Utility Board NPDES Annual Report

April 13, 2021

National Pollutant Discharge Elimination System (NPDES)

- Staff introductions
- Outline:
  - What is NPDES?
  - What does NPDES require of us?
  - What does it look like from an O&M perspective?
  - Are there CIP projects related to NPDES?
  - How do we mitigate impacts from private development?
  - Wrap up
- Questions/Discussion

What is NPDES?

Brian Hartvigson, Right of Way and Stormwater Manager

- National Pollutant Discharge Elimination System
- Western WA Phase II Municipal Stormwater Permit

Where Does the Pollution Come From?

- Point vs. Non-Point Source Pollution
- Sources:
  - Residential
  - Commercial
  - Construction

What Does it Require of Us?

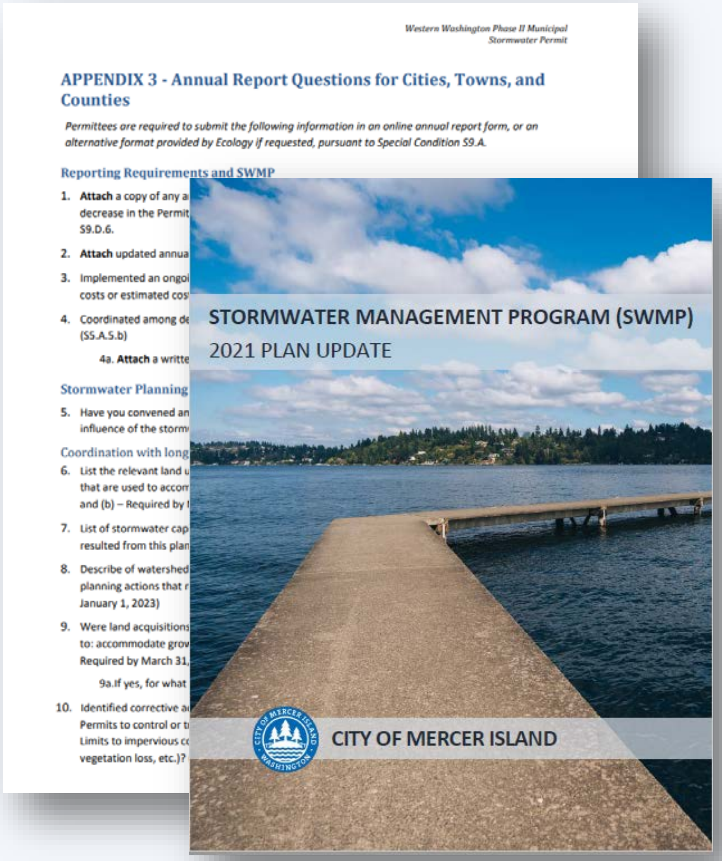
Hannah Van Pelt, Stormwater Technician

Permit Components:

1. Stormwater Planning
2. Public Education and Outreach
3. Public Involvement and Participation
4. MS4 Mapping and Documentation
5. Illicit Discharge Detection and Elimination
6. Controlling Runoff from New Development, Redevelopment, and Construction Sites
7. Municipal Operations and Maintenance
8. Source Control Program for Exiting Development

What Does it Require of Us?

- Annual Report
- Stormwater Management Program (SWMP) Plan Update
- On the horizon:
  - Watershed Inventory (2022)
    Stormwater Management Action Plan (2023)
  - Behavior Change Campaign (2021-2024)
  - Source Control Program City (2023)
  - Update facility Stormwater Pollution Prevention Plans (2022)



mercerisland.gov/stormwater

What Are We Working With?

- >5,400 catch basins
  - 2 year inspection cycle
- Approx. 300,000 ft storm drain lines
  - 6 year jet & CCTV goal
- 339 lake outfalls
  - 12% minimum inspected per year

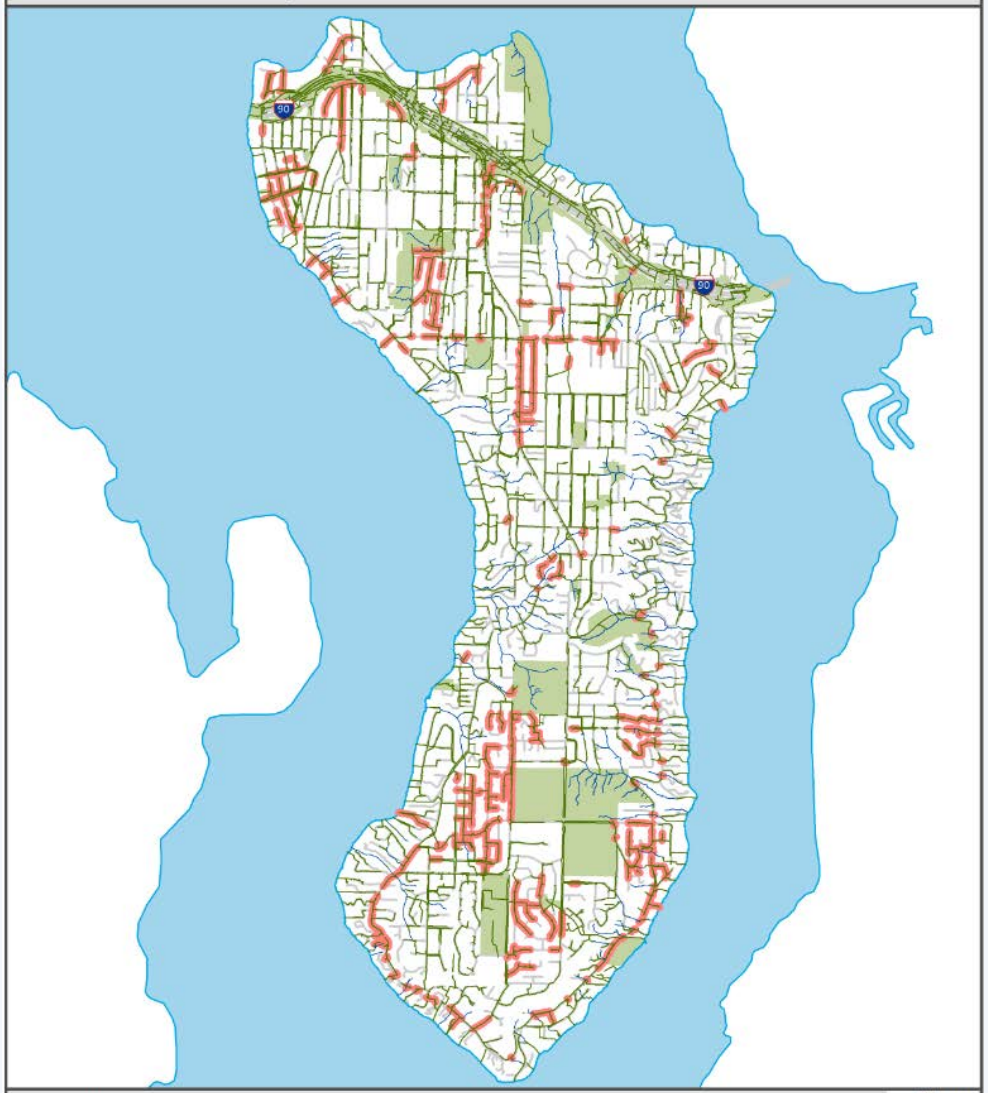
- Stormwater facilities
  - 4 heavy equipment maintenance/ storage yards
  - 25+ stormwater treatment or flow-control facilities/BMPs

Operations & Maintenance Perspective

Chris Kelley, Stormwater Lead

- Repair/Replace
  - 6 month window to complete
- Vactor, Jet, CCTV
  - 30% reduction in vactor costs using targeted approach with inspection data
- Vegetation Control
  - Open ditch conveyance
- Street cleaning/sweeping
- Storm event response
- Steep slope stabilization and erosion control
- Illicit Discharge Detection & Elimination
  - Responded to 19 reports in 2020

City of Mercer Island
Storm System Video Locations (2015-2021)



Operations & Maintenance Staffing

- Field Staff
  - Stormwater Lead
  - Right-of-Way Staff (assist when available)
  - Supplemental contract services & equipment
- Permit Compliance & Reporting
  - Stormwater Technician (part-time)

Related CIP Projects

Fred Gu, Capital Project Manager

- Runoff from urban drainage system discharges into natural watercourses

High flow event
⇩
High water energy
⇩
Cuts into streambeds & banks
⇩
Increases sediment erosion

- Sediment as pollution
  - suffocates fish eggs and buries gravel nests
  - particles absorb heat from the sun and increase water temperature & lower oxygen levels
- Watercourse stabilization projects reduce erosion-based sediment deposition from watercourses into Lake Washington

CIP Project Examples

BEFORE

AFTER

BEFORE

AFTER

Not your typical PW projects

- Watercourses are protected critical areas hence the use of natural materials (stream boulders and logs).
- Invasive removal and replanting native plants within project limits.
- Difficult access, long permitting time.
- Fewer experienced contractors.
- Added benefits of these projects: protect other infrastructures like roadways and underground utilities.

Mitigating Impacts From Private Development

Ruji Ding, Senior Development Engineer

- The NPDES permit establishes requirements to mitigate stormwater from private development
- Adopted into City Code (MICC 15.09)
- New impervious surfaces (driveways, roofs, etc) create stormwater runoff and requires mitigation.

Mitigation - Detention

Stormwater Detention:

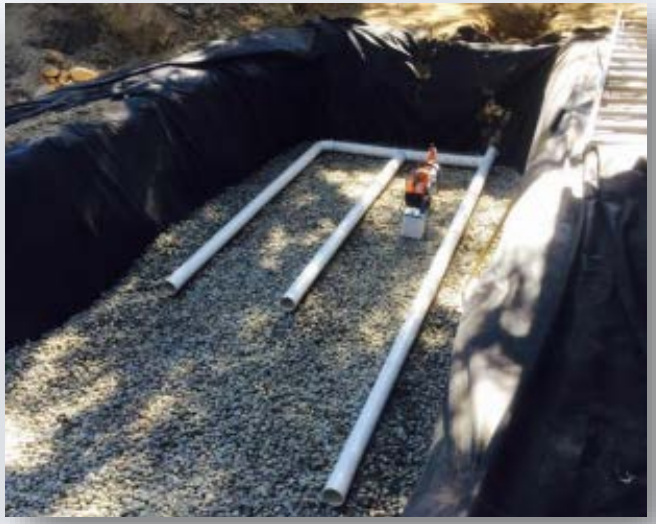
- Typically a large pipe (36”-60” diameter)
- Temporarily stores water from rainfall
- Allows water to drain out slowly over time
- Reduces high flows and erosion potential in streams
- Over 60% of Mercer Island new/major remodel homes have detention systems

Detention pipe for 6 lot subdivision

Mitigation - LID

Low Impact Development (LID):

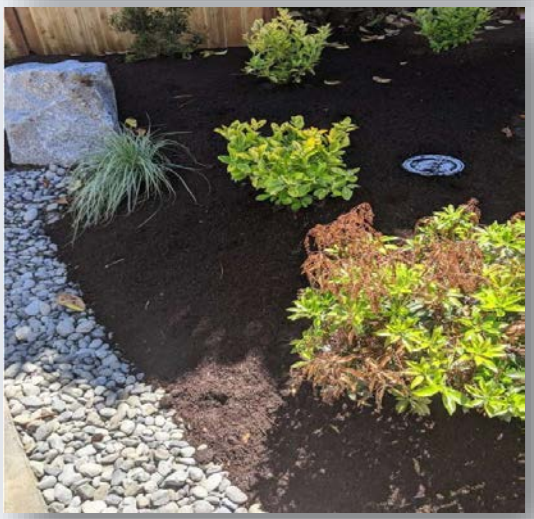
- Keeps stormwater on site
- Uses natural processes (infiltration, evaporation, rain garden)
- Only works in sandy soils (not clay)
- 90% of Mercer Island lots do not have suitable soils



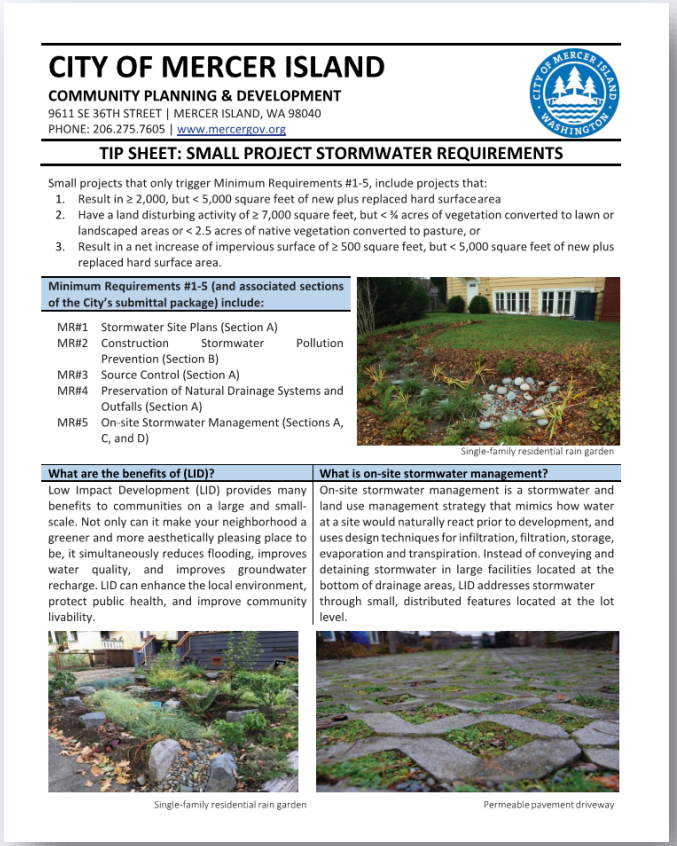
Mitigation - Soil

Post-Construction Soil Management:

- Provides deep and healthy soil for planting and lawn areas
- Reduces need for irrigation, fertilizers, and pesticides
- Keeps rainfall on site
- Improves plant health
- Aesthetically pleasing
- Required for all new homes and major remodels



Customer Resources



CITY OF MERCER ISLAND

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TIP SHEET: SMALL PROJECT STORMWATER REQUIREMENTS

Small projects that only trigger Minimum Requirements #1-5, include projects that:

1. Result in ≥ 2,000, but < 5,000 square feet of new plus replaced hard surface area
2. Have a land disturbing activity of ≥ 7,000 square feet, but < ¾ acres of vegetation converted to lawn or landscaped areas or < 2.5 acres of native vegetation converted to pasture, or
3. Result in a net increase of impervious surface of ≥ 500 square feet, but < 5,000 square feet of new plus replaced hard surface area.

Minimum Requirements #1-5 (and associated sections of the City's submittal package) include:

MR#1 Stormwater Site Plans (Section A)
MR#2 Construction Stormwater Pollution Prevention (Section B)
MR#3 Source Control (Section A)
MR#4 Preservation of Natural Drainage Systems and Outfalls (Section A)
MR#5 On-site Stormwater Management (Sections A, C, and D)

Single-family residential rain garden

What are the benefits of (LID)?

Low Impact Development (LID) provides many benefits to communities on a large and small-scale. Not only can it make your neighborhood a greener and more aesthetically pleasing place to be, it simultaneously reduces flooding, improves water quality, and improves groundwater recharge. LID can enhance the local environment, protect public health, and improve community livability.

What is on-site stormwater management?

On-site stormwater management is a stormwater and land use management strategy that mimics how water at a site would naturally react prior to development, and uses design techniques for infiltration, filtration, storage, evaporation and transpiration. Instead of conveying and detaining stormwater in large facilities located at the bottom of drainage areas, LID addresses stormwater through small, distributed features located at the lot level.

Single-family residential rain garden

Permeable pavement driveway

- City website provides tip sheets, handouts, requirements
- Customizable maps on website
  - Utilities
  - Topography
  - Aerial images
  - Many more features

Questions & Discussion