



Date: January 20, 2012

Subject: Revisions to Cost/Benefit Study of the Impacts of Potential Nutrient Controls for Colorado Point Source Discharges

The CDM Smith Team is redistributing the Cost/Benefit Study of the Impacts of Potential Nutrient Controls for Colorado Point Source Discharges (Study) due to changes that have been made since the previous release of the Study in December 2011. The following edits have been made:

- The City of Delta (GUN_02) is included in the analysis. It was previously exempted as a disadvantaged community.
- The wastewater costs associated with the City of Aurora Sand Creek Water Reuse Facility (PLT_07b) have been edited. The previous analysis had double-counted this facility; once as a mechanical plant upgrade, and once as a lagoon that would require total replacement. The updated cost calculations include only the upgrade costs for the mechanical plant.
- The Town of Bayfield (SW_01) was previously labeled as exempt in the GIS analysis. This facility is not exempt, and although it was previously included in the wastewater costs and water quality analysis, the mapping has been updated which added additional “affected stream miles” in the benefits calculations.
- The Genesee Water and Sanitation District (PLT_01) was previously exempted as a lagoon facility in the wastewater calculations and is now included in the wastewater costs as a mechanical plant upgrade.

Manageable Unit Benefit:Cost Ratios

The changes mentioned above resulted in edits throughout the document. Most notably, the benefit:cost ratios have noteworthy changes in GUN_02 and PLT_07b and minor changes in the following Manageable Units due to small edits and the distribution of passive benefits: ARK-03; GUN_01; PLT_01; PLT_03; SW_02; GRN_01; and GRN_02.

Table 1: Manageable Unit Benefit:Cost Ratios

Manageable Unit	Manageable Unit Name	December 2011 Tier 1 Benefit:Cost	January 2012 Tier 1 Benefit:Cost	December 2011 Tier 2 Benefit:Cost	January 2012 Tier 2 Benefit:Cost	December 2011 Tier 3 Benefit:Cost	January 2012 Tier 3 Benefit:Cost
ARK_01	Upper Arkansas River	2.12 : 1	2.12 : 1	1.35 : 1	1.35 : 1	0.34 : 1	0.34 : 1
ARK_02	Fountain Creek	0.83 : 1	0.83 : 1	0.43 : 1	0.43 : 1	0.1 : 1	0.1 : 1
ARK_03	Lower Arkansas River	1.41 : 1	1.4 : 1	1.23 : 1	1.22 : 1	0.35 : 1	0.35 : 1
COL_01	Colorado River Headwaters	0.57 : 1	0.57 : 1	0.32 : 1	0.32 : 1	0.07 : 1	0.07 : 1
COL_02	Blue River	0.34 : 1	0.34 : 1	0.83 : 1	0.83 : 1	0.24 : 1	0.24 : 1
COL_03	Eagle River	0.33 : 1	0.33 : 1	0.24 : 1	0.24 : 1	0.05 : 1	0.05 : 1
COL_04	Roaring Fork	0.26 : 1	0.26 : 1	0.34 : 1	0.34 : 1	0.06 : 1	0.06 : 1
COL_05	Lower Colorado River	0.66 : 1	0.66 : 1	0.4 : 1	0.4 : 1	0.09 : 1	0.09 : 1
GUN_01	Upper Gunnison River	0.39 : 1	0.38 : 1	0.21 : 1	0.21 : 1	0.06 : 1	0.06 : 1
GUN_02	Lower Gunnison River	0.6 : 1	0.49 : 1	0.43 : 1	0.35 : 1	0.12 : 1	0.1 : 1
PLT_01	Upper South Platte River	0.74 : 1	0.72 : 1	0.39 : 1	0.38 : 1	0.14 : 1	0.14 : 1
PLT_02	Clear Creek	**	**	0:1	0:1	0.78 : 1	0.78 : 1
PLT_03	St Vrain River	0.81 : 1	0.8 : 1	0.47 : 1	0.47 : 1	0.1 : 1	0.1 : 1
PLT_04	Big Thompson River	2.97 : 1	2.97 : 1	1.88 : 1	1.88 : 1	0.31 : 1	0.31 : 1
PLT_05	North Platte River	All Facilities Exempt	All Facilities Exempt	All Facilities Exempt	All Facilities Exempt	All Facilities Exempt	All Facilities Exempt
PLT_06	Cache La Poudre River	0.09 : 1	0.09 : 1	0.07 : 1	0.07 : 1	0.03 : 1	0.03 : 1
PLT_07A	Cherry Creek	0.67 : 1	0.67 : 1	0.27 : 1	0.27 : 1	0.1 : 1	0.1 : 1
PLT_07B	Sand Creek	1.17 : 1	4.85 : 1	0.74 : 1	2.27 : 1	0.23 : 1	0.52 : 1
PLT_07C	Big Dry Creek	0.86 : 1	0.86 : 1	0.47 : 1	0.47 : 1	0.17 : 1	0.17 : 1
PLT_07D	Middle South Platte River	0.88 : 1	0.88 : 1	0.78 : 1	0.78 : 1	0.21 : 1	0.21 : 1
PLT_08	Lower South Platte River	0.56 : 1	0.56 : 1	0.74 : 1	0.73 : 1	0.2 : 1	0.2 : 1
PLT_09	Republican River	All Facilities Exempt	All Facilities Exempt	All Facilities Exempt	All Facilities Exempt	All Facilities Exempt	All Facilities Exempt
RIO_01	Rio Grande River	0.15 : 1	0.15 : 1	0.13 : 1	0.13 : 1	0.03 : 1	0.03 : 1
SW_01	San Juan and Animas Rivers	0.23 : 1	0.27 : 1	0.14 : 1	0.16 : 1	0.03 : 1	0.04 : 1
SW_02	San Miguel and Dolores Rivers	0.98 : 1	0.96 : 1	1.66 : 1	1.65 : 1	0.4 : 1	0.4 : 1
GRN_01	Yampa River	0.73 : 1	0.72 : 1	0.42 : 1	0.42 : 1	0.1 : 1	0.1 : 1
GRN_02	White River	1.17 : 1	1.16 : 1	1.04 : 1	1.03 : 1	0.12 : 1	0.12 : 1
TOTAL	STATEWIDE	0.79 : 1	0.8 : 1	0.47 : 1	0.47 : 1	0.13 : 1	0.13 : 1

**All Non-Exempt Facilities in the Clear Creek Basin (PLT_02) have provided site-specific effluent data to indicate they are discharging below Tier 1 levels in agreement with the Standley Lake Water Rights. Therefore, there were no costs and benefits associated with Tier 1.

River Basin Benefit:Cost Ratios

The aggregated results from the manageable units also led to changes in the benefit:cost ratios within each river basin. Again, the most notable changes occurred in the Gunnison and Platte River basins.

Table 2: River Basin Benefit:Cost Ratios

River Basin Name	December 2011 Tier 1 Benefit:Cost	January 2012 Tier 1 Benefit:Cost	December 2011 Tier 2 Benefit:Cost	January 2012 Tier 2 Benefit:Cost	December 2011 Tier 3 Benefit:Cost	January 2012 Tier 3 Benefit:Cost
Arkansas	1.25 : 1	1.24 : 1	0.72 : 1	0.72 : 1	0.18 : 1	0.18 : 1
Colorado	0.46 : 1	0.45 : 1	0.39 : 1	0.39 : 1	0.1 : 1	0.1 : 1
Gunnison	0.51 : 1	0.46 : 1	0.33 : 1	0.3 : 1	0.1 : 1	0.09 : 1
Platte	0.72 : 1	0.75 : 1	0.41 : 1	0.42 : 1	0.13 : 1	0.13 : 1
Rio Grande	0.15 : 1	0.15 : 1	0.13 : 1	0.13 : 1	0.03 : 1	0.03 : 1
Southwest	0.35 : 1	0.38 : 1	0.34 : 1	0.36 : 1	0.1 : 1	0.11 : 1
Yampa-White	0.78 : 1	0.77 : 1	0.47 : 1	0.46 : 1	0.11 : 1	0.11 : 1

Statewide Benefit:Cost Ratio

The aggregated results from the river basins had little effect on the statewide ratio. The Tier 1 ratio was the only result to change.

Table 3: Colorado Benefit:Cost Ratio

	December 2011 Tier 1 Benefit:Cost	January 2012 Tier 1 Benefit:Cost	December 2011 Tier 2 Benefit:Cost	January 2012 Tier 2 Benefit:Cost	December 2011 Tier 3 Benefit:Cost	January 2012 Tier 3 Benefit:Cost
STATEWIDE	0.79 : 1	0.8 : 1	0.47 : 1	0.47 : 1	0.13 : 1	0.13 : 1

Additional Analysis Completed Outside of the Original Scope of Work

Appendix I: Tier 1 Analysis for total phosphorus (TP) and total inorganic nitrogen (TIN), has been added to the document. The appendix contains the results of additional costing analyses that were completed for the Colorado Wastewater Utility Council to separate costs for wastewater treatment of TP and TIN to meet Tier 1 limits.