

Table A-5				
Approved CBP BMP Efficiency Rates for Retrofit Analysis ^{1, 2, 3}				
URBAN BMP		Total Nitrogen	Total Phosphorus	TSS
		MASS LOAD REDUCTION (%)		
Wet Ponds and Constructed Wetlands		20	45	60
Dry Detention Ponds		5	10	10
Dry Extended Detention Ponds		20	20	60
Infiltration		80 (85) ⁴	85	95
Filtering Practices (Sand Filters)		40	60	80
Bioretention	C & D w/UD	25	45	55
	A & B w/ UD	70	75	80
	A & B w/o UD	80	85	90
Permeable Pavement	C & D w/UD	10 (20)	20	55
	A & B w/ UD	45 (50)	50	70
	A & B w/o UD	75 (80)	80	85
Grass Channels	C & D w/o UD	10	10	50
	A & B w/o UD	45	45	70
Bioswale	aka dry swale	70	75	80

¹ In many cases, removal rates have been discounted from published rates to account for poor design, maintenance and age, and apply to generally practices built prior to 2008
² Current Practices are designed to more stringent design and volumetric criteria, and may achieve higher rates –see Table A-4
³ Some practices, such as forest conservation, impervious cover reduction, tree planting are modeled as a land use change. Urban stream restoration is modeled based on a reduction per linear foot of qualifying stream restoration project
⁴ Numbers in parentheses reflect design variation with a stone sump to improve long term infiltration rates

A quick glance at Table A-5 reveals that the rates for ponds and wetlands tend to be fairly conservative, which reflects the concern that ideal or initial removal rates should be discounted due to real world implementation issues such as poor design, installation and maintenance, or simply the age of the practice. The removal rates for newer LID practices, by contrast, is not discounted.

Retrofit Dry Detention to Extended Dry Detention

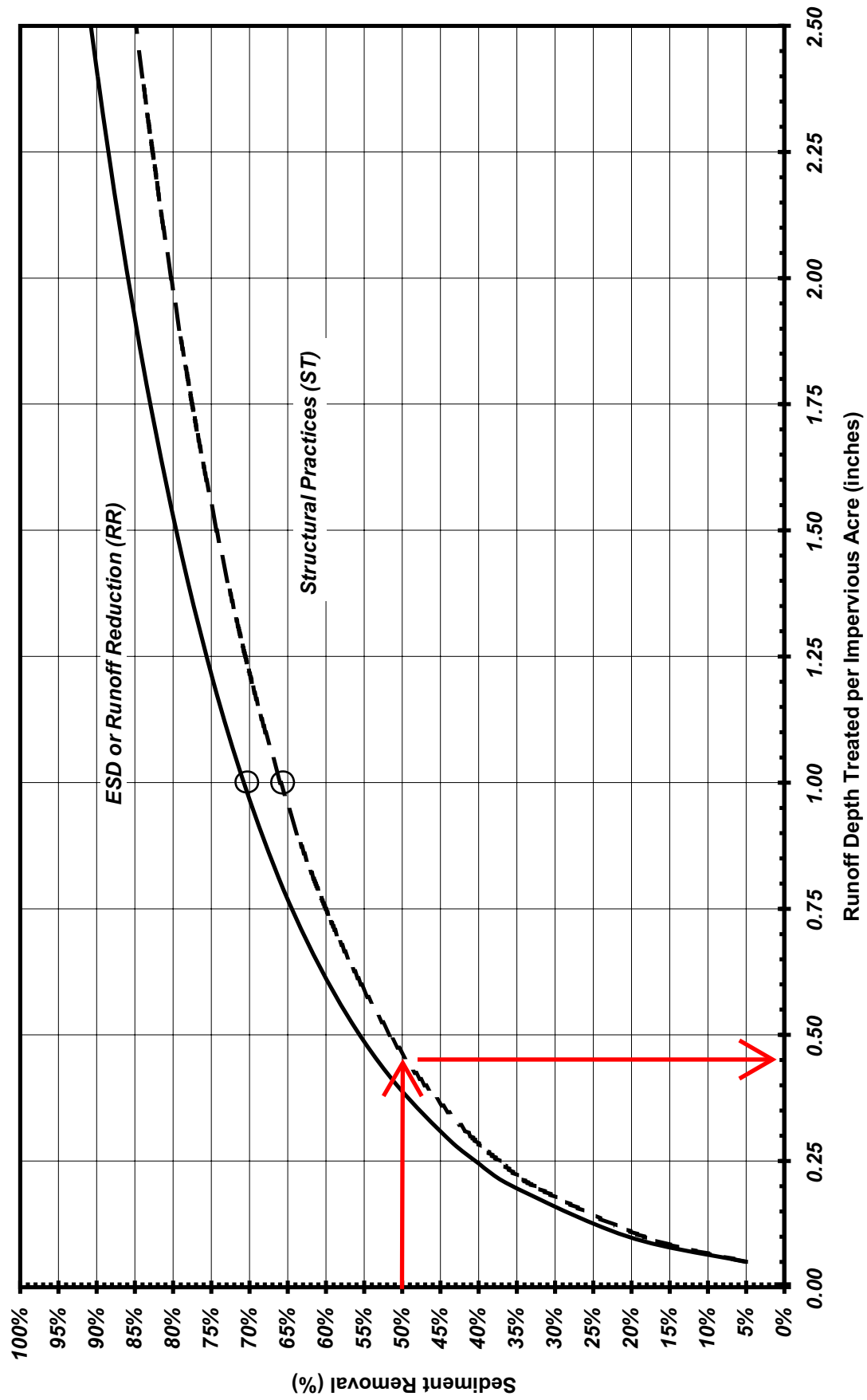
15%

10%

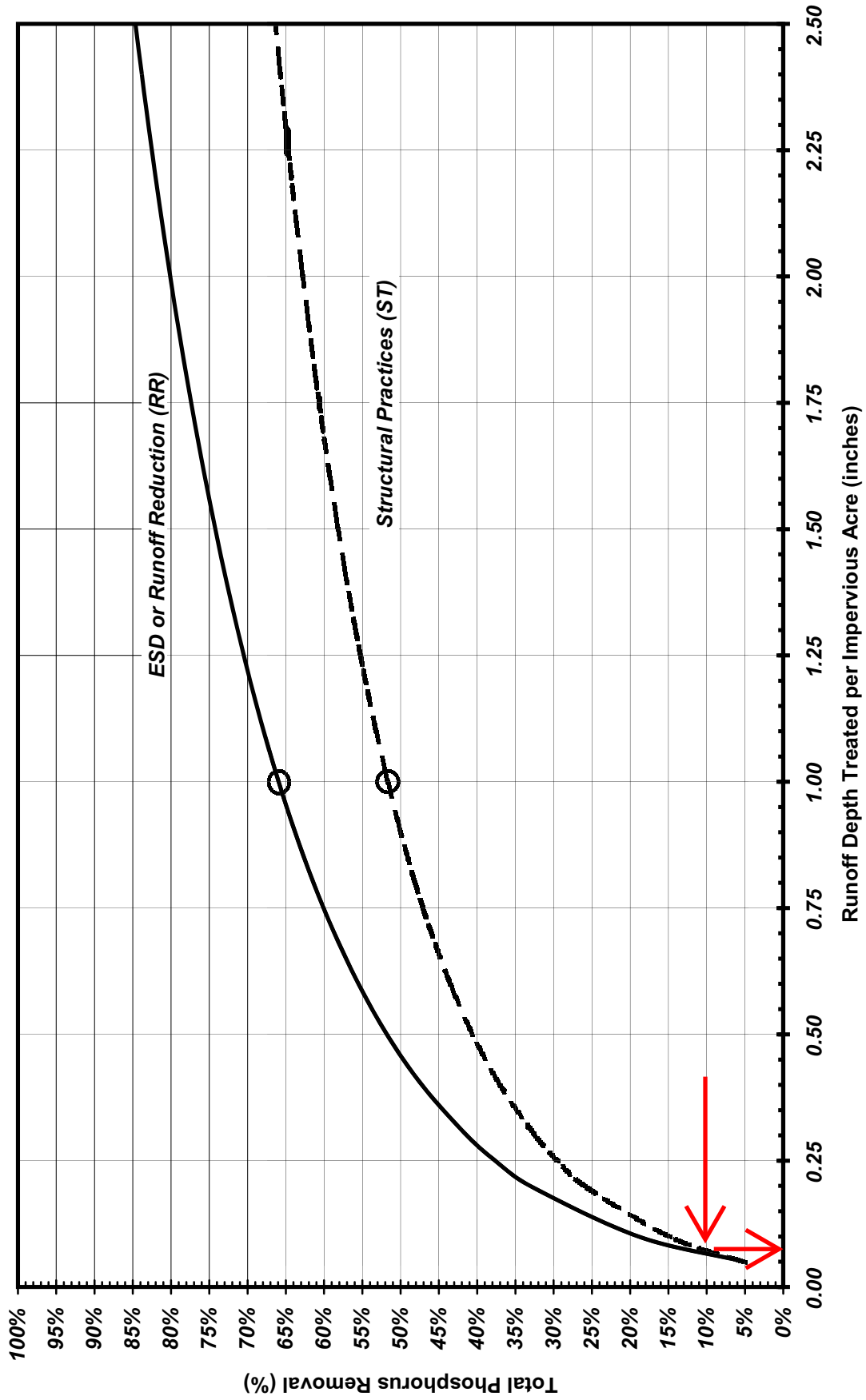
50%

Appendix A - BMP Removal Rate Adjustor Curves (Schueler and Lane, 2012)

Sediment Removal
for ESD (RR) and Structural (ST) Stormwater Practices



**Total Phosphorus Removal
for ESD (RR) and Structural (ST) Stormwater Practices**



**Total Nitrogen Removal
for ESD (RR) and Structural (ST) Stormwater Practices**

