



Memorandum

To: Bassett Creek Watershed Management Commission
From: Barr Engineering Co.
Subject: Item 6D – Review Results of Comparative Analysis of Linear Projects: Water Quality Treatment Outcomes
Date: September 10, 2020
Project: 23270051 2020 001

Background

At their May 18, 2017 meeting, the Commission approved revisions to the BCWMC's Requirements for Improvements and Development Proposals (Requirements document) that revised the BCWMC's water quality performance standards for linear projects. The previous (2015) standards required MIDS treatment for linear projects when the project would result in 1 acre of new/fully reconstructed impervious:

MIDS standard: capture and retain the larger of 1.1 inches off the net increase in impervious – or – 0.55 inches off the new/fully reconstructed impervious (acre-feet). Follow flexible treatment options if volume reduction BMPs are not feasible or not allowed.

The revised/current (2017) standards require treatment for linear projects when the project will result in 1 acre of net new impervious:

BCWMC standard: capture & retain 1.1 inches off the net new impervious area (acre-feet). Follow flexible treatment options if volume reduction BMPs are not feasible or not allowed.

After the approved revisions, the Commission requested a periodic analysis comparing the revised linear project standards vs. the previous (MIDS) standards on linear projects reviewed by the BCWMC after the standards were revised. The Commission Engineer completed the first analysis for review by the Commission at their September 2018 meeting. This memo adds to the analysis completed in 2018.

Analysis

We compared the MIDS water quality (previous) requirements and the BCWMC water quality (current) requirements for the 25 linear projects that triggered BCWMC review, since the May 2017 Commission meeting. Table 1 shows the 25 linear projects, pertinent project data, the required water quality treatment volume under previous and current requirements, and the amount of treatment that was provided.

As shown in Table 1, one of the 25 linear projects reviewed triggered water quality treatment per the current requirements, whereas 19 of the 25 projects would have triggered water quality treatment per the previous requirements. For the 19 projects that would have triggered water quality treatment per the

previous requirements, the total required treatment volume would have been 3.87 acre-feet. However, many projects in the Bassett Creek watershed are unable to meet volume reduction requirements, often due to low infiltrating soils, and it is not known if the project proposers could have provided that treatment volume.

Since the May 2017 Commission meeting, linear projects requiring BCWMC review (25 total) have created 90.74 acres of new/fully reconstructed impervious surfaces resulting in an estimated total phosphorus (TP) loading of 162.0 pounds per year. The previous requirements would have required 60 to 100 percent TP removal, based on volume reduction capacity of the site, resulting in estimated pollutant removals of 97.2 - 162.0 pounds per year of TP. However, of the 90.74 acres of new/fully reconstructed impervious surfaces, approximately 94% (85.35 acres) was reconstructed impervious and approximately 6% (5.39 acres) was net new impervious. Therefore, based on the change in impervious only (i.e., 5.39 acres of net new impervious), the linear projects requiring BCWMC review created an additional TP loading of 9.6 pounds per year compared to pre-project conditions.

The magnitude of the reduced water quality treatment for linear projects was also evaluated by comparing the estimated TP loading from the linear projects to the total TP loading for the watershed. The BCWMC P8 model, developed and adopted in 2012, estimates TP loads of 3,200 pounds per year at the inlet to the Bassett Creek tunnel. Based on this loading, the linear projects submitted since the May 2017 Commission meeting are contributing up to 3.0% - 5.1% additional TP loading to Bassett Creek relative to the loading that would have occurred with the previous requirements in place. Based on the change in impervious only (i.e., 5.39 acres of net new impervious), the linear projects submitted since May 2017 are contributing approximately 0.3% additional TP loading to Bassett Creek, relative to pre-project conditions.

Finally, water quality benefits and TP removal may be provided by onsite or downstream treatment prior to discharging to Bassett Creek; therefore, the estimated TP loading increases should be viewed as a maximum. Also, some of the reviewed linear projects may provide some level of water quality treatment, but the data was not provided to the BCWMC because it was not required as part of the review. A more detailed analysis of the specific effects of these linear projects could be performed using the P8 model and the Commission expects cities to annually submit any new water quality improvement structures to the Commission Engineer so the P8 model can be updated appropriately.

Table 1. Comparison of previous (2015) and current BCWMC triggers and water quality performance standards for linear projects

BCWMC Reviews of Linear Projects																																		
													^ Previously reviewed by the BCWMC at their September 2018 meeting. ^																					
													2017-33	2018-02	2018-04	2018-05	2018-07	2018-08	2018-09	2018-11	2018-15	2018-18	2018-21											
													Metro Transit C Line BRT	Hwy 55 Frontage Road Reconstruction	Golden Valley 2018 PMP	Luce Line Regional Trail Reconstruction	Toledo-Scott Avenue Reconstruction	Kilmer Park Street Reconstruction	CenterPoint Energy 2018 MBLG GV West	CenterPoint Energy Boone Avenue N Mill	Trunk Highway 55 (TH 55) West Improvements	CenterPoint Energy 2018 MBLG GV Central	MCES Golden Valley Interceptor											
													2018-22	2018-30	2018-31	2019-02	2019-04	2019-05	2019-10	2019-12	2019-28	2020-01	2020-04	2020-07	2020-12	2020-13								
													Plymouth Sanitary and Storm Sewer Rehab	Winpark Drive Infrastructure Impr.	CSAH 9 (Rockford Road) and I-494 Interchange	Golden Valley 2019 PMP	CenterPoint MBLSW Winnetka Avenue	Candlelight Terrace Street Reconstruction	Ridgedale Drive Improvements	Theodore Wirth Golf Course Cart Paths	Plymouth 2020 Street Construction	Golden Valley 2020 PMP	CenterPoint Energy 2020 MBLNW Winnetka	Crystal 2020 Utility Reconstruction	New Hope 2020 Infrastructure Improvements	West Broadway Ave (CSAH81) Bridges Recon.								
BCWMC Project Review Data	Project Disturbance (acres)		5.50	1.50	8.37	1.92	3.40	7.70	1.80	0.90	2.66	1.77	4.42	0.67	3.90	19.17	11.03	2.50	1.61	14.24	7.00	20.70	7.90	4.50	4.09	14.08	7.4							
	Existing Impervious (acres)		5.40	1.15	5.27	0.76	2.89	4.58	1.80	0.00	0.92	1.77	0.86	0.00	2.64	5.91	5.89	2.50	0.95	8.94	2.35	12.81	4.56	4.50	1.95	6.08	3.64							
	Proposed Impervious (acres)		5.00	1.17	5.07	0.73	3.00	4.96	1.80	0.00	1.58	1.77	0.86	0.00	2.43	7.66	5.64	2.50	0.92	8.84	3.85	13.76	4.32	4.50	1.74	6.08	3.41							
	Change in Impervious (acres)		-0.40	0.02	-0.20	-0.03	0.11	0.38	0.00	0.00	0.66	0.00	0.00	0.00	-0.21	1.75	-0.25	0.00	-0.03	-0.10	1.50	0.95	-0.24	0.00	-0.21	0.00	-0.23							
	New Impervious (acres)		0.00	0.02	0.00	0.00	0.11	0.38	0.00	0.00	0.66	0.00	0.00	0.00	0.00	1.76	0.00	0.00	0.00	0.00	1.50	0.96	0.00	0.00	0.00	0	0							
	Reconstructed Impervious (acres)		5.00	1.15	5.07	0.73	2.89	4.58	1.80	0.00	0.92	1.77	0.86	0.00	2.43	5.91	5.64	2.50	0.92	8.84	2.35	12.81	4.32	4.50	1.74	6.08	2.56							
	Total New and Reconstructed Impervious (acres)		5.00	1.17	5.07	0.73	3.00	4.96	1.80	0.00	1.58	1.77	0.86	0.00	2.43	7.66	5.64	2.50	0.92	8.84	3.85	13.76	4.32	4.50	1.74	6.08	2.56							
Previous (2015) BCWMC Requirement:	Trigger MIDS at 1 acre of new/fully reconstructed impervious	MIDS Treatment: Capture & retain larger of 1.1 inches off the net increase in impervious – or – 0.55 inches off the new/fully reconstructed impervious (acre-feet). Follow flexible treatment options if volume reduction is not feasible or not allowed.		0.23	0.05	0.23	0	0.14	0.23	0.08	0	0.07	0.08	0	0.11	0.35	0.26	0.11	0	0.41	0 ⁶	0.63	0.2	0.21	0.08	0.28	0.12							
Current BCWMC Requirement:	Trigger treatment at 1 acre of net new impervious	Capture & retain 1.1 inches off the net new impervious area (acre-feet). Follow flexible treatment options if volume reduction is not feasible or not allowed.		0	0	0	0	0	0	0	0	0	0	0	0.16	0	0	0	0	0	0 ⁶	0	0	0	0	0	0							
Actual Treatment Provided:	Capture and Retain Volume Provided (acre-feet) ¹		0	- ²	0 ³	0	- ²	0	0	0	0	0	0	0	0	- ⁴	0	0	- ²	- ⁵	0 ⁶	0	0	0	0	0	0							

¹ Projects with site restrictions may not be required to "capture & retain" the water quality volume. These projects must follow BCWMC Flexible Treatment Options (FTOs).

² Water quality treatment provided but information and/or documentation not submitted or not reviewed.

³ No volume retained specifically as part of project, but a filtration basin proposed as mitigation for 2016 PMP project and 2017 PMP project.

⁴ Water quality treatment provided as part of FTO #2 due to the presence of high seasonal groundwater.

⁵ Water quality treatment provided as part of BCWMC Capital Improvement Program (CIP) Project CL-3 in conjunction with this project.

⁶ Trails and sidewalks and other miscellaneous disconnected impervious surfaces are exempt from BCWMC water quality performance standards.