

Pollutant Hot Spots - Priority Ranked Parcel Summary Report

Municipality: Merrimack, NH

Date of Report: November, 2021

Purpose

The NH 2017 Small MS4 General Permit requires for permittees to create an inventory and priority ranking of permittee-owned properties that could be retrofitted with Best Management Practices (BMPs) to reduce stormwater discharges and address pollutant loading from catchments identified as having high loading for nitrogen and/or phosphorus. To aid in these efforts, the information presented in this report may be used to identify and prioritize measures to reduce pollutant loading to impaired waters from the permittee's MS4 area.

This information will assist in fulfilling the following permit requirements for Year 4:

1. MCM #5 Post Construction Stormwater Management
 - a. Inventory and priority ranking of permittee-owned property and existing infrastructure that could be retrofitted with BMPs designed to reduce frequency, volume and pollutant loads of stormwater discharges (page 48, section 2.3.6.e).
2. Appendix H - Requirements Related to Water Quality Limited Waters
 - a. Nitrogen Source Identification Report (Appendix H, page 3, section I.1.b).
 - b. Phosphorus Source Identification Report (Appendix H, page 6, section II.1.b).
3. Appendix F - Lake and Pond Phosphorus TMDLs
 - a. Information in this report may be used in the development of Lake Phosphorus Control Plans (LPCP), such as developing a priority ranking of areas and infrastructure for potential implementation of phosphorus control practices.

Methods

Geographic Information System (GIS) analysis of the municipality of Merrimack, NH was performed in 2019 using publicly available GIS layers; the analysis yielded total suspended solids (TSS), total nitrogen (TN), and total phosphorus (TP) pollutant load "hot spot" data per parcel by utilizing layers for parcel boundaries, conservation areas, land use, and impervious cover (IC) coupled with the pollutant load export rates found in Table 2-1 of Appendix F of the NH MS4 permit*.

The results were sorted to identify non-conservation parcels owned by the municipality in descending order by acreage of impervious cover, which indicated the priority rank for BMP implementation on municipally owned properties. Parcels were ranked using impervious cover because it is a key metric representing the largest manageable load for pollutants commonly associated with stormwater. Because impervious cover is not evenly distributed on municipal parcels, the graph of cumulative percent of impervious cover for the resulting ranked parcels is non-linear with a typical "knee" which indicates

*<https://www.epa.gov/npdes-permits/new-hampshire-small-ms4-general-permit>

the point of decreasing IC area per additional parcel to be managed. The knee represents the optimal number of parcels to be treated by BMPs as they will treat the most impervious cover on the least number of parcels. This method also generally optimizes the resulting TSS, TN, and TP reductions, and costs for treatment as they are all linked to the IC area.

Results

Figure 1 shows the graph of cumulative percent of IC for the resulting ranked, municipal, non-conservation parcels. The knee of the curve is called out as the goal for treatment.

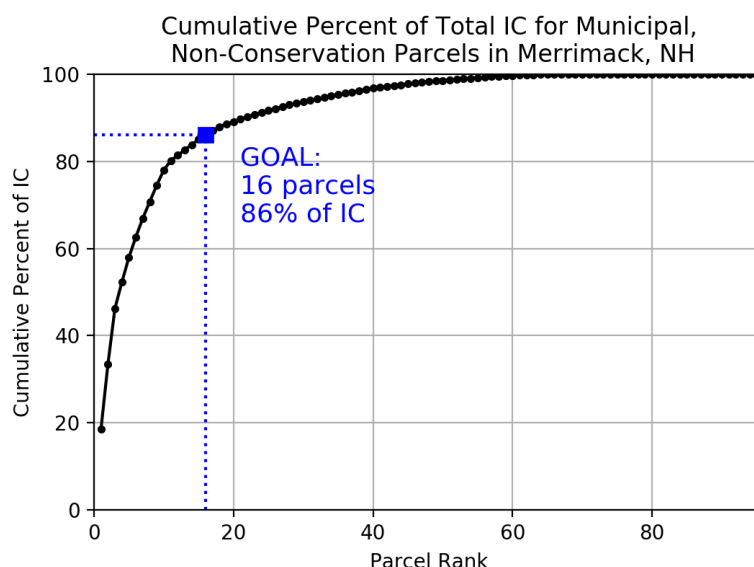


Figure 1: Cumulative percent of IC vs rank (priority) for municipal, non-conservation parcels.

Merrimack's target for treatment is 16 parcels . Treating all the IC from these top 16 parcels accounts for 86% of all the municipally owned, non-conservation properties.

Pollutant reductions were estimated using the EPA performance curves for an infiltration basin BMP class** with a physical storage capacity of 0.4 inches and infiltration rate of 1.02 in./hr.. The curve yields 96% TSS reduction, 92% TN reduction, and 81% TP reduction. Table 1 is a summary table showing the IC, TSS reduction, TN reduction, TP reduction, and total estimated costs using the EPA costs outlined in UNH performance fact sheets** for the top 16 parcels and the percentage of the top parcels to the total municipal, non-conservation properties.

Table 1: Summary of priority municipal, non-conservation parcels. The total IC, TSS, TN, and TP reductions using the stated assumed treatment, and estimated cost of treatment are summarized for the priority parcels and their percentage of total municipal, non-conservation parcels.

	IC	TSS Red.	TN Red.	TP Red.	Cost
Top 16 Parcels Total	14 ac	12,549 lb/yr	177 lb/yr	19 lb/yr	\$642,000
Percent of Municipal, Non-Cons.	86%	73%	64%	68%	86%

**https://www.unh.edu/unhsc/sites/default/files/media/ms4_permit_nomographs_sheet_final_2020.pdf

Table 2 shows the priority list of the 16 municipal, non-conservation parcels with their NH GIS ID and street address.

*Table 2: Priority municipal, non-conservation parcels ranked by descending IC with NH GIS ID and street address.****

Treatment Priority	IC (ac)	NH GIS ID	Street Address
1	3.00	06139-005C-0645-0000	80 Turkey Hill Rd
2	2.43	06139-5D-3-0126-0000	8 Baboosic Lake Rd
3	2.07	06139-003C-0040-0002	Camp Sargent Rd
4	0.98	06139-6E-1-0010-0001	Depot St
5	0.92	06139-5D-3-0003-0000	29 Baboosic Lake Rd
6	0.76	06139-5D-4-0006-0000	432 Dw Highway
7	0.70	06139-5D-4-0074-0000	441 Dw Highway
8	0.62	06139-005B-0088-0000	172 Baboosic Lake Rd
9	0.61	06139-002E-0005-0000	Mast Rd
10	0.56	06139-6E-2-0021-0000	643 Dw Highway
11	0.35	06139-002B-0314-0000	196 Naticook Rd
12	0.20	06139-004C-0255-0000	3 Atherton Rd
13	0.20	06139-005C-0671-0000	49 Turkey Hill Rd
14	0.20	06139-4D-4-0061-0000	303 Dw Highway
15	0.19	06139-005C-0098-0000	Valleyview Dr
16	0.17	06139-6D-1-0074-0001	31 Elm St

***For the complete prioritized spreadsheet including loads, reductions, and estimated costs, see:
https://www4.des.state.nh.us/nh-ms4/?page_id=1798