Washington State Municipal Stormwater Conference

Vijaya Tummala, P.E.

Maintenance Tracking and Asset Management
Maintenance Tracking and Asset Management

My experience with Large NPDES MS4s

- Maryland State Highways Administration
- State of Hawaii, Highways Division
Maryland State Highways Administration (MDSHA) NPDES MS4
MDSHA NPDES Permitted Areas

NPDES Jurisdictions

Legend
- SHA Routes
- NPDES Phases
  I
  II
  Non-NPDES

Map Created By: M. Speer 1/13/2014
MDSHA Stormwater Management

- Approx. 2000 SWM facilities
MDSHA NPDES MS4 BMP Inspections

Enterprise GIS system
<table>
<thead>
<tr>
<th>SHA rating</th>
<th>Action/response</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>No maintenance</td>
</tr>
<tr>
<td>II</td>
<td>Minor or routine maintenance</td>
</tr>
<tr>
<td>III</td>
<td>Major maintenance</td>
</tr>
<tr>
<td>IV</td>
<td>Retrofit / Functional Enhancement</td>
</tr>
<tr>
<td>V</td>
<td>Immediate Response</td>
</tr>
<tr>
<td>VI</td>
<td>Abandon</td>
</tr>
</tbody>
</table>
### MDSHA Maintenance & Costs

**Minor maintenance**  
$200 - $25,000*

<table>
<thead>
<tr>
<th>Maintenance Action List</th>
<th>Action</th>
<th>Date</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clean trash/debris</td>
<td>-</td>
<td>Aesthetics</td>
<td></td>
</tr>
</tbody>
</table>

Performed by:

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**Major maintenance**  
$1,000 - $75,000*

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BMP ID # 2226  
Inspection Report

BMP Type: retention pond (wet)  
Road: I97  
County Code: 2  
Contact: AA-890-500-072  
Location: NORTH OF I76  
40C Code: 72511066  
Inspection Date: 11/22/2001  
Inspection Rating: 9  
SHA Rating: II  
Drainage Area: 1,627  
Surface Area: 3,531.632  
Principal Spillway Type: RR

**Inspection Report**

- **Co-rectifications:** 1  
- **C/R integrity:** 1  
- **Aesthetics:** 1  
- **Public Hazard:** 1  
- **Forehead/Fence:** 1  
- **Access:** 1  
- **Drainage:** 1  
- **Drainage:** 1  
- **Irregularities:** 1  
- **Vegetation:** 1  
- **Combination:** 1  
- **Ditch:** 1  
- **DS Embankment Toe:** 1  
- **DS Embankment Cover:** 1  
- **DS Embankment Erosion:** 1  
- **DS Embankment Seep:** 1  

**SWM Facility Table**

- **Observation Well:** N  
- **Observation Well Depth:**  

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**Inspection Report**

- **Observation Well:** N  
- **Observation Well:**  

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**BMP Facility Table**

- **Observation Well:** N  
- **Observation Well:**  

---

**Map**

- **Observation Well:** N  
- **Observation Well:**  

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**Maintenance Action List**

- **Action:** Clean trash/debris  
- **Comments:** - Aesthetics  

Performed by:
MDSHA SWM Facilities Retrofits

Retrofit of a failed infiltration basin into a sand filter
MDSHA Lessons Learned

• SWM facilities
  - Design considerations - maintenance access, pre-treatment
  - Infiltration trenches needed periodic inspections and media replacement about every 5 years
  - Use of construction inspector to oversee maintenance contractors
MDSHA - Where are they now?

• Chesapeake Bay and other TMDLs
  ➢ Watershed based approach

• MDSHA Bay WIP II
  ➢ Milestones of annual goals for impervious areas treated from BMPs such as SWM facilities (new and retrofits), stream restoration, urban tree planting etc. until 2025
  ➢ Quantifying load reductions from various BMPs
  ➢ Tracking and verification using geodatabase
Maintenance Tracking and Asset Management

State of Hawaii Highways Division (HDOT-Highways) NPDES MS4
HDOT Highways Permitted Areas
• Integration with IBM Maximo interface to enable better tracking
   Inspection forms with IBM Maximo
   Enables compliance based tracking
   Dashboard for PMs to review compliance, work orders etc.

• ESRI GIS Centric Geodatabase
   Inventory using GPS and as-built digitization
   GUI for tracking inspections and cleaning

HDOT Highways AMS
HDOT Highways MS4 Inspections & Cleaning

- Inspect/clean approximately 10,000 drains on a semiannual and annual basis (high and low priority)
HDOT Highways MS4 Inspections & Cleaning

- Inspect 1500 outfalls on a semiannual and annual basis, clean as needed
HDOT Highways
MS4 Inspections and Cleaning

- 8,000 pipes and culverts (150 miles) - annual cleaning
- 600 open channel (26 miles) inspections on a semiannual and annual basis, clean as needed
HDOT Highways MS4 Inspections

Street sweep State routes (320 miles) on a 5 and 15-week basis
HDOT Highways MS4 Inspections

- Inspect/clean 12 permanent post-construction BMPs
  - CDS units
  - Bioretention facilities
  - Skimmer Box
HDOT Highways Maintenance Costs

![Bar chart showing maintenance costs from 2008 to 2014](chart.png)
HDOT Highways Lessons Learned

- Contracts for drain cleaning and street sweeping
  - Use of construction inspector to oversee maintenance contractors
  - Access, erosion and ROW issues with outfall cleaning
  - Pipe cleaning in conjunction with CCTV inspections

- Post-construction BMPs aka SWM facilities O&M
  - Design considerations - maintenance access
  - Need contractors with variable skills
New Permit Issued October 28, 2013
- Trash reduction plan
- TMDL Compliance Schedules

Working on updating the SWMP (Early 2015)
- Debris Cleaning Assessment Plan – evaluation of street sweeping for WLA reductions
- Cost per pound of pollutant removal
Thank You