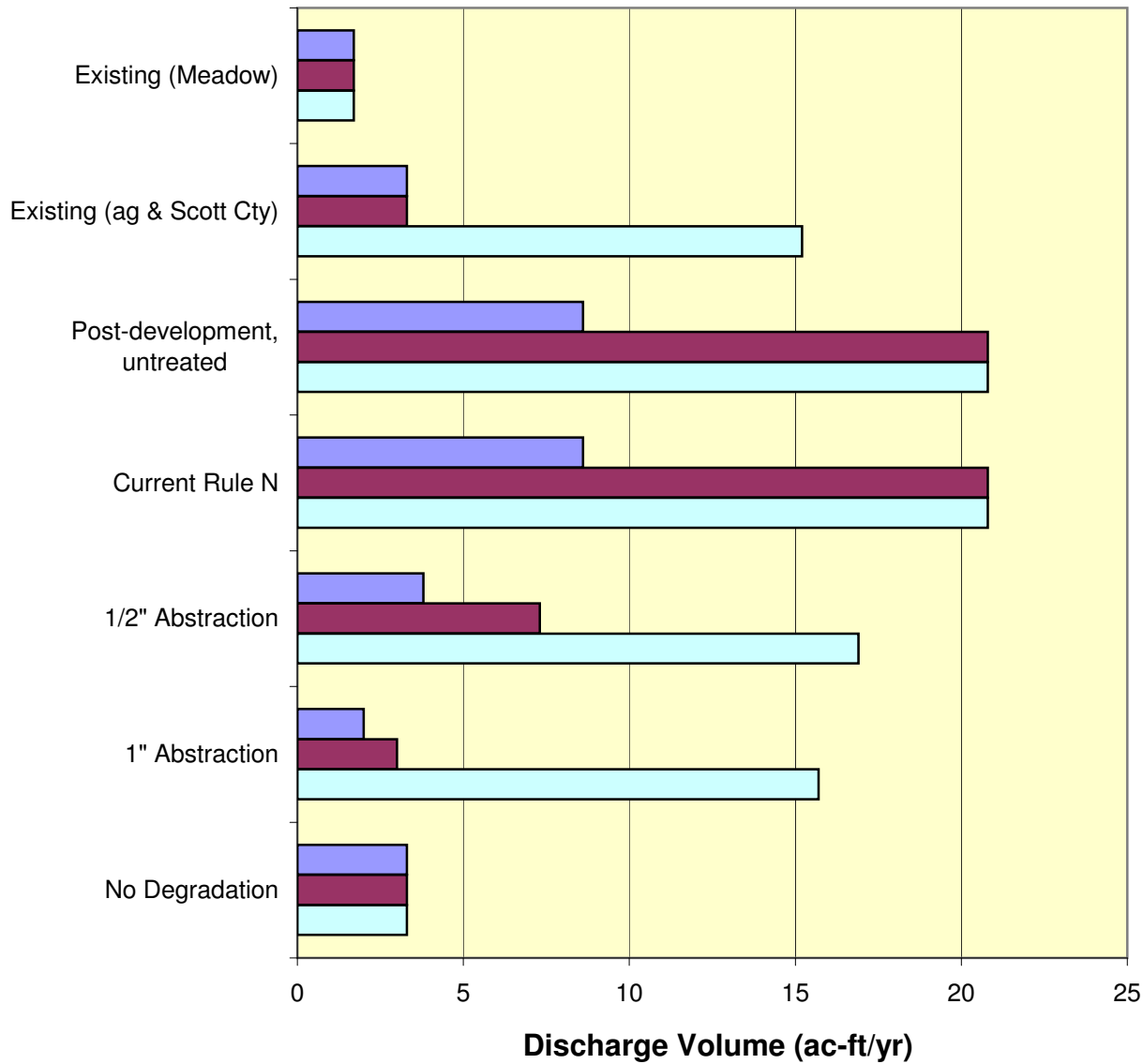
- 10 acre Residential, 1/3 ac Lots
- 10 acre Commercial, new 80% imp.
- 10 acre Commercial, 60% imp --> 80%

Notes

1. The P8 computer model was used to calculate all loading except the "Existing (ag, Scott Cty)" category. P8 was designed for use in urban areas. Therefore, literature values for agricultural runoff from Scott County was reported.

2. The 10 acre commercial site with 60% impervious assumes the rest of the site is grass for "Existing (ag)" conditions.

3. The "No Degradation" condition for the 10 acre commercial site with 60% impervious assumes the impervious is constructed after 1988. Agricultural use is considered present in 1988. The value reported is based on that reported by Scott County.



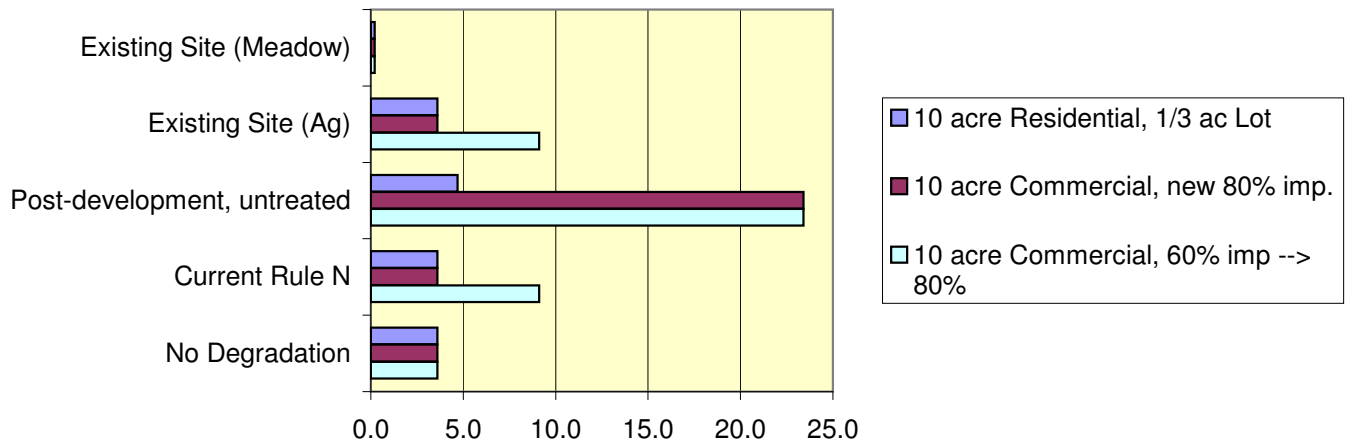
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Notes

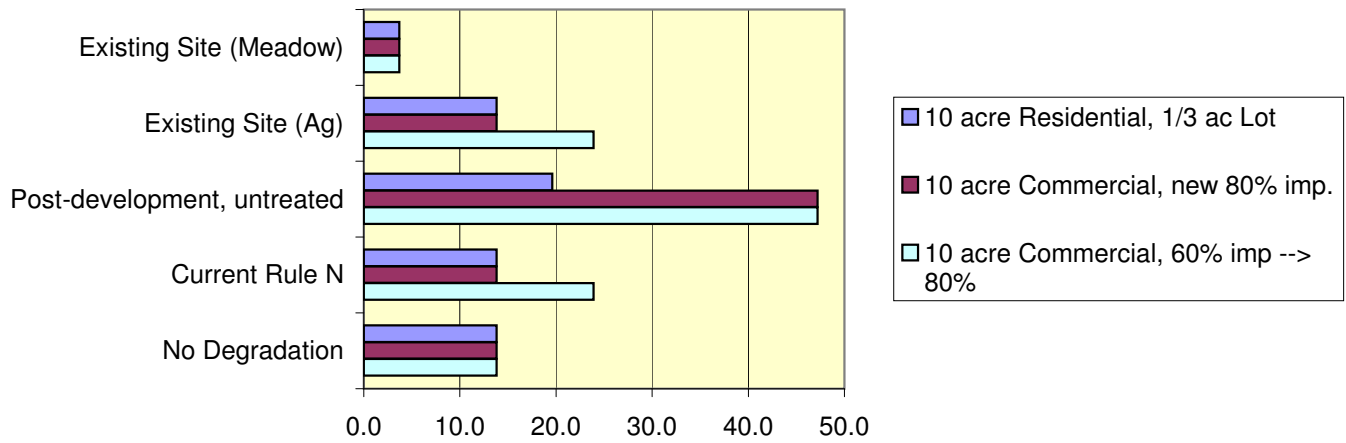
1. The 10 acre commercial site with 60% impervious assumes the rest of the site is grass for "Existing (ag)" conditions.

2. 1" and 1/2" Abstraction conditions consider complete infiltration from all runoff from impervious areas for the 1-inch and 1/2-inch rainfall depths, respectively.

1-year Runoff Requirement (cfs)



10-year Runoff Requirement (cfs)



100-year Runoff Requirement (cfs)

