



MS4 & Post-Construction Stormwater Management

**ASHE Altoona / PennDOT 9-0 Workshop
April 17, 2018**



Topics

- MS4 Permit Status
- Stormwater Control Measures (SCMs)
 - Publication 888
 - Inventory Database
 - Maintenance-IQ
 - Inspections
 - Training
 - Maintenance
- Construction/Maintenance Issues
- PCSM Plan Standards & Policy Update

MS4 Permit Status

- Current permit was to expire 7/2016
- Covers discharges into storm conveyance systems (pipes, swales, etc.) in urbanized areas
- Highways, rest areas, stockpiles, garages, etc.
- Administratively extended by DEP



INDIVIDUAL STATEWIDE PERMIT FOR DISCHARGES OF STORMWATER
FROM PENNSYLVANIA DEPARTMENT OF TRANSPORTATION (PENNDOT) ROADWAY SYSTEM
IN URBANIZED AREAS

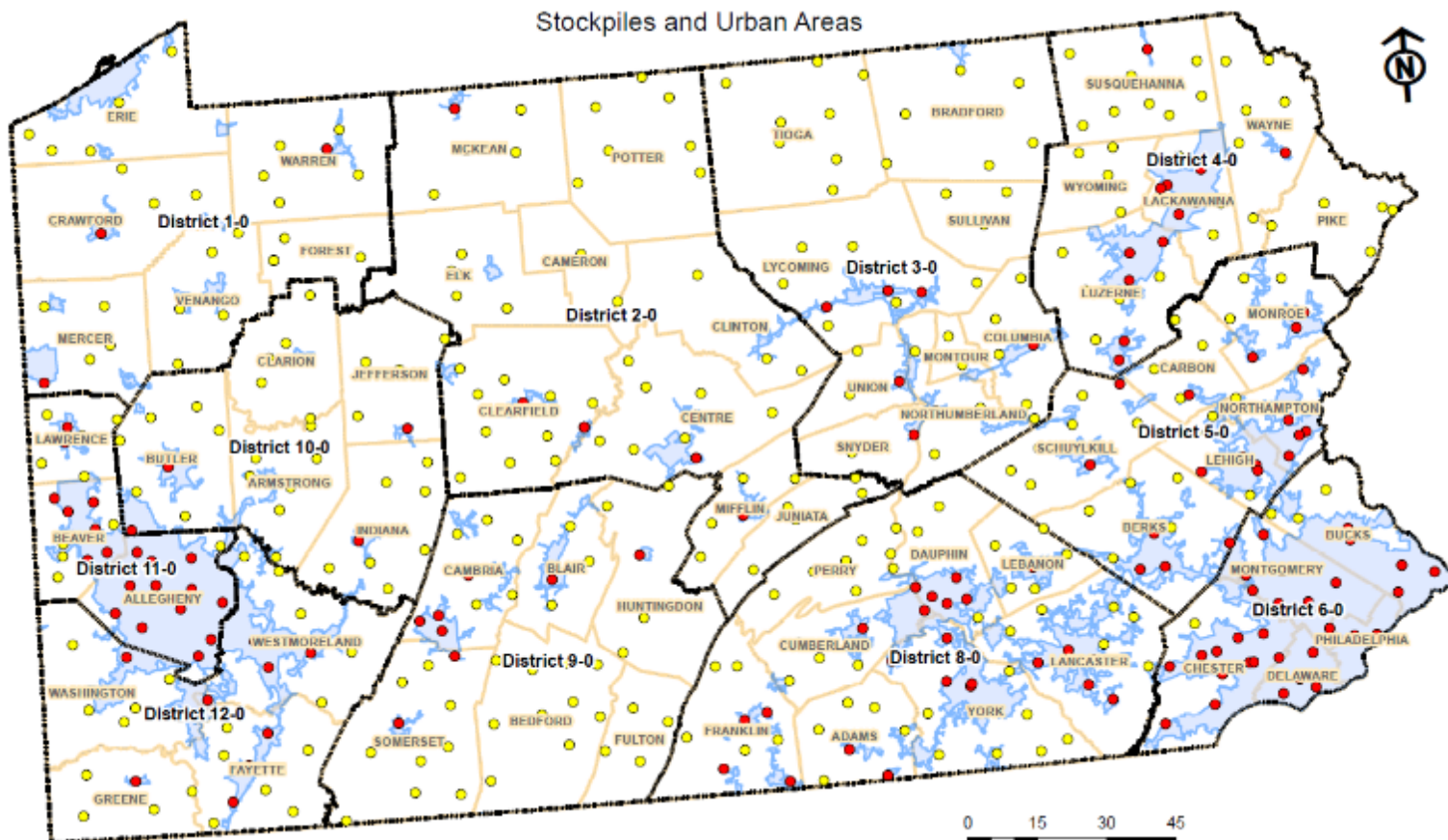
Issued to: Pennsylvania Department of Transportation
Keystone Building
400 North Street
Harrisburg, PA 17105



MS4 Permit Status

- 17,000 state road miles are in 2010 US Census urbanized areas
- 10,000+ outfalls
- 40,000 acres of roadway surface area (63 sq miles)
- District 9-0 has 555 acres
 - Altoona
 - Johnstown

MS4 Permit Status



- Stockpiles In 2010 Urban Areas
- Stockpiles Outside Urban Areas
- ▭ PennDOT Engineering Districts
- ▭ Urban Areas (2010)
- ▭ County Boundary



▶ MS4 Permit Status

- Includes 6 minimum control measures (MCMs)
 1. Public education and outreach on stormwater impacts
 2. Public involvement/participation
 3. Illicit discharge detection and elimination
 - 4. Construction site stormwater runoff control**
 - 5. Post-construction stormwater management**
 6. Pollution prevention/good housekeeping
(at maintenance facilities)
- Includes TMDL and Pollutant Reduction Plans

MS4 Permit Renewal

- MCM#4: Construction Site SW Runoff Control
 - **Goal:** Update E&S policies as necessary based on 25 PA Code Ch 102 and provide periodic training.
 - **Translation:** Do a better job at performing and documenting inspections during construction.



MS4 Permit Renewal

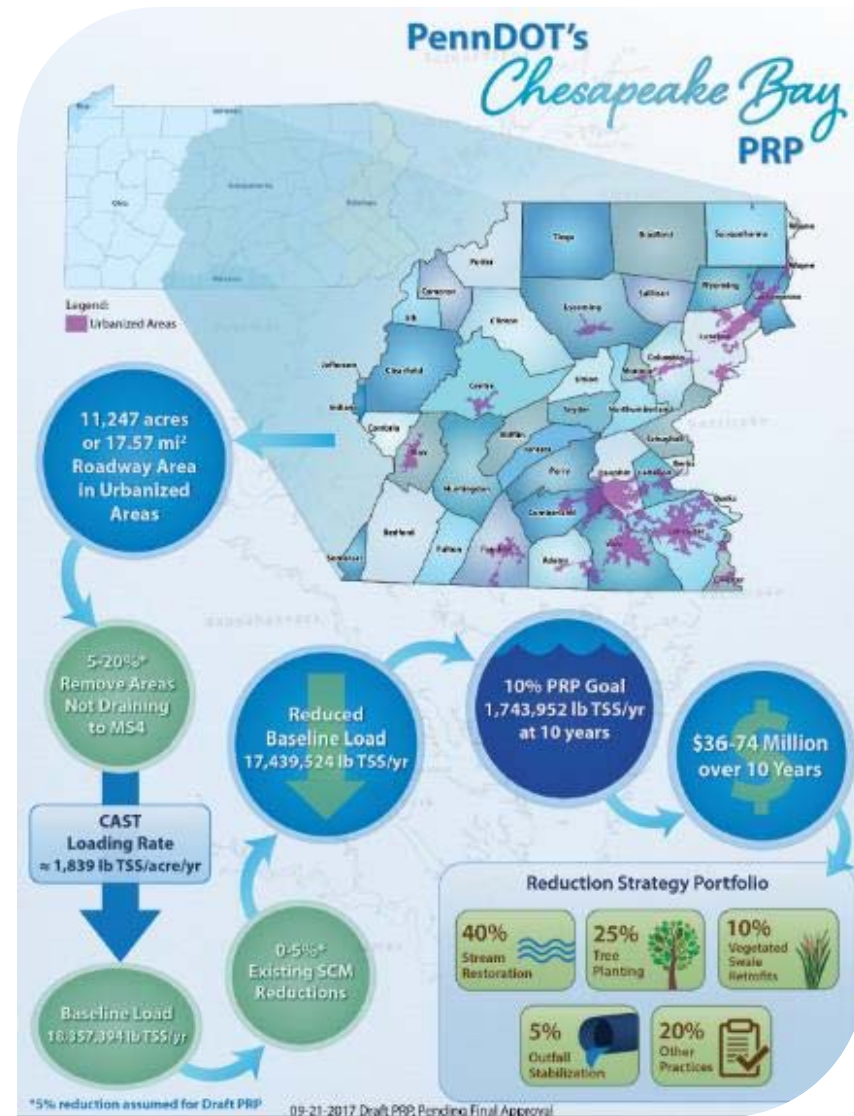
- MCM#5: PCSM in New/Re-Development Activities
 - **Goal:** Update inventory in urbanized areas...and ensure that SCMs are implemented, operated, and maintained...
 - **Translation:** Implement a program to map, inspect, and maintain SCMs.



MS4 Permit Renewal

Pollutant Reduction Plan

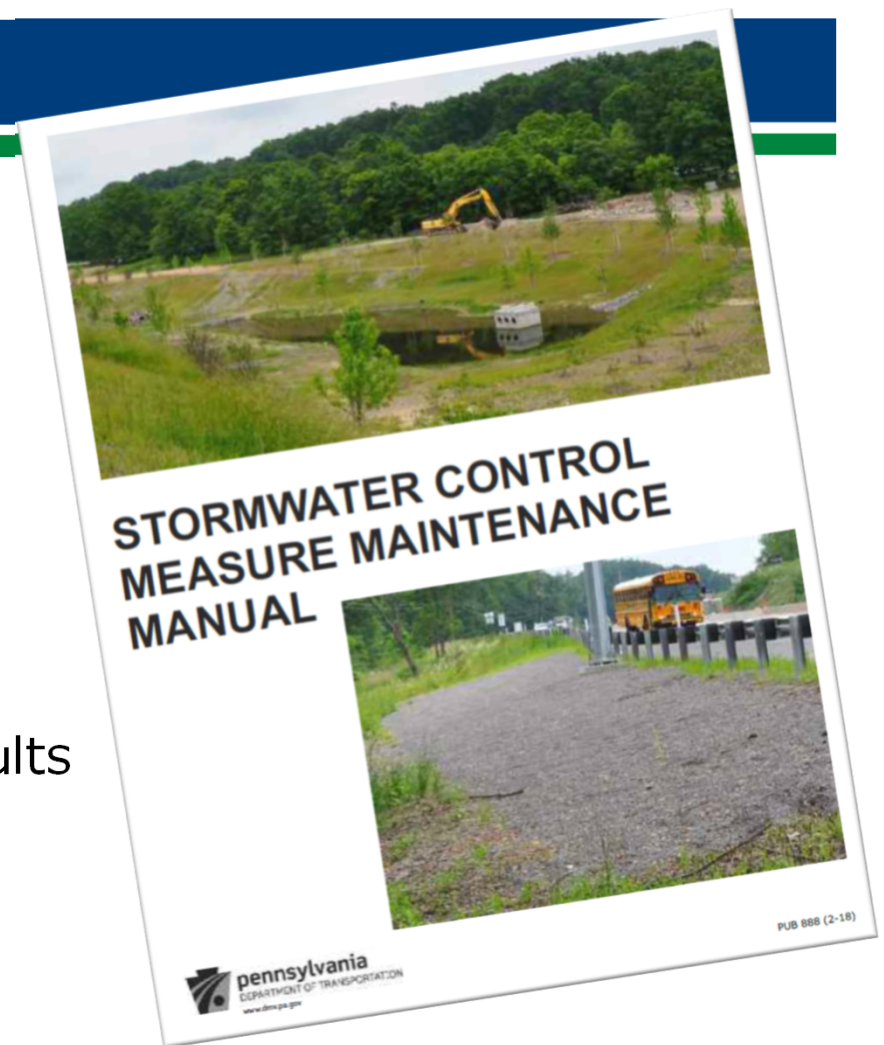
- Reduce annual sediment load contribution by "X"% in "Y" years
- Chesapeake Bay, Delaware River, Ohio River, Lake Erie
- Negotiating terms with DEP
- Will be a Department-wide coordinated effort



Publication 888

SCM Maintenance Manual

- Inventory procedures
 - IDs, adding/modifying data
- Inspections
 - Types and frequencies
 - Forms, report templates
 - Submitting and viewing results
- Maintenance
 - SCM specific procedures
 - Common SCM components
- Charging, recording, reporting
 - Assemblies and charge codes
 - Creating work notifications



SCM Inventory

- Major effort to inventory SCMs began in 2015
 - No previous centralized database of SCMs
 - 500+ projects reviewed
 - Data manually extracted from paper plans



Storm Water Control Measures
Type: Point | Result: 1 of 1

SCM_ID: 0510 BWD 001

SEQUENCE_NUMBER: 001

SCM_TYPE_CODE: BWD

SCM_TYPE_CODE_DESC: Basin, Wet Detention

DISTRICT_NO: 05

CTY_CODE: 06

COUNTY_NAME: Berks

DISTRICT_CTY_CODE: 0510

ST_RT_NO: 0222

SEG_NO: 0233

OFFSET: 31

JURIS: 1

SIDE_IND: 2

ROUTE_DIRECTION: S

CL_OFFSET: 91

LATITUDE: 40.36222

SCM Inventory

SCM_ID	SCM_TYPE_CODE	LATITUDE	LONGITUDE	DISTRICT_NO	COUNTY_NAME	ST_RT_NO	SECTION	DISCHARGE_DEST	DISCHARGE_DEST_NAME	CH_93_DESIG_USE_1	CH_93_DESIG_USE_2
0310 BID 001	BID	41.02618	-76.48149	03	Columbia	0042	047	SPE	Little Fishing Creek	CWF	MF
0310 SIT 001	SIT	41.00798	-76.25169	03	Columbia	0080	RST	SPE	UNT Nescopeck Creek	CWF	MF
0310 SIT 002	SIT	41.00798	-76.24985	03	Columbia	0080	RST	SPE	UNT Nescopeck Creek	CWF	MF
0310 SIT 003	SIT	41.00797	-76.24956	03	Columbia	0080	RST	SPE	UNT Nescopeck Creek	CWF	MF
0320 BDD 001	BDD	41.42812	-77.08657	03	Lycoming	0015	C41	SPE	Stream Valley Run	CWF	HQ-MF
0320 BDD 002	BDD	41.24680	-76.83084	03	Lycoming	0180	47	SPE	Margaret Run	WWF	MF
0320 BID 002	BID	41.43924	-77.09941	03	Lycoming	0015	C41	SPE	Stream Valley Run	CWF	HQ-MF
0320 BID 003	BID	41.43285	-77.09686	03	Lycoming	0015	C41	SPE	Stream Valley Run	CWF	HQ-MF
0320 BID 004	BID	41.44469	-77.10696	03	Lycoming	0015	C41	SPE	Stream Valley Run	CWF	HQ-MF
0320 BID 005	BID	41.46216	-77.13332	03	Lycoming	0015	C41	SPE	Stream Valley Run	CWF	EV-MF
0320 BID 006	BID	41.46215	-77.13328	03	Lycoming	0015	C41	SPE	Stream Valley Run	CWF	EV-MF
0320 BID 007	BID	41.48413	-77.14687	03	Lycoming	0015	C41	SPE	Stream Valley Run	CWF	EV-MF
0320 BID 008	BID	41.40624	-77.06480	03	Lycoming	0015	C41	SPE	Trout Run	CWF	HQ-MF
0320 BRE 001	BRE	41.19174	-76.91550	03	Lycoming	0015	140	SPE	UNT to Black Hole Creek	TSF	MF
0320 BRE 002	BRE	41.19198	-76.91562	03	Lycoming	0015	140	SPE	UNT to Black Hole Creek	TSF	MF
0320 BRU 001	BRU				Lycoming	0015	140	SPE	UNT to West Branch Susquehanna River	CWF	MF

Stormwater Management

- I&M Logs
- PCSM As-Built Plans
- SCM Inspections
- SCM Inventory
- _MIQ Flat Files
- District 01
- District 02
- District 03
- District 04
- District 05
- District 06
- District 08
- District 09
- District 10
- District 11
- District 12

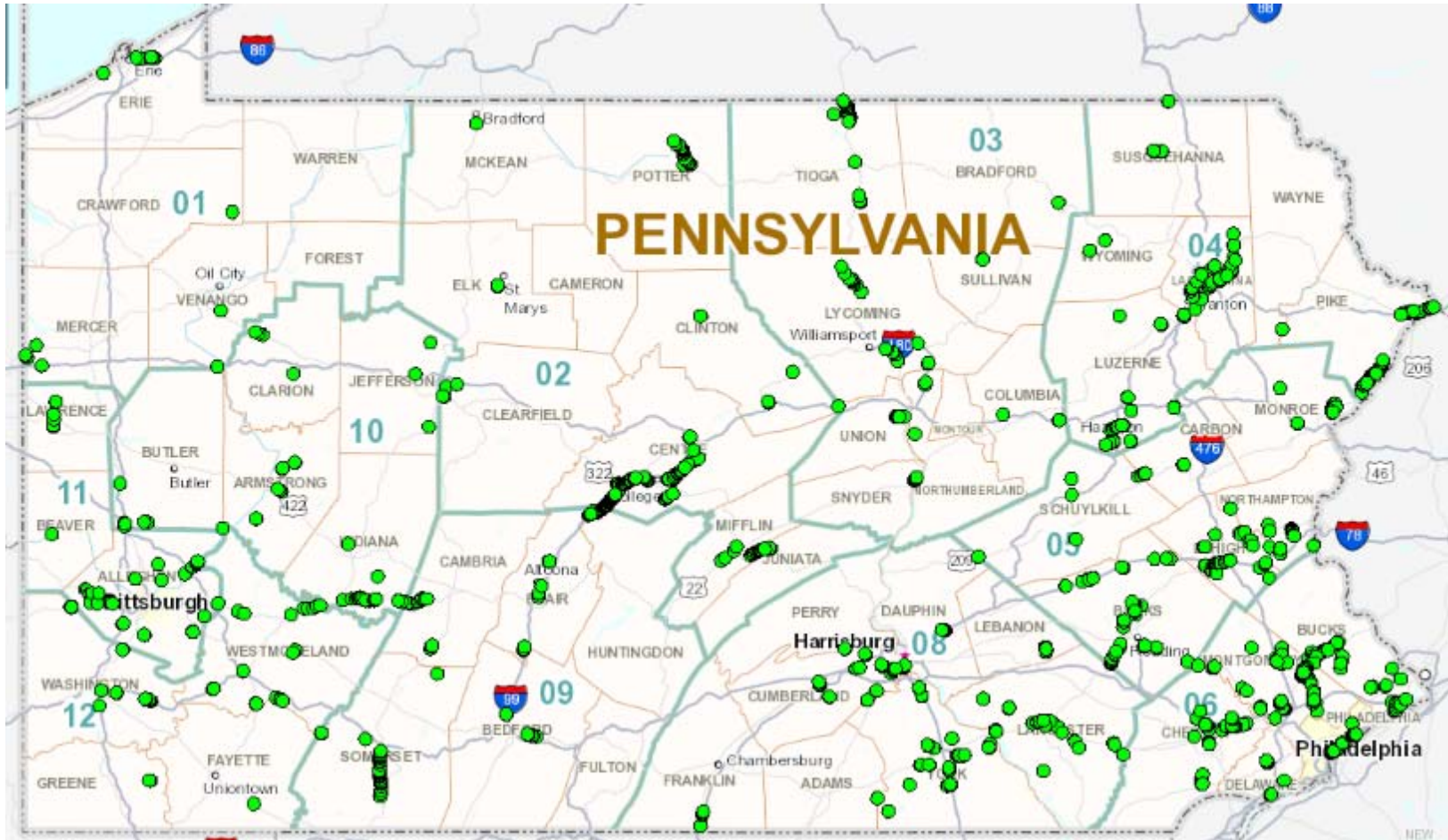


SCM Inventory

Type	#
Dry Detention Basins	499
Infiltration Basins	211
Wet Basins	103
Bioretention	211
Infiltration Trenches	194
Infiltration Berms	87
Vegetated Swales	589
Vegetated Filter Strips	21
Manufactured Treatment Devices	123
Media Filter Drains	13
Stormwater Wetlands	11
Total	2,062

SCMs currently in the inventory
(as of 4/2018)

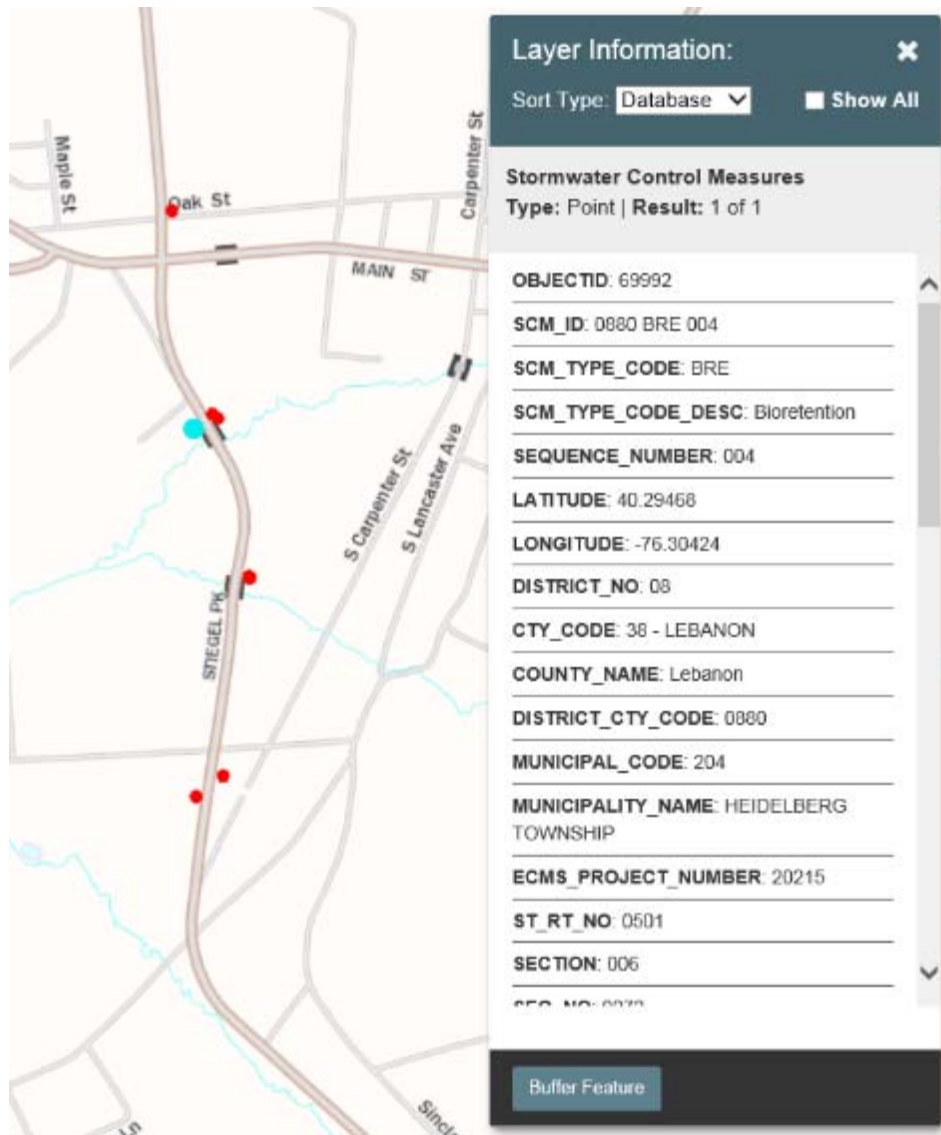
SCM Inventory



● - SCM LOCATION



► Maintenance-IQ



- Custom GIS application for PennDOT
- http://pdprgisiis01/maintenance_iq/xyz
- Helpful for planning inspections
- Can view inventory and inspection data

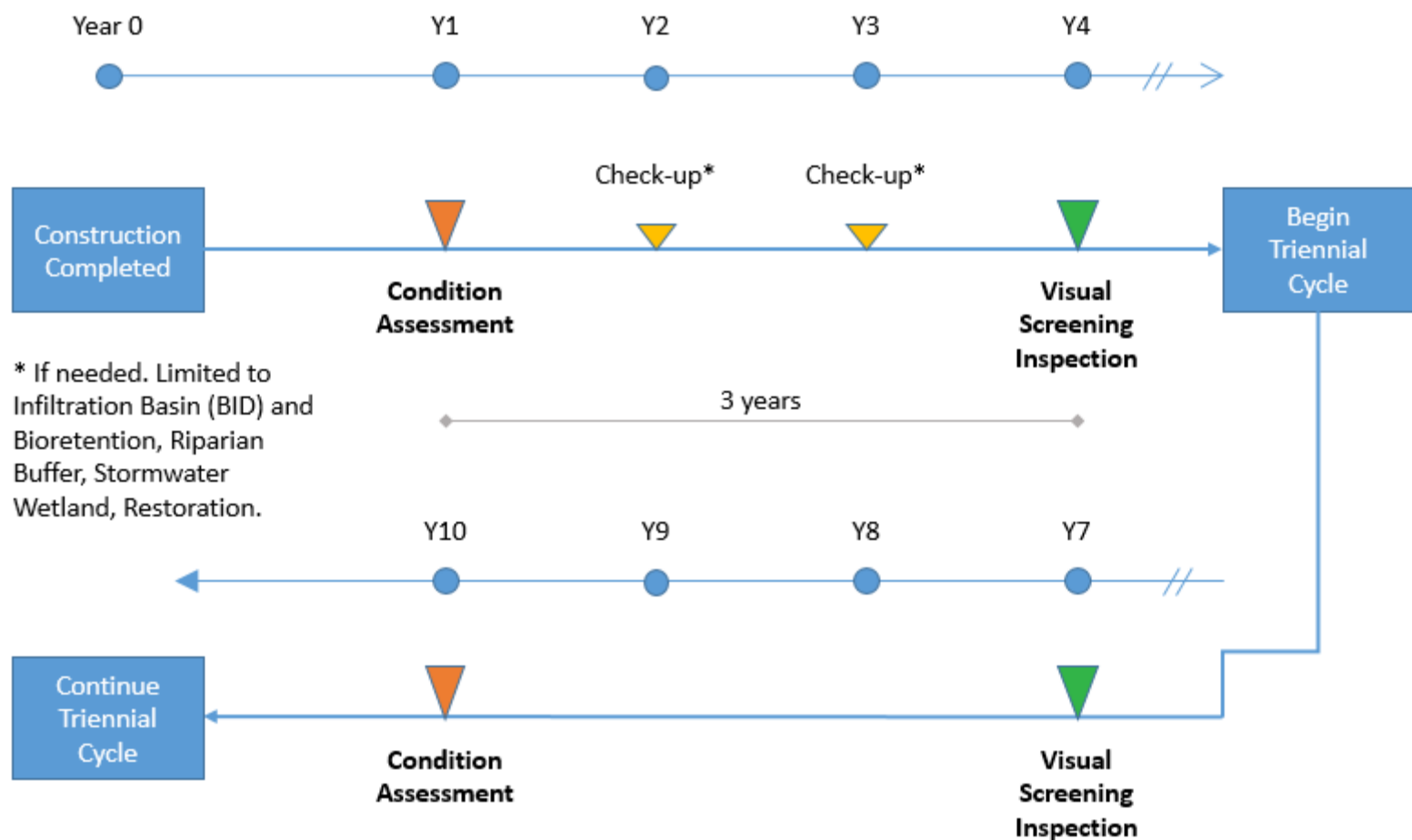
SCM Inspections

Two types of inspections:

- Visual Screening
 - Approximately 3 year cycle
 - 1-page checklist w/photo log
 - 1½ day training
- Condition Assessment
 - Within 1 year of construction, then every 10 years
 - Multi-page checklist w/photo log and report
 - 1½ day training (additional)
 - Engineering/environmental professional or apprenticeship required



SCM Inspections



SCM Inspections

Table 2: SCM Inspection Requirements

General SCM Type	SCM Type Code(s)	Start-Up Phase*	CAI Required	VSI Required	Spring-Fall Only
Basin	BDD, BED, BUD, BOT, BND, BWD		•	•	•
Bioretention	BRE, BRU	•	•	•	•
Filter	CSF, MFD		•	•	
Flow Dispersion	FDF, FDV, LSO		•	•	
Infiltration	BID, IBE, SIT	•†	•	•	•
Manuf. Treat. Device	MTD		•	•	
Permeable Pavement	PPA, PPC, PPP		•	•	
Riparian Buffer	RBE, RBO	•			•
Stormwater Wetland	SWE	•	•	•	•
Subsurface Detention	SDS		•	•	
Vegetated Filter Strip	VFS, VSS		•	•	•
Vegetated Swale	VSW, VSC		•	•	•
Restoration	FPR, RTP, LRM, SAR	•			•
Other	RSP, NBO		•	•	

*CAI at year 1; check-ups at years 2 and 3 or as indicated in future Pub. 888; VSI at year 4.

†BID only.

SCM Inspections

Training at 3 locations

2017

- Grantville, Nov.
- Indiana, Dec.

2018

- Allentown, Apr.



SCM Maintenance Requirements

1. MAINTENANCE ACTIVITIES TO BE DONE ANNUALLY AND WITHIN 48 HOURS AFTER EVERY MAJOR STORM EVENT (GREATER THAN 1 INCH RAINFALL DEPTH).
20. CATCH BASINS AND INLETS SHOULD BE INSPECTED AND CLEANED AT LEAST 2 TIMES PER YEAR.
31. INSPECT STORMWATER WET DETENTION BASINS, AT A MINIMUM, QUARTERLY AND AFTER A MAJOR RUNOFF EVENT GREATER THAN 1 INCH. INSPECT OUTLET STRUCTURES FOR DEBRIS. REMOVE SEDIMENT AND DEBRIS WHEN THE STORMWATER WET DETENTION BASIN IS RELATIVELY DRY.



SCM Maintenance Requirements

SWALE MAINTENANCE GUIDELINES	
ACTIVITY	SCHEDULE
REMULCH VOID AREAS. TREAT OR REPLACE DISEASED TREES AND SHRUBS. KEEP OVERFLOW FREE AND CLEAR OF LEAVES.	AS NEEDED
REMULCH VOID AREAS. TREAT OR REPLACE DISEASED TREES AND SHRUBS. KEEP OVERFLOW FREE AND CLEAR OF LEAVES.	MONTHLY
INSPECT TREES AND SHRUBS TO EVALUATE HEALTH.	BIANNALLY
ADD ADDITIONAL MULCH. INSPECT FOR SEDIMENT BUILDUP, EROSION, VEGETATIVE CONDITIONS, ETC.	ANNUALLY
MAINTAIN RECORDS OF ALL INSPECTIONS AND MAINTENANCE ACTIVITY.	ONGOING
WHEN THE BMP IS NO LONGER IN WORKING CONDITION, RESTORE AS PER PLAN DETAIL TO ITS ORIGINAL CONDITION.	



Which is it?

SCM Maintenance

SCMs require two basic types of maintenance:

- Routine preventative
 - Performed on regular cycles and can be scheduled far in advance of the work.
- Corrective
 - Needs are uncovered through inspections and preventative maintenance activities.



SCM Maintenance

Routine maintenance frequency by SCM category

SCM	Grass Maint.	Vegetation Mgmt.	Litter Control	Sediment Removal	
Basin (BDD, BED, BUD, BOT, BND, BWD)	○	●	●	○	
Bioretention (BRE, BRU)	●	○	●	○	
Filter (CSF, MFD)	●	●	●	●	
Infiltration (BID, IBE, SIT)	○	●	●	○	
Manuf. Treatment Device (MTD)	X	X	◐	○	
Permeable Pavement (PPA, PPC, PPP)	◐	X	◐	○	
Riparian Buffer (RBE, RBO)	X	○	○	X	
Stormwater Wetland (SWE)	●	●	●	○	
Subsurface Detention (SDS)	X	X	○	○	
Vegetated Filter Strip (VFS, VSS)	●	○	●	○	
Vegetated Swale (VSW, VSC)	○	●	●	○	
Key:	X N/A	○ As Needed	● Annual	◐ Semi-annual	◑ Monthly

Construction/Maintenance Issues

- We may find SCMs that:
 - Was not constructed per the “as-built” plan
 - Does not treat the drainage area intended
 - Was not constructed at all (!)
 - Has not been converted from E&S to PCSM
 - Is in disrepair and requires rehabilitation
 - Can’t be accessed with equipment by maintenance
- Many of these issues can be avoided:
 - Review of PCSM Plan by a team of people from different disciplines
 - Proper construction oversight



[This Photo](#) by Unknown Author is licensed under [CC BY-NC-ND](#)

▶ PCSM Plan Standards

- DM-3 modified to include PCSM Plans
- Clearance Transmittal in near future

*Chapter 6 - Contour Grading and Drainage Plans,
Erosion and Sediment Pollution Control Plans,
and Post Construction Stormwater Management Plans*

Publication 14M (DM-3)
2015 Edition- Change #2

CHAPTER 6

CONTOUR GRADING AND DRAINAGE PLANS,
EROSION AND SEDIMENT POLLUTION CONTROL PLANS,
AND
POST CONSTRUCTION STORMWATER MANAGEMENT PLANS

PCSM Policy Update

- Pub. 13M (DM-2) and Pub. 584 (PDM) updates related to PCSM design
- Highlights include:
 - Eliminating PCSM levels
 - Revised water quality calculations
 - Defining points of interest and points of analysis
 - Revised BMP (SCM) Toolbox
 - Infiltration testing and test pit guidelines
- Clearance Transmittal in near future

Questions

