

# National Trends in Post-Construction Stormwater Management



# Agenda

- Project Overview
- Post-Construction Requirements  
Categorization
- Examples
- Data collected
- 2016 EPA MS4 Compendium Series

## Four General Categories

- **Narrative** – brief description that there needs to be a post-construction effort
- **Water quality/treatment** – post-construction runoff needs to be treated for so much percent pollutant removal
- **Retention or volume based** – retain a certain volume or storm return frequency on site
- **Retention and treatment** – retain a certain volume or storm return frequency and treat the remainder



# Narrative Approach

(5) Post-construction storm water management in new development and redevelopment. (i) **You must develop, implement, and enforce a program to address storm water runoff from new development and redevelopment projects that disturb greater than or equal to one acre, including projects less than one acre that are part of a larger common plan of development or sale, that discharge into your small MS4.** Your program must ensure that controls are in place that would prevent or minimize water quality impacts.

(ii) You must:

(A) Develop and implement strategies which include a combination of structural and/or non-structural best management practices (BMPs) appropriate for your community;

(B) Use an ordinance or other regulatory mechanism to address post-construction runoff from new development and redevelopment projects to the extent allowable under State, Tribal or local law; and

(C) Ensure adequate long-term operation and maintenance of BMPs.



Photo Credit: Alisha Goldstein, EPA



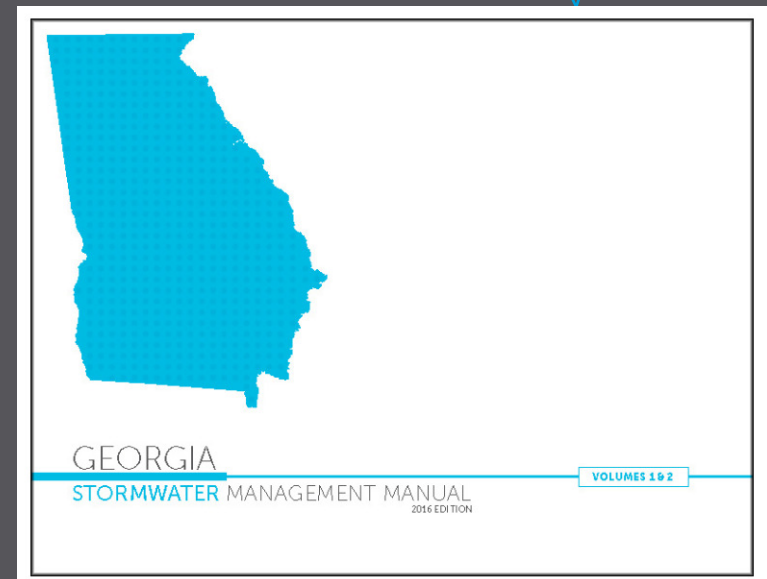
Photo Credit: Alisha Goldstein, EPA

# Water Quality/Treatment Approach

**Water quality/treatment**  
post-construction runoff  
needs to be treated for so  
much percent pollutant  
removal

**Georgia** - Treat runoff from  
85% of storms (1.2”  
rainfall)

**Kentucky** - ...water-quality  
treatment standard... to  
manage runoff ... the  
equivalent surface depth of  
runoff (e.g. 0.75 inches)  
produced from an 80th  
percentile precipitation event.





# Retention Approach

Retention or volume based – retain a certain volume or storm return frequency on site

## West Virginia -

Keep and manage on site 1” rainfall from 24 hour storm preceded by 48 hours of no rain



<http://www.dep.wv.gov/WWE/Programs/stormwater/MS4/green/WVU/Pages/default.aspx>

# Retention and Treatment Approach

Retention and treatment – retain a certain volume or storm return frequency and treat the remainder

## Minnesota -

No net increase in stormwater discharge volume from pre-project conditions (on an annual average basis)

No net increase from pre-project conditions (on an annual average basis) of TSS, TP.

Minnesota Pollution Control Agency [www.pca.state.mn.us](http://www.pca.state.mn.us)



### Minnesota Minimal Impact Design Standards



#### What is Minimal Impact Design Standards?

Minimal Impact Design Standards (MIDS) represent the next generation of stormwater management in Minnesota. The emphasis today is on keeping the raindrop where it falls in order to minimize stormwater runoff and pollution and preserve natural resources. Low Impact Development (LID) is an approach to stormwater management that mimics a site's natural hydrology as the landscape is developed and preserves and protects environmentally-sensitive site features such as riparian buffers, wetlands, steep slopes, valuable (mature) trees, floodplains, woodlands and highly permeable soils.

Minnesota's new MIDS offers guidelines, recommendations and tools that will help LID be implemented more uniformly across Minnesota's landscape and provides guidance to effectively implement the concepts and practices LID promotes and encourages.

MIDS contains four main elements to meet these needs:

- A stormwater volume performance goal for new development, redevelopment and linear that will provide enhanced protection for Minnesota's water resources.
- New credit calculations that will standardize the use of a range of innovative structural stormwater techniques.
- Design specifications for a variety of green infrastructure best management practices (BMPs).
- A model MIDS ordinance package that will help developers and communities implement MIDS.

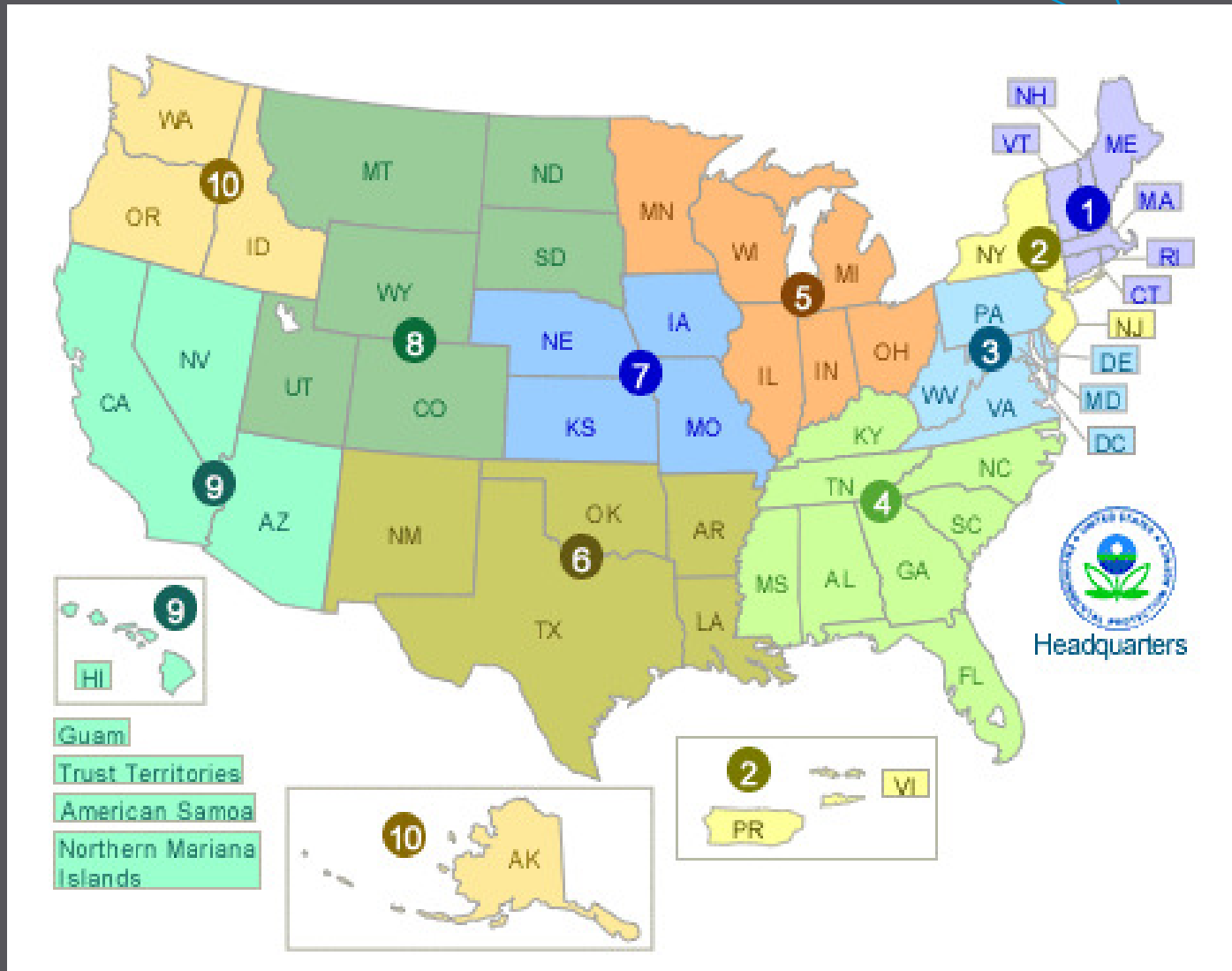


Tree trenches at Maplewood Mall

#### What are the benefits?

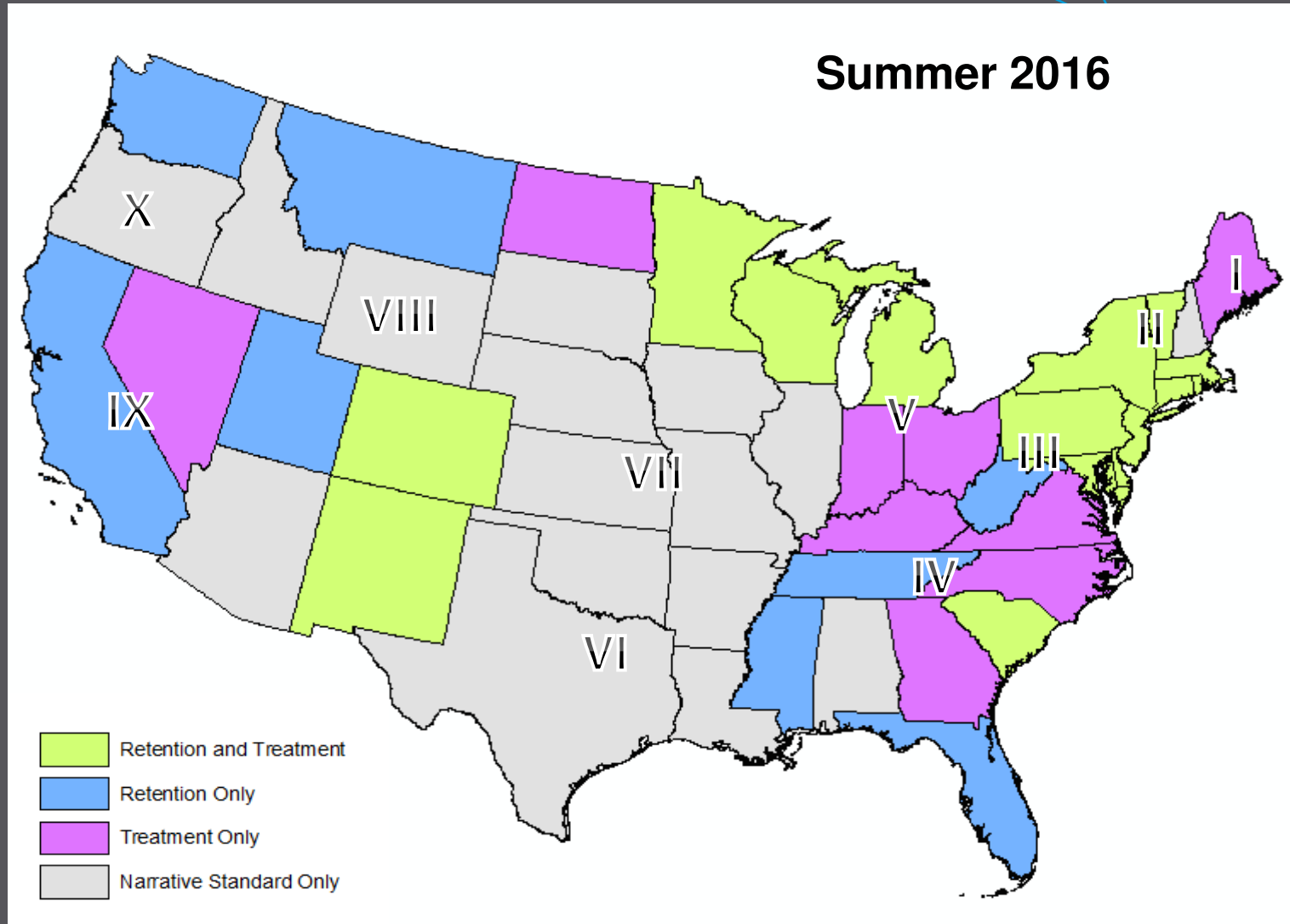
Adapting and using LID approaches offers multiple benefits including minimizing and reducing the amount of pollution reaching our lakes, rivers and streams and helps to recharge groundwater resources. MIDS establishes unified LID standards, approaches and credits so we can consistently apply these principals across Minnesota communities. MIDS helps communities measure progress toward water and natural resource protection and restoration goals. MIDS will also be used as the highest standard for meeting the stormwater practice for Minnesota Green Step Cities.

# EPA Regions

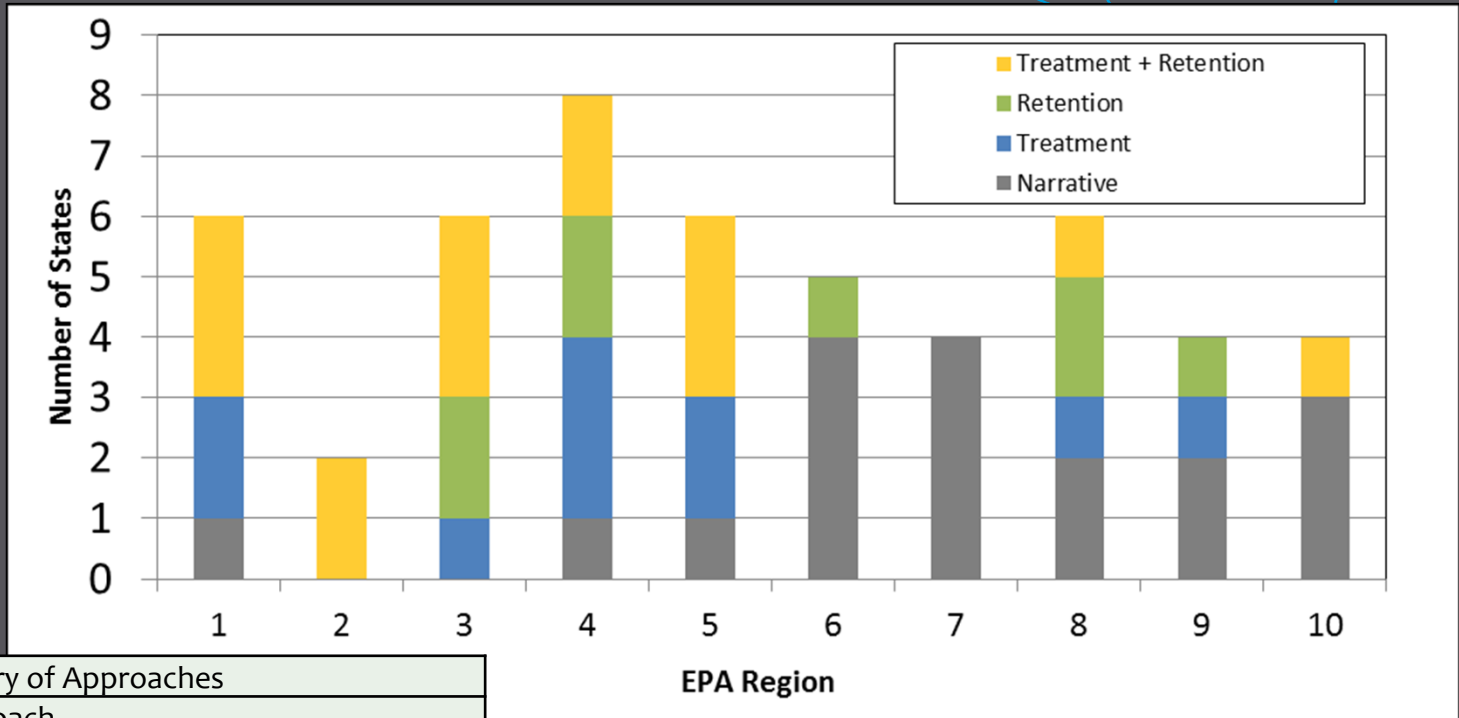




# Geography of Four General Approaches



# Geography of Four General Approaches - All

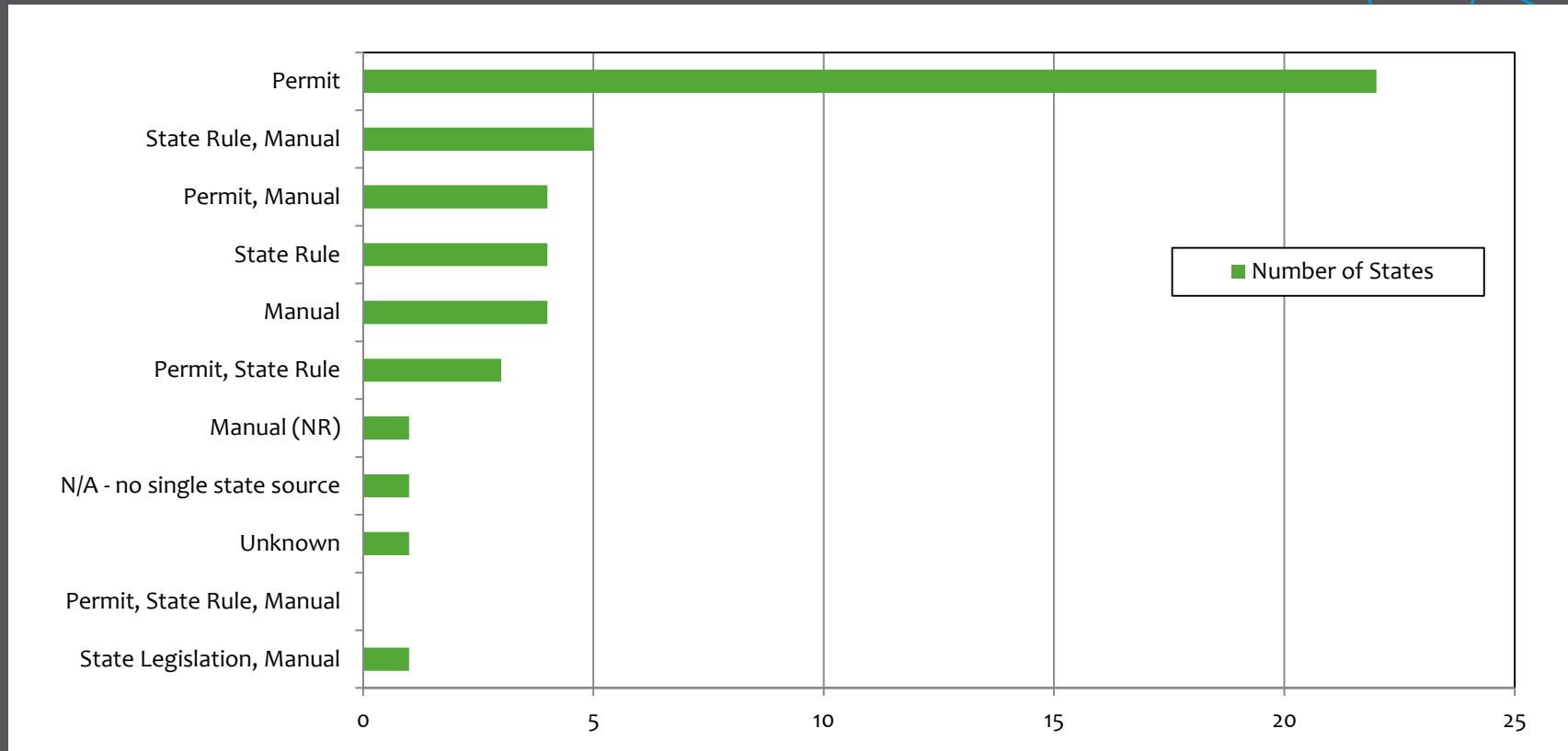


Summary of Approaches				
Region	Approach			
	Narrative	Treatment	Retention	Treatment + Retention
1	1	2	-	3
2	-	-	-	2
3	-	1	2	3
4	1	3	2	2
5	1	2	-	3
6	4	-	1	-
7	4	-	-	-
8	2	1	2	1
9	2	1	1	-
10	3	-	-	1
TOTAL	18	10	8	15

Summer 2016



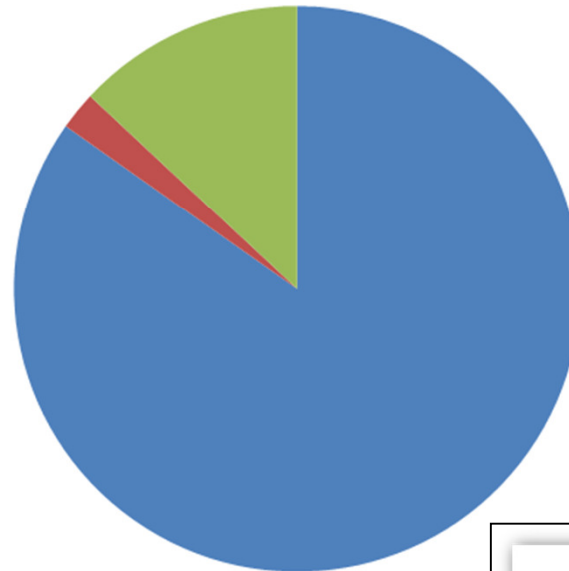
# MS4 Phase II General Permit - Post-Construction Standard Sources



# BMP Maintenance Requirements

## Phase II General Permits with Maintenance Requirements

EPA Region	Maintenance Requirement in Permit
1	6 mandatory
2	2 mandatory
3	2 mandatory
4	6 mandatory
	1 optional
5	5 mandatory
6	5 mandatory
7	2 mandatory
8	6 mandatory
9	4 mandatory
10	1 mandatory
TOTAL	40



- Mandatory
- Voluntary/Optional
- None

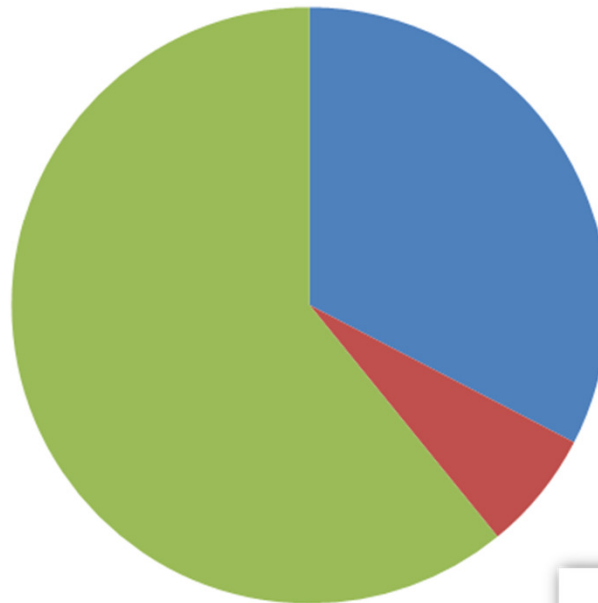




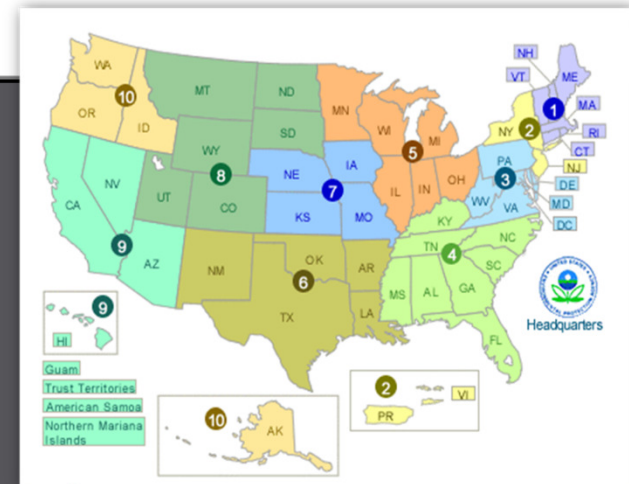
# BMP Ownership/Legal Liability for Maintenance

## Phase II General Permits with BMP Ownership/Legal Liability for Maintenance

EPA Region	BMP Ownership/Legal Liability for Maintenance Permit
1	1 optional
2	1 mandatory in permit further requirements in NJ State Rules
3	2 mandatory
4	5 mandatory
5	3 mandatory
6	2 optional
7	1 mandatory
8	2 mandatory
9	1 mandatory
10	-
<b>TOTAL</b>	<b>18</b>

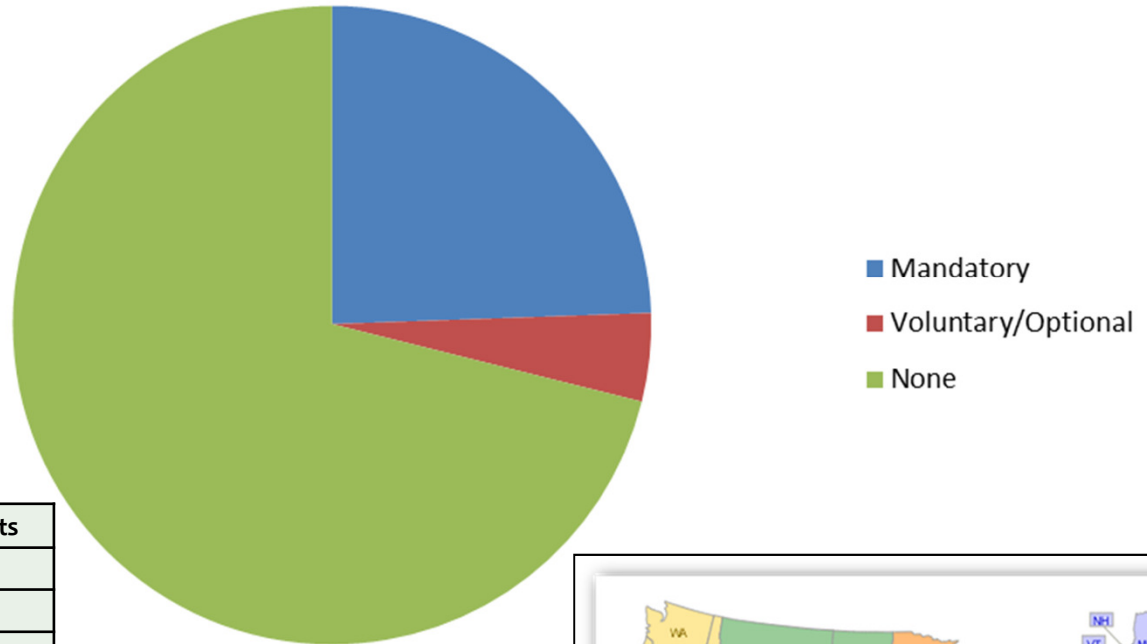


- Mandatory
- Voluntary/Optional
- None

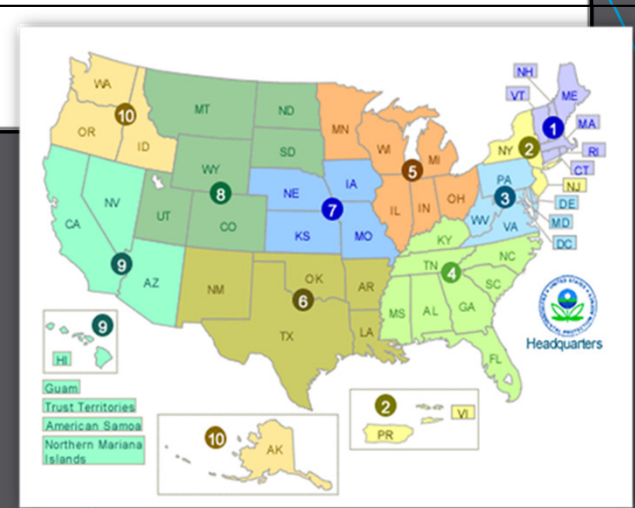


# Flood Control Requirements

## Phase II General Permits with Flood Control

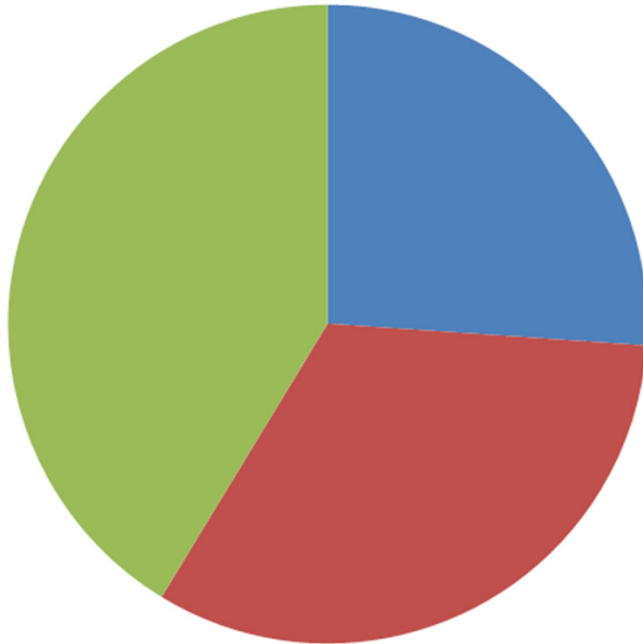


EPA Region	States with Flood Control in Permits
1	1 mandatory
2	1 mandatory
3	-
4	3 mandatory
5	3 mandatory
6	2 mandatory
7	-
8	1 optional
9	1 mandatory
	1 optional
10	-
TOTAL	13



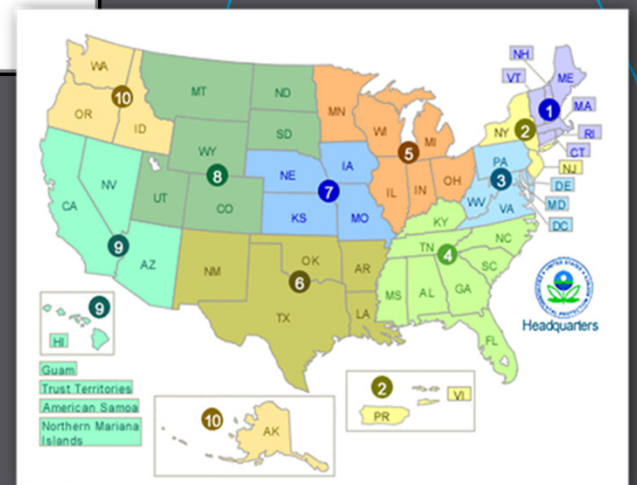
# LID Requirements

## Phase II General Permits with LID



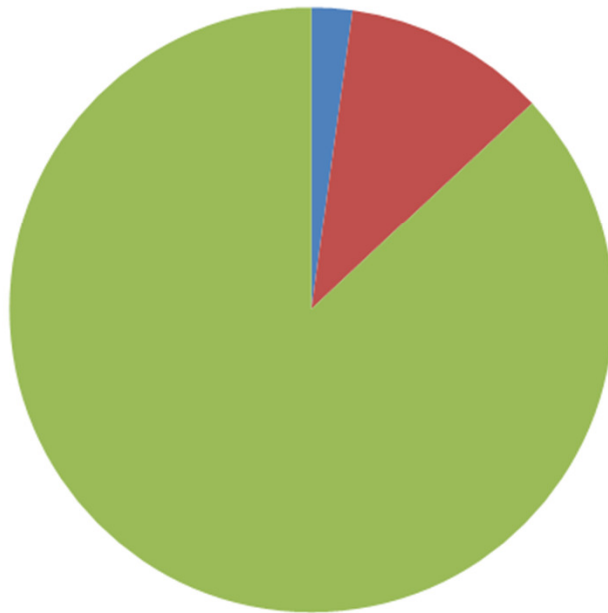
- Mandatory
- Voluntary/Optional
- None

EPA Region	States with LID in Permits
1	3 mandatory
	1 optional
2	1 NJ refers to rules
	1 NY optional
3	1 mandatory
	1 optional
4	1 mandatory
	4 optional
5	1 mandatory
	2 optional
6	1 mandatory
	3 optional
7	1 optional
	1 mandatory
8	1 optional
	2 mandatory
9	1 mandatory*
	1 optional
TOTAL	27



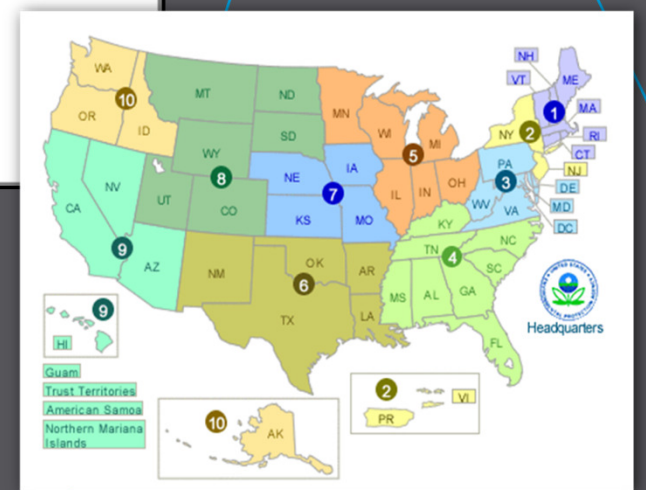
# Off-site Mitigation/Fee-in-Lieu Requirements

## Phase II General Permits with Off-Site Mitigation/Fee-in-Lieu



- Mandatory
- Voluntary/Optional
- None

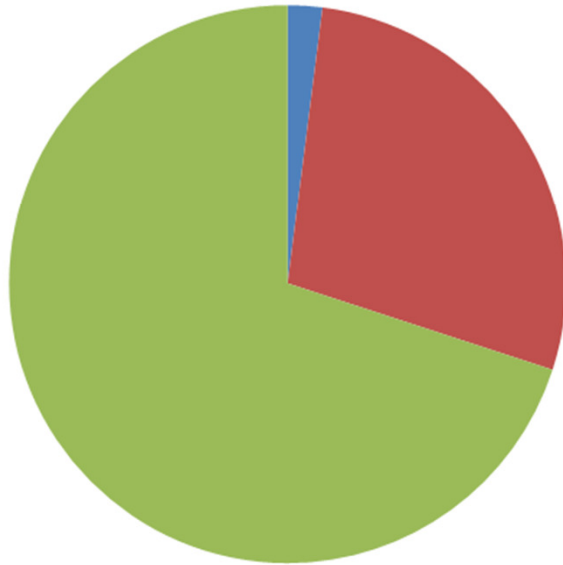
EPA Region	States with Provisions in Permit
1	1 optional
2	1 optional
3	1 optional
4	1 optional
5	1 mandatory
	1 optional
6	-
7	-
8	-
9	-
10	-
TOTAL	6





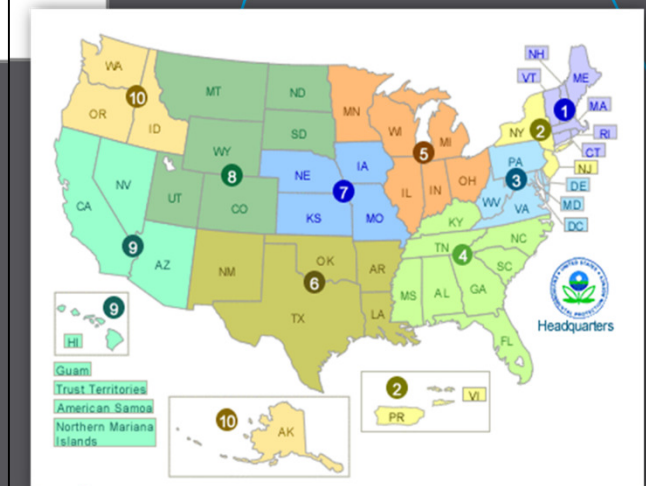
# Credits and Incentives

## Phase II General Permits with Credits/Incentives

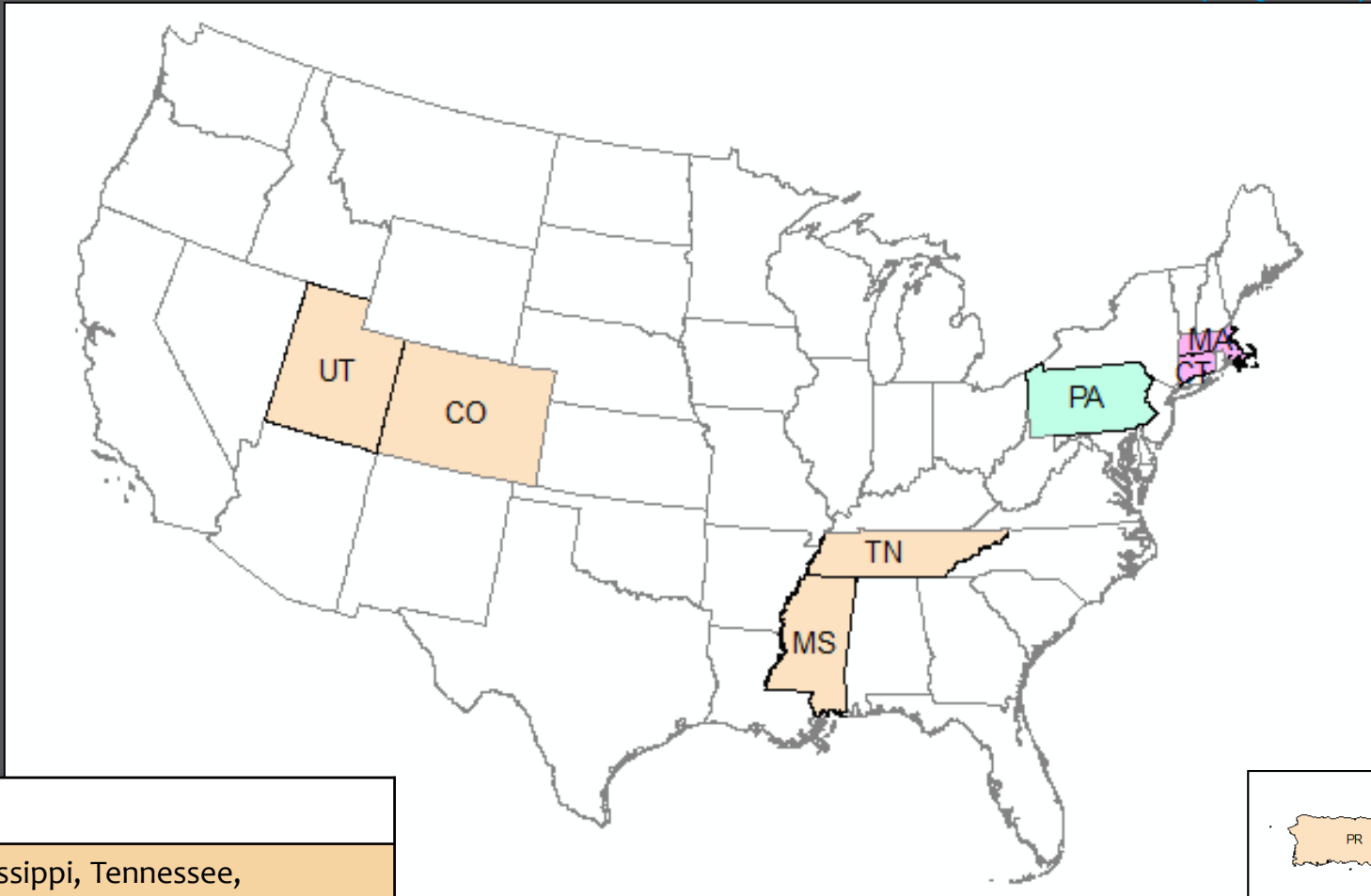


- Mandatory
- Voluntary/Optional
- None

EPA Region	States with Credits/ Incentives in Permit
1	-
2	-
3	1 mandatory
	2 optional
4	5 optional
5	1 optional
6	3 optional
7	1 optional
8	1 optional
9	-
10	1 optional
TOTAL	15



# State Post-Construction Updates



Year	State
2016	Mississippi, Tennessee, Colorado, Utah, & Puerto Rico
2017	Connecticut & Massachusetts
2018	Pennsylvania

# Questions

John Ricketts, PE

423-598-0682

[john.ricketts@aecom.com](mailto:john.ricketts@aecom.com)

Kristen Dunaway

502-457-4778

[kristen.dunaway@aecom.com](mailto:kristen.dunaway@aecom.com)

**AECOM**