# Using the New England Retrofit Manual to Support SCM Selection and Design for MS4 Compliance

*Presented by*
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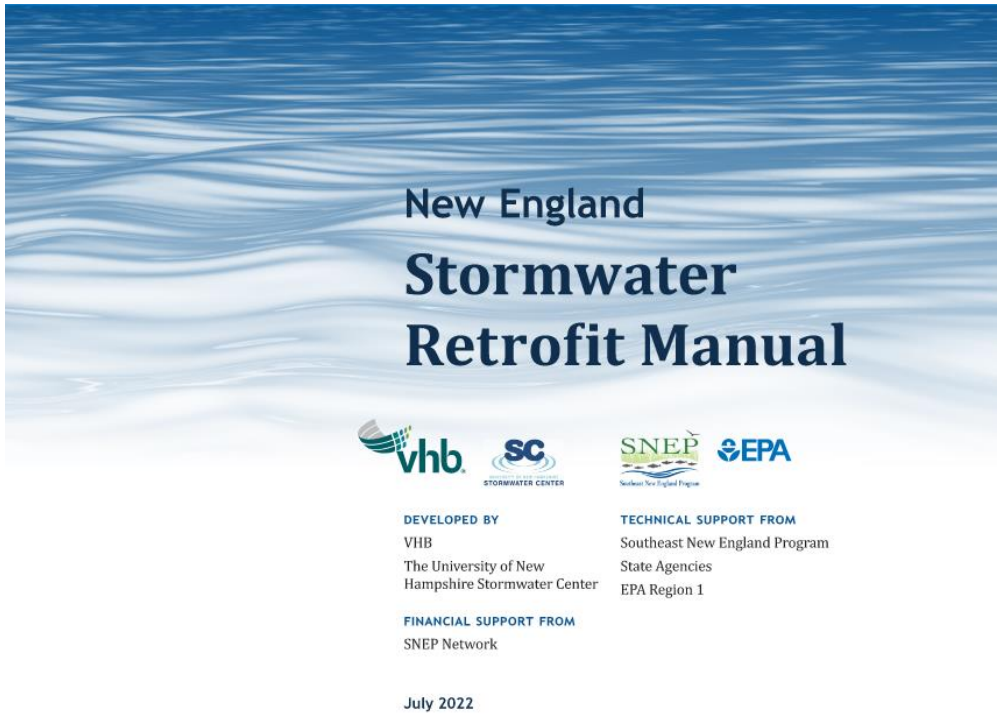
# Agenda

- New England Retrofit Manual Overview
- EPA Performance Curves
- DCR's application of the manual's guidance
  - MS4 - TMDL requirements
  - Horgan Skating Rink
  - Retrofit Design Approach

# New England Stormwater Retrofit Manual

- Focused on retrofit stormwater control measures (SCMs)
  - Not subject to regulatory requirements
- Selection of the optimal stormwater control measures (SCMs) for a specific site
- Credit pollutant and runoff volume reductions using the EPA Performance Curves




**Retrofit:** the addition of stormwater controls on a currently developed site

**SCM:** Stormwater Control Measure

[Stormwater Retrofit Manual (snepnetwork.org)]

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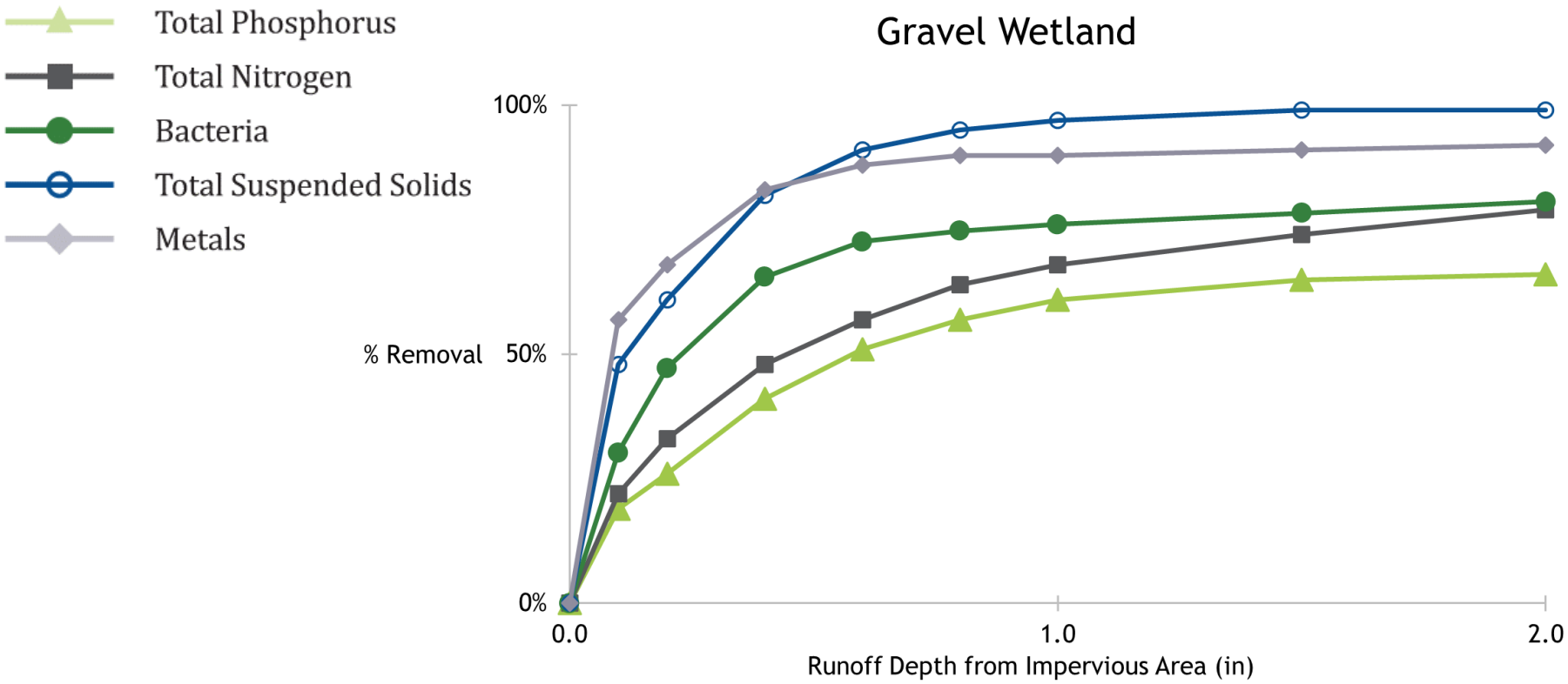
# Goals of New England Stormwater Retrofit Manual

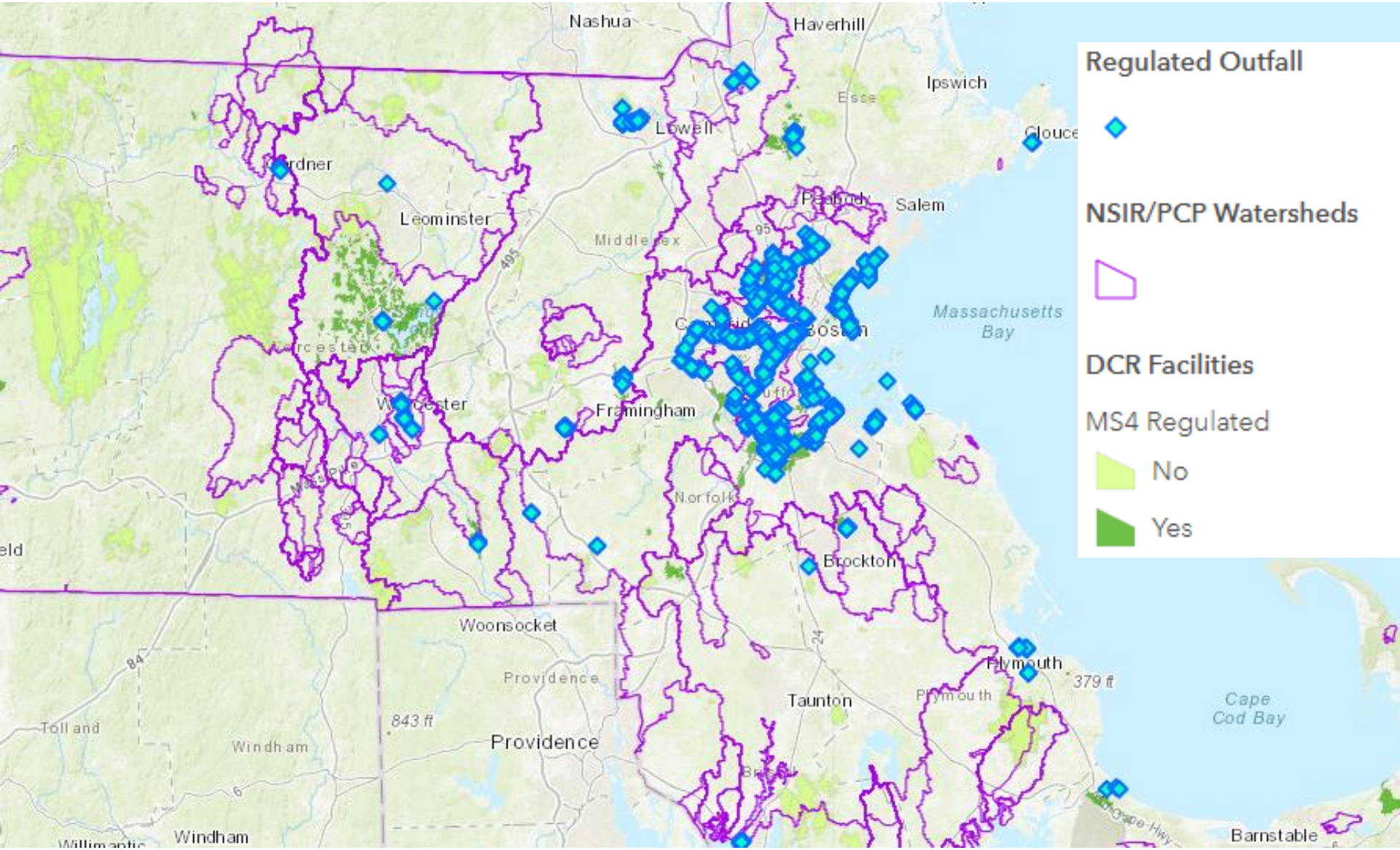
- Improve water quality by retrofit SCMs
- Small treatment is better than no treatment
  - Emphasize SCM Performance curves
- Flexibility for SCMs in constrained sites

# EPA Performance Curves



# Using the Manual to Design SCMs and Support MS4 Compliance: DCR Site Example

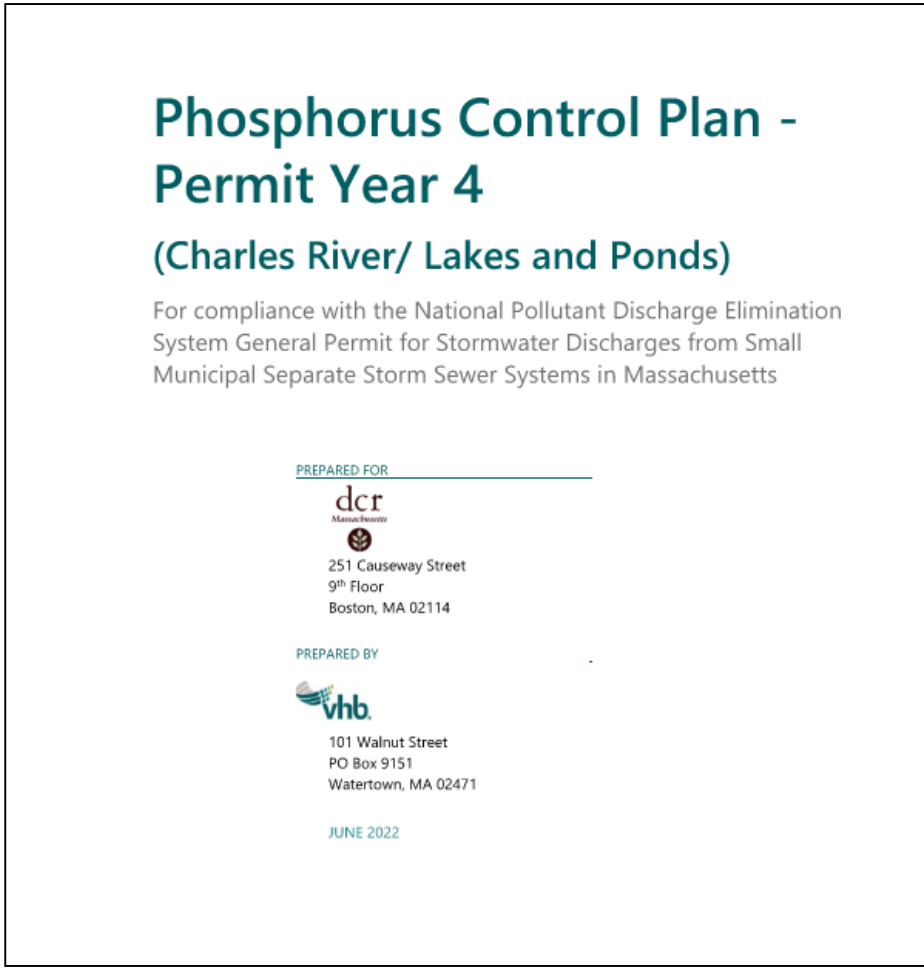
# DCR MS4 Regulated Areas



# MS4 Regulations & Phosphorus Control Plans

- Appendix F, Section A.II Lake and Pond Phosphorus TMDL Requirements
  - Calculate pollutant loading from DCR facilities
  - Develop Plan to implement SCMs to reduce pollutant load

| Watershed | Required TP Percent Reduction | Required TP Reduction |
|---|---|---|
| Auburn Pond | 24% | 0.9 lb/yr |
| **Leesville Pond** | **31%** | **1.2 lb/yr** |



Phosphorus Control Plan - Permit Year 4

(Charles River/ Lakes and Ponds)

For compliance with the National Pollutant Discharge Elimination System General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems in Massachusetts

PREPARED FOR

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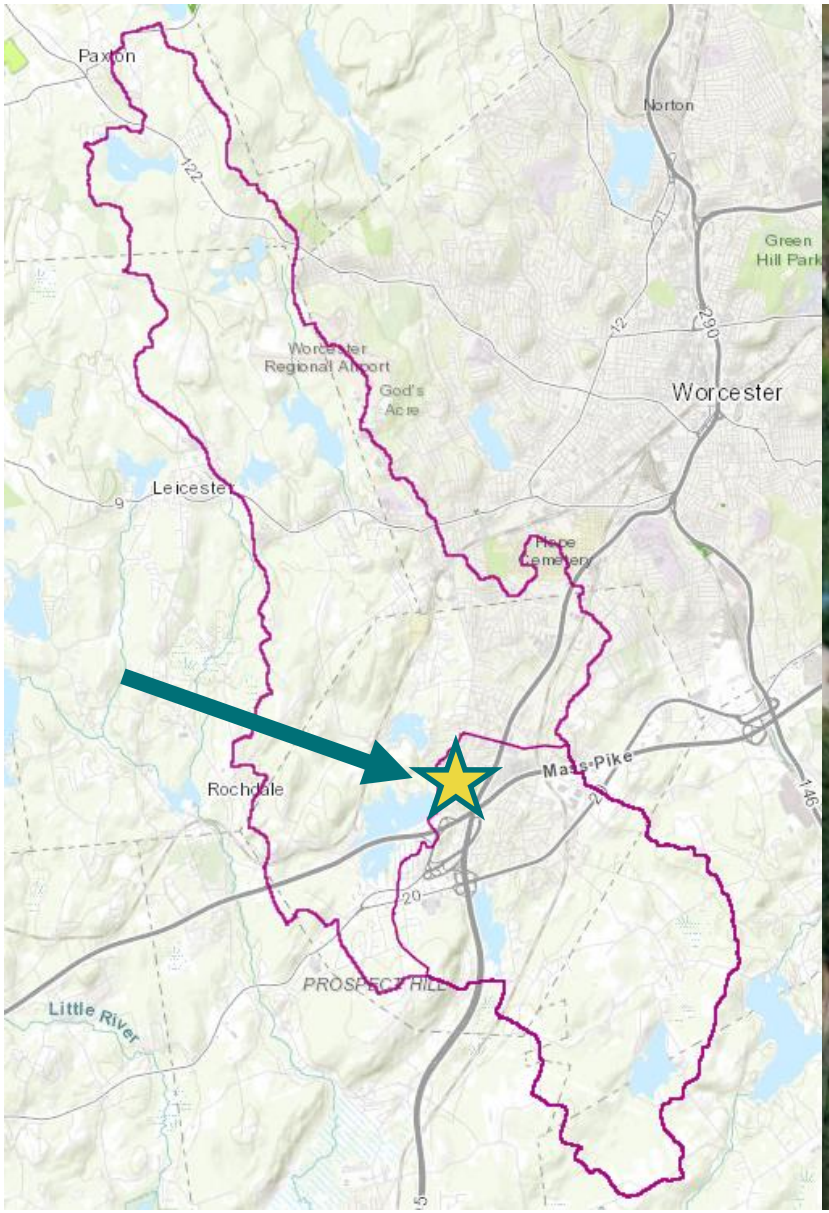
JUNE 2022

# DCR: Horgan Skating Arena




# Retrofit Manual: *Planned Approach*

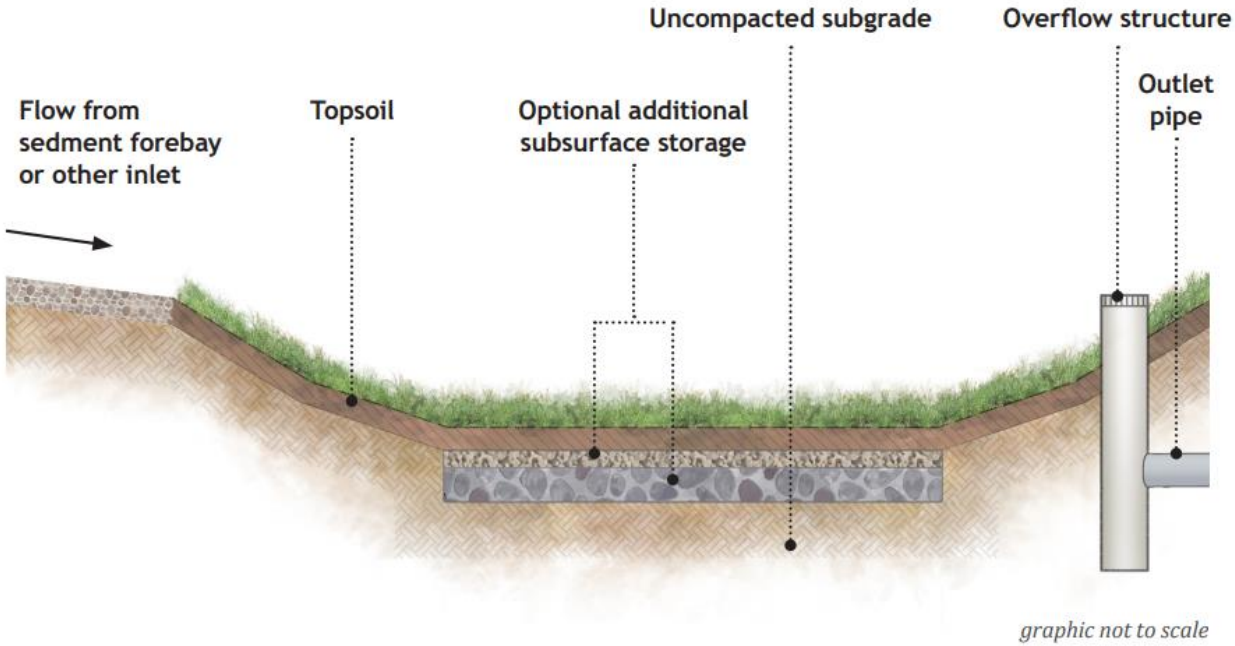
- ✓Design retrofit SCMs to met PCP required Phosphorus reduction
- ✓Not subject to new/ redevelopment regulations
- ✓Not subject to Wetland Protection Act (WPA)

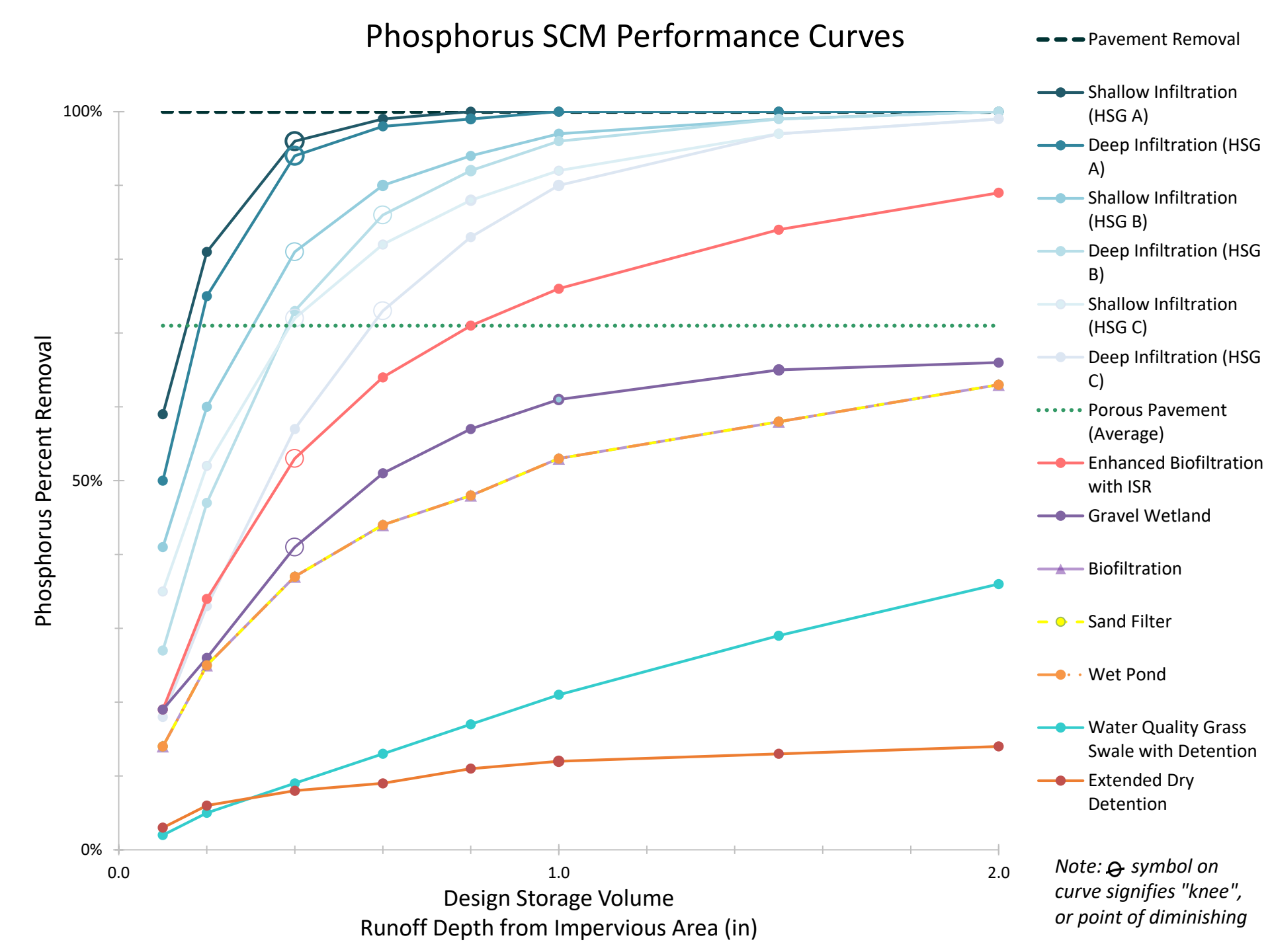
# SCM Design Alternatives

***Goal:*** *provide a 31% reduction in Total Phosphorous*

SCM Alternatives Considered:

- Impervious Cover (IC) Disconnection
  - Ruled out due to local bylaws and presence of sport fields
- Porous pavement
- Infiltration basin
- Leaching basins
- Infiltration basin and leaching basin combination

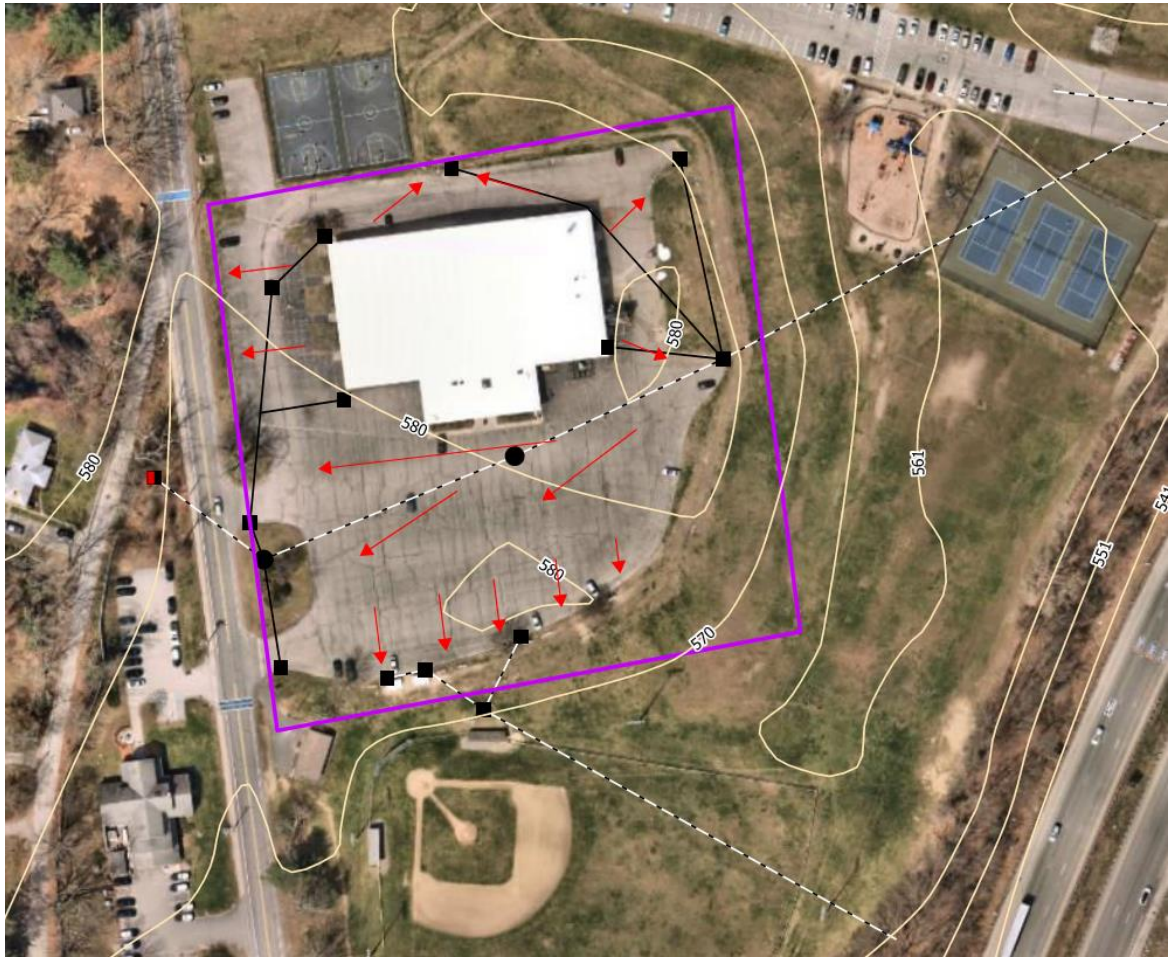



Phosphorus SCM Performance Curves
Phosphorus Percent Removal
100%
50%
0%
0.0
1.0
2.0
Design Storage Volume
Runoff Depth from Impervious Area (in)
Pavement Removal
Shallow Infiltration (HSG A)
Deep Infiltration (HSG A)
Shallow Infiltration (HSG B)
Deep Infiltration (HSG B)
Shallow Infiltration (HSG C)
Deep Infiltration (HSG C)
Porous Pavement (Average)
Enhanced Biofiltration with ISR
Gravel Wetland
Biofiltration
Sand Filter
Wet Pond
Water Quality Grass Swale with Detention
Extended Dry Detention
Note: ⊖ symbol on curve signifies "knee", or point of diminishing

# Constraints and Considerations

***Get water quality credit from the space we have!***

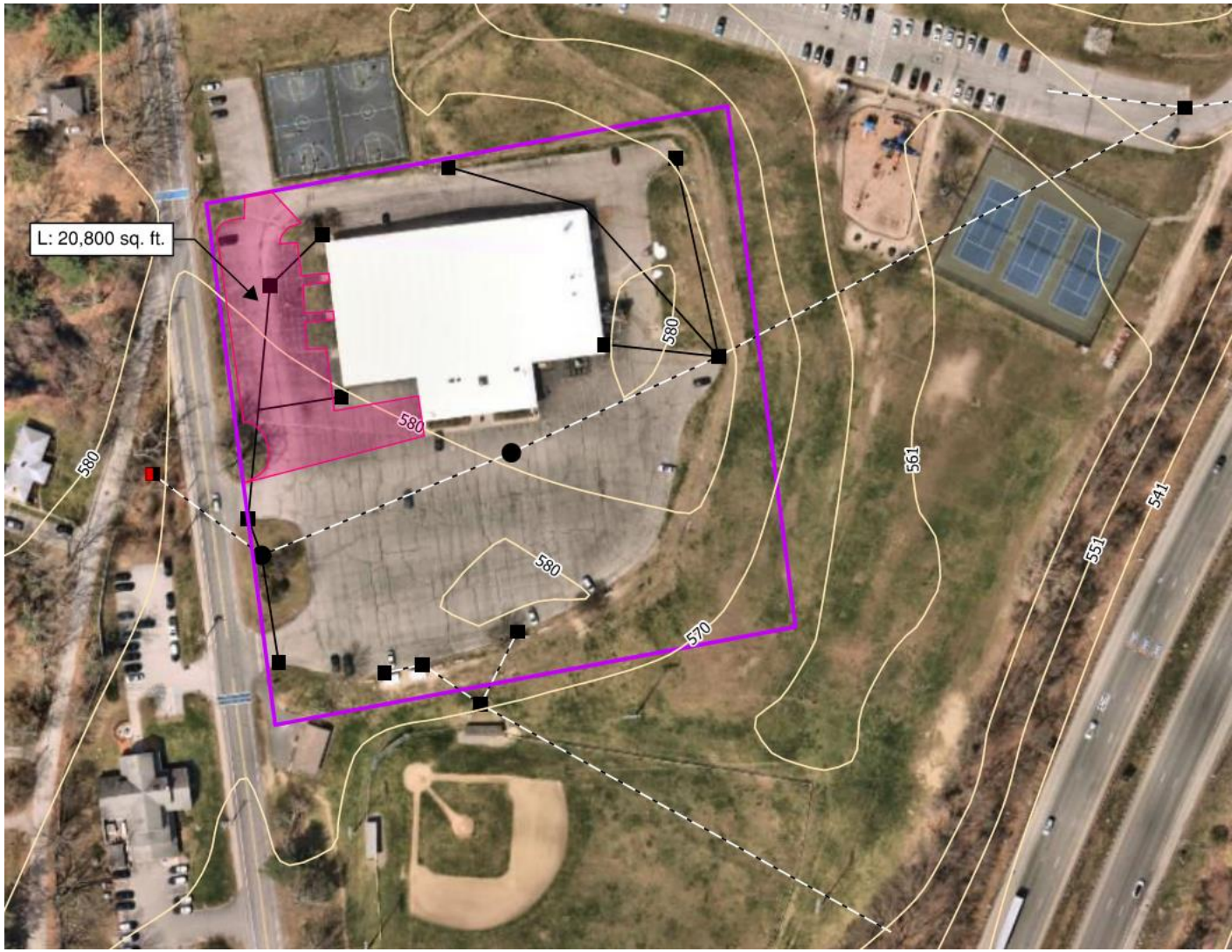
- Not planning to redo pavement
- Surrounded by town-owned sports fields
  - Steep slopes down to fields
- Utilities near the roadway
- Maintenance efforts
  - DCR typical SCM maintenance



# Porous Pavement

- 13% TP reduction
- 0.8 lb/yr TP reduction

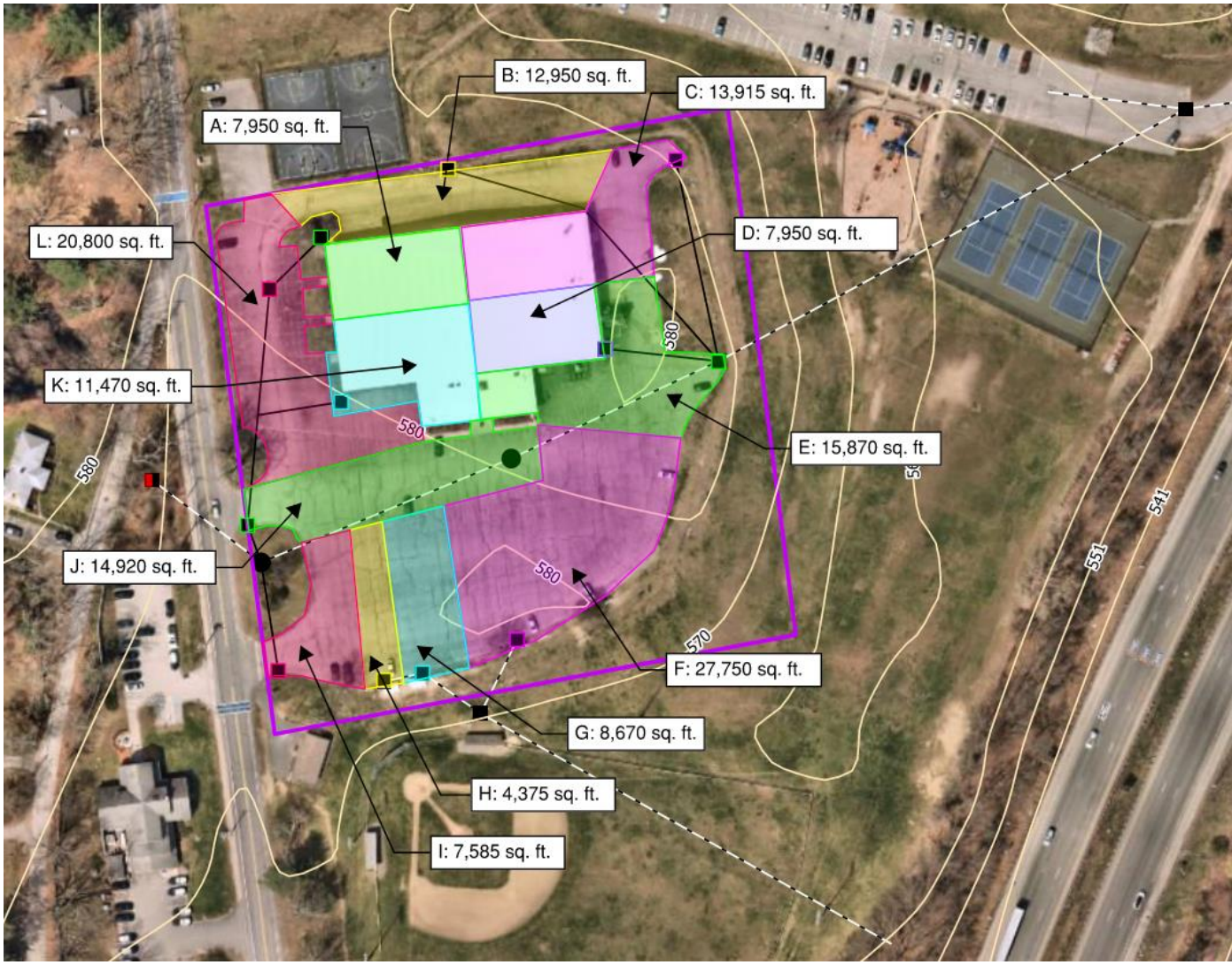
- Cannot sand on porous pavement
- Requires pressure washing
- Doesn't meet target but could make the area larger to meet



# Leaching CBs

- 18% TP Reduction
- 1.1 lb/yr TP Reduction

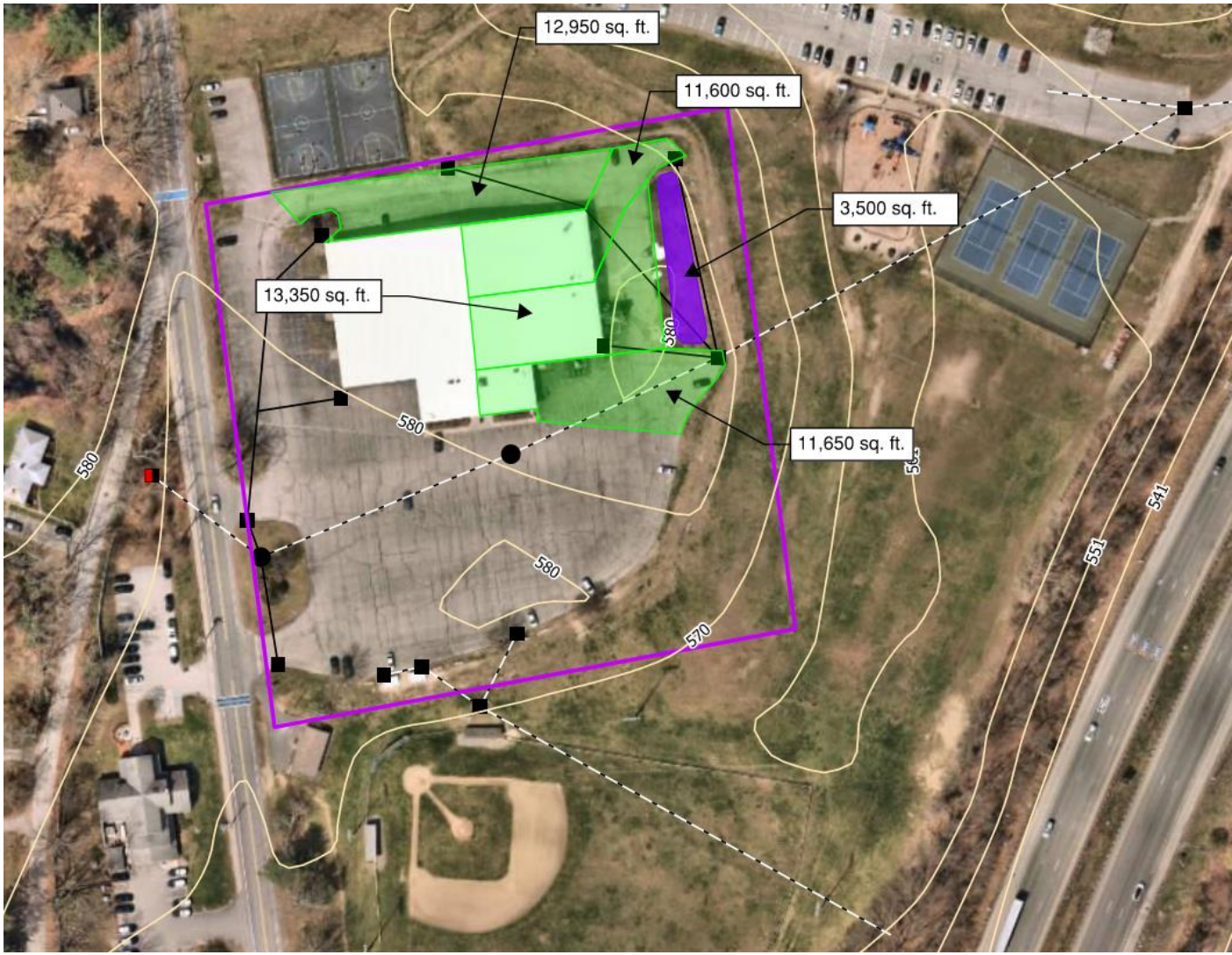
- Doesn't meet the reduction target



# Infiltration Basin

- 26% TP Reduction
- 1.6 lb/yr TP Reduction

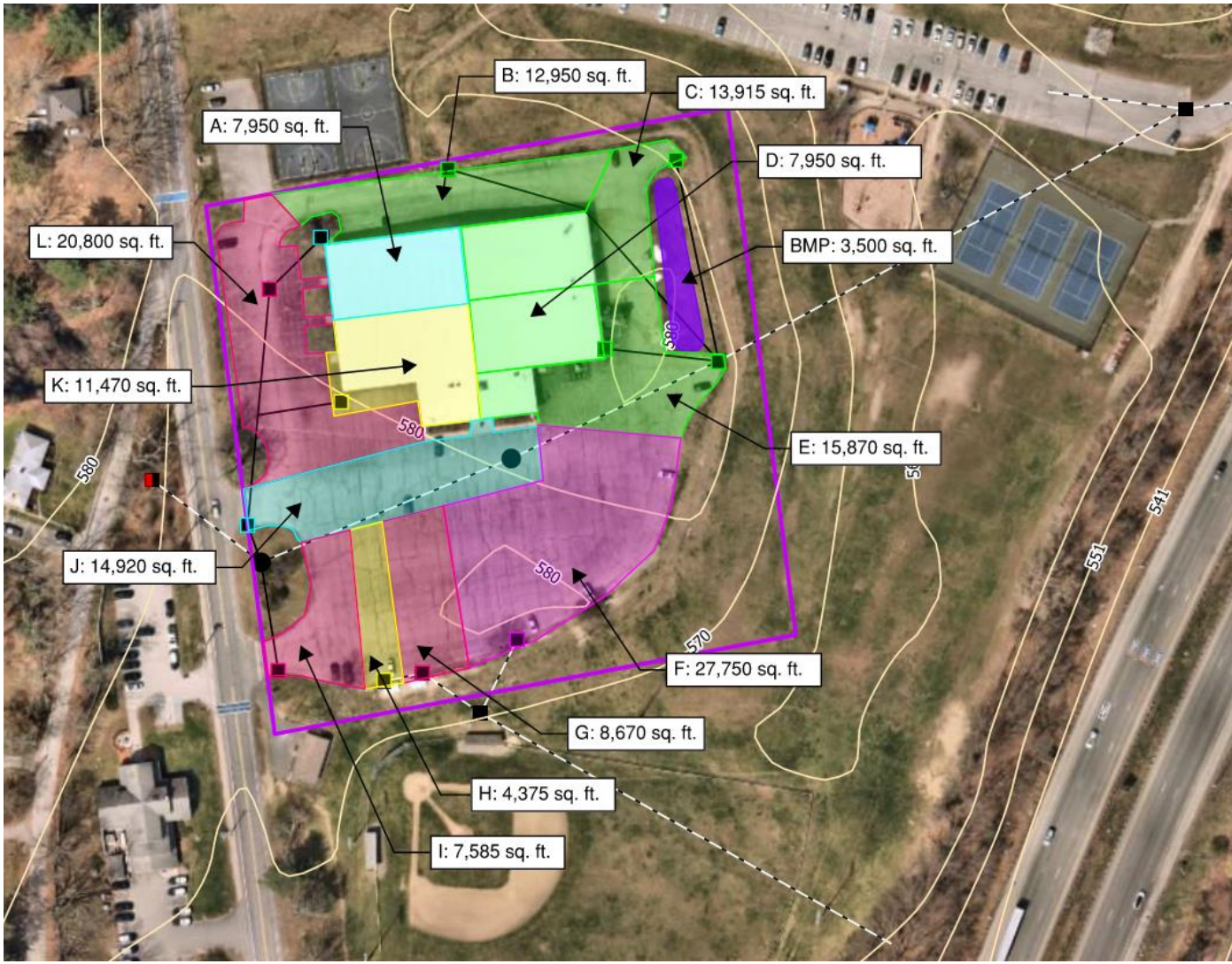
- Meets target, only treats portion of facility



# Infiltration Basin + Leaching CBs

- 38% TP Reduction
- 2.4 lb/yr TP Reduction

- Exceeds target and treats almost all of facility



# Requirements and Treatment Summary

| Watershed | Required TP Percent Reduction | Required TP Reduction |
|---|---|---|
| Auburn Pond | 24% | 0.9 lb/yr |
| **Leeseville Pond** | **31%** | **1.2 lb/yr** |

| Alternative | Total TP Removal (lb/yr) |
|---|---|
| Infiltration Basin + Leaching Basins | **2.4** |
| Infiltration Basin Only | **1.6** |
| Porous Pavement Only* | 0.8 |
| Leaching Basins Only | 1.1 |

*Cannot sand porous pavement, only represents portion of the parking lot

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# SCM Summary and Next Steps

- Treating the full site with leaching basins and an infiltration basin
- Take conceptual SCM design to full design
  - Survey to confirm to utilities and grades work
  - Refine basin volume and pollutant crediting
- Build the SCMs
- Focus on other PCP watershed retrofits

# Questions?

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