

BGE Stormwater Management Facility Inventory, Maintenance & Inspection Program

**MD/DC Utilities Association
Environmental Conference
October 10, 2019**

**Kevin Hedge, PWS, AICP
BGE EMU Project Management
Contractor**

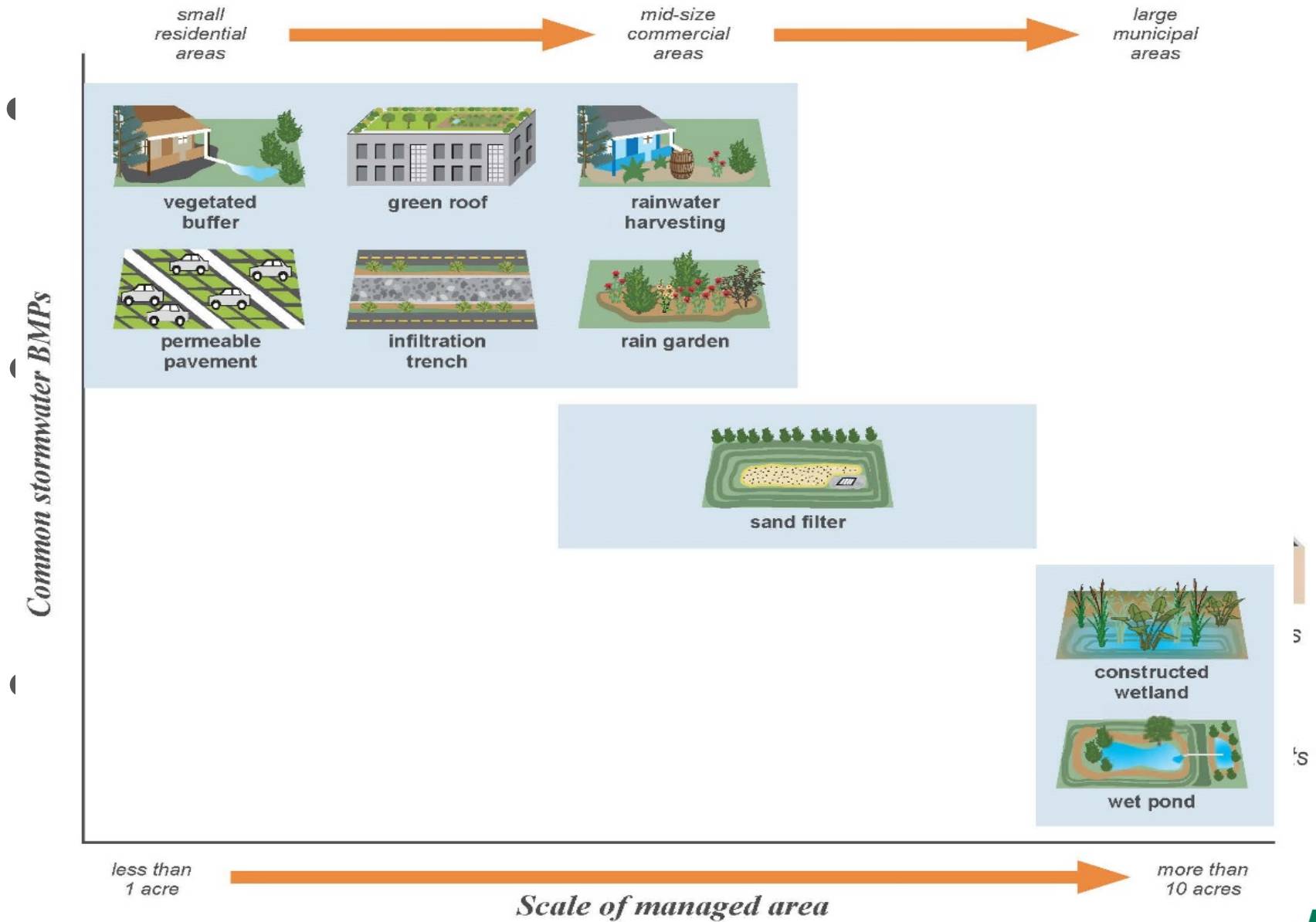


An Exelon Company

Agenda

- Stormwater Basics
- The Problem
- The Motivation
- The Plan
- What did we learn?
- What can we do better?
- What do we do next?

Basics of Stormwater

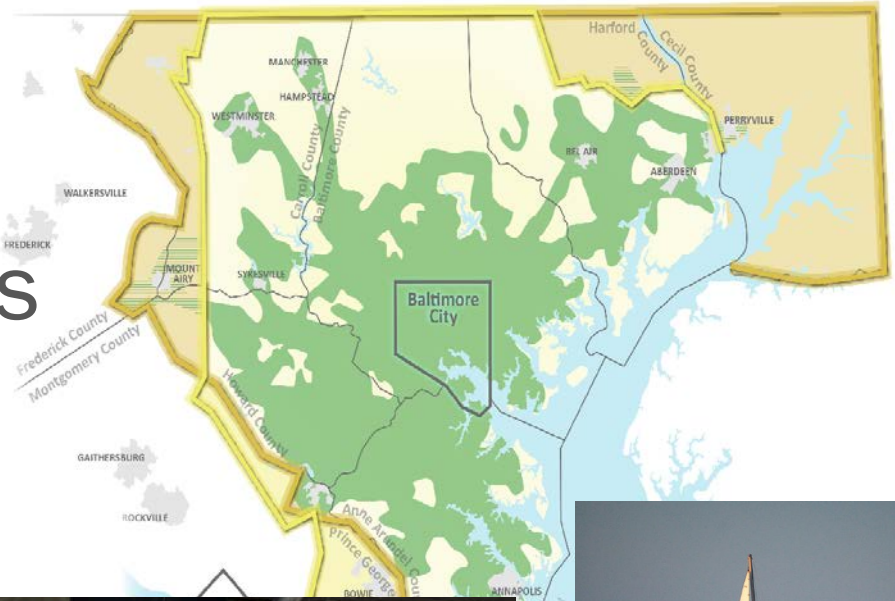


The Problem

- BGE asked to self certify SWM facilities
- Unsure of what we had
- Closer look revealed potential issue
- Improvement needed

The Motivation

- Corporate Environmental Policies
- Service Area
- EMS Improvements
- Clean water!



•2019 Improvement Actions

- Identify Stormwater Management (SWM) Facilities
 - Identify County requirements for SWM facilities
 - Make recommendations to enhance the maintenance program.
-
- Develop administrative procedure to meet local requirements

Stormwater Facility Inventory – The Plan

Phase 1 – Research & Data Gathering

- Current knowledge
- Data searches
- Document findings
- Maintenance requirements

Phase 2 - Analysis

- Key Information
- Performance
- Strengths/Weaknesses

Phase 3 – Closeout

- Enhancements
- Planning
- Communication

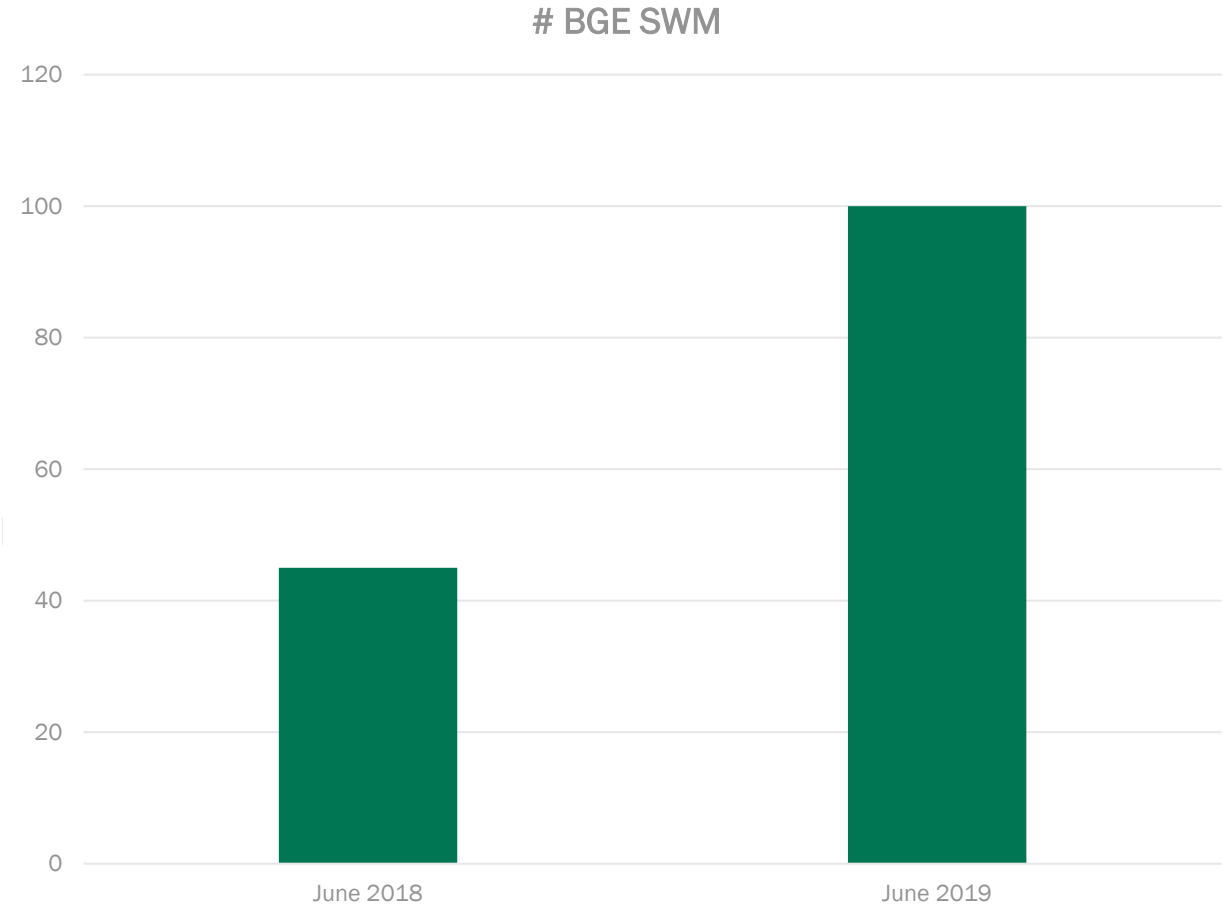


SWM Facility Inventory : Phase 1

BGE SWM POND		2018 Cutting Schedule									
Rev 1	10/24/2018 nwh										

Current knowledge

Data Search



SWM Facility Inventory : Phase 1

Document findings and track progress

BMP Type

Maint Agmt

Yr Built

Date of Last Inspection

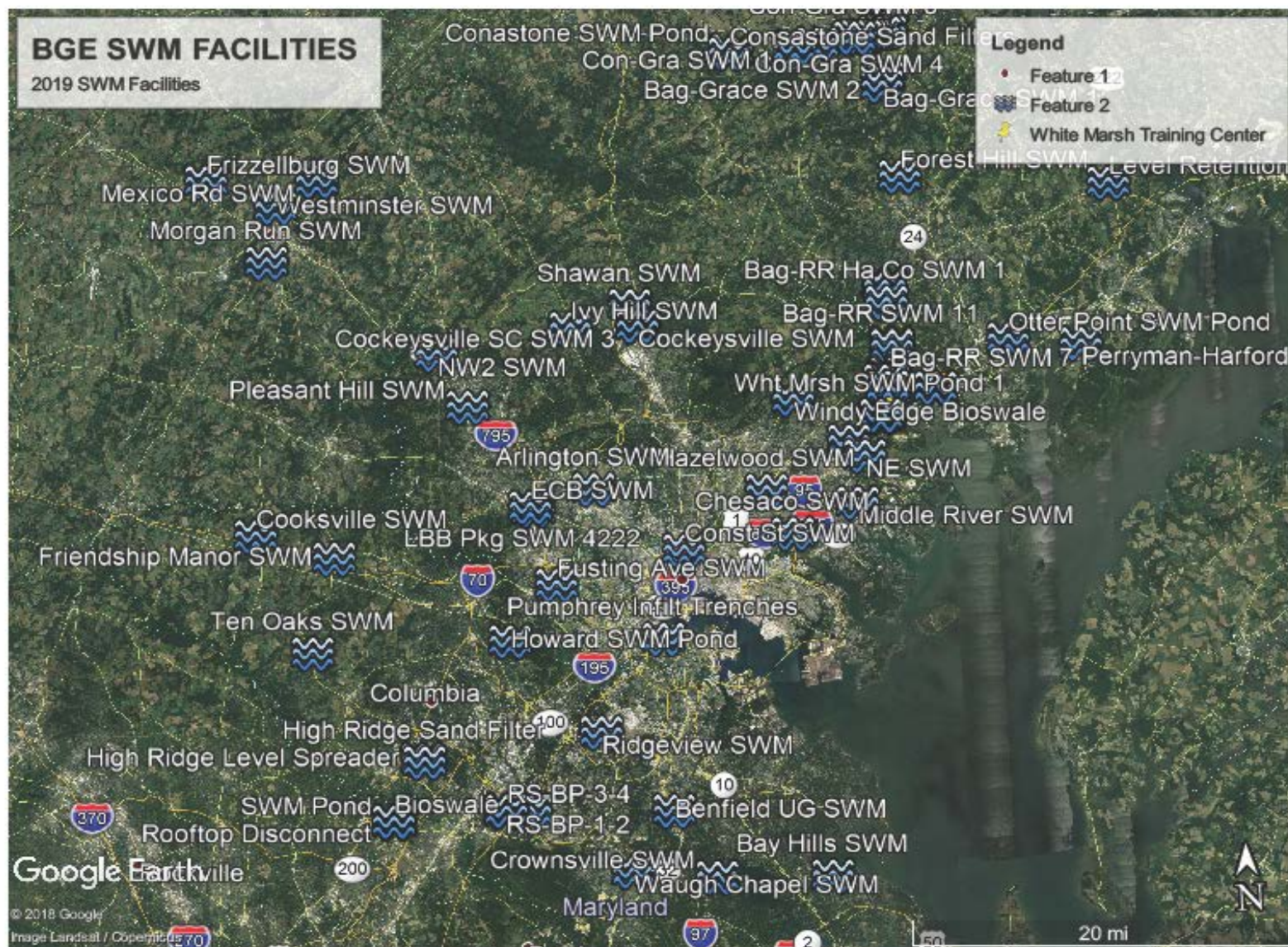
Asbuilt Plan

Date of Next Inspection

Facility Name	Location	BMP Type	Design Engineer	County/City Facility ID	BGE Facility ID	Yr Built	Asbuilt Plan	Yr Appvd	Maint Agmt	Notes	Plans?	Date of Last Inspection	Work Required (Y/N)	Date of Next Inspection	SWM Bond Amt	SWM Bond Remng
Arlington	Balt City	Sand Filter	WRA			2008?	No		Sent to C Burton 02-29-08		Yes					
Bagley	Harford	Stone Filter	Demario	91350		2012-2013	Yes	2013	Rec 04-26-11 L.09153 F.354	Inside fence, 4 obs wells	Yes	4/12/2018	N	4/12/2019	\$186,400.00	
Bagley	Harford	Grass filter strip	Demario	91350		2012-2013	Yes	2013	Rec 04-26-11 L.09153 F.354	south side access rd, erosion Apr 2018	Yes	4/12/2018	Y	4/12/2019		
Bagley	Harford	Infiltration Berm	FSH/ERI			2012-2013	Not Required		Not required		Yes	N/A	N/A	N/A		
Bay Hills	Anne Arundel	Detention Pond				1988	No	1988	Agmt #88-579 recorded 8/26/88 at L.4677 F.250	Converted Sediment Trap, inspected 3-6-96 work needed, 5-8-96 work needed, 7-17-02 work needed,	Yes	7/17/2002	Y	Unknown		
Benfield	Anne Arundel	trench	McCrone			1995	Yes	1997	Agmt #95-2398 recorded 11/07/95 at L.7209 F.668	Trench inspected 2002, appeared well maintained	Yes, SE/Variance Plan	5/30/2002	N	Unknown		
Camp Small	Balt City	SWM Pond	Century			2018	TBD		TBD						\$108,000.00	
Chesaco Park Sub	Baltimore	Level spreader	FSH/ERI			2013	Yes	2013		Asbuilt plan approved 06-12-13	Yes	4/29/2019		5/1/2022		\$1,500.00
Chesapeake Beach	Calvert	Stormceptor	FSH/BGE	N/A		2019	Not required		Not required	To replace infiltration trench	Yes	N/A	N/A	N/A		
Chestnut Hill	Howard	Micro-bioretentation	FSH/ERI			2019	TBD			Not built yet						
Chestnut Hill	Howard	Infiltration	FSH/ERI			2019	TBD			Not built yet						
Chestnut Hill	Howard	Trench	FSH/ERI			2019	TBD			Not built yet						
Chestnut Hill	Howard	Grass Swale	FSH/ERI			2019	TBD		Recorded w/ Land swap Agmt 10/12/16							
Chestnut Hill	Howard	Dry Wells	FSH/ERI			2019	TBD			Not built yet						
Conastone	Harford	Detention Pond	KCI		Phase 1	2007	Yes	2009	Rec. 06-22-07 L.07415 F.492	SWM pmt 07-91107-001	Yes	2/4/2009	Y	Unknown		
Conastone	Harford	Sand filter	KCI	91365	SF-1	2008	Yes	2009	Rec. 09-24-07 L.07539 F.562	Phase 2-3, wrong sand in filter Oct 2018	Yes	2/21/2018	Y	6/1/2019		
Conastone	Harford	Sand filter	KCI	91365	SF-2	2008	Yes	2009	Rec. 09-24-07 L.07539 F.562	Phase 2-3	Yes	2/21/2018	Y	6/1/2019		
Conastone	Harford	Sand filter	KCI	91365	SF-3	2008	Yes	2009	Rec. 09-24-07 L.07539 F.562	Phase 2-3	Yes	2/21/2018	Y	6/1/2019		
Conastone	Harford	Sand filter	KCI	91365	SF-4	2008	Yes	2009	Rec. 09-24-07 L.07539 F.562	Phase 2-3	Yes	2/21/2018	Y	6/1/2019		
Constitution St	Balt City	Sand Filter	Century	ESD 6794		2017	Yes	2018	BGE prepared 2017		Plan only					
Cooksville	Howard	Dry Extended														
Cooksville	Howard	Detention Pond	GW Stephens	1019	SDP-92-103	1993	Yes	1995		SDP-92-13		5/1/2009		Unknown		
Crownsville	Anne Arundel	Large infiltration pond	Harms	880		1995	Yes	1995	SWM Agmt #92-1396 rec 10/1/92 at L.5775 F.435	Part of SPCC Plan, K Costello	Road-Fence Only	7/7/2014				
Crystal Springs	Anne Arundel	Sand Filter	FSH		PSF A-1	2002-2003	Not Req	2002	Recorded 8/22/2002 at L.12917 f. 098	8060 Brock Bridge Rd, Jessup. Grp 4 BMP. O&M notes on SWM Notes Details Sht	Yes					

SWM Facility Inventory : Phase 1

Document findings



SWM Facility Inventory : Phase 1 – Maintenance Requirements

MAINTENANCE & REPAIR SCHEDULE

MAINTENANCE AND REPAIR SHALL BE CONDUCTED IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS. IN GENERAL, THE PRACTICES CONTAINED IN THE "MAINTENANCE AND REPAIR" CHAPTER OF THE "MARYLAND DAM SAFETY MANUAL". DNR-MRA 1988, SHOULD BE FOLLOWED AND CONDUCTED UNDER THE SUPERVISION OF A QUALIFIED PROFESSIONAL.

AT A MINIMUM THE STORMWATER MANAGEMENT FACILITY SHALL BE INSPECTED

BI-ANNUALLY FOR

1. CONDITION
2. CONDITION
3. CONDITION
4. SEDIMENT
5. EVIDENCE
6. EVIDENCE

THE EMBANKMENT

INSPECTION AND MAINTENANCE AGREEMENT

AGREEMENT NUMBER

PERMIT NUMBER

grantor/grantee name: oge
Reference/Control #:
Agreement Surcharge 40.00
LP - Additional Recording 0.00
SubTotal: 60.00
Total: 62.00
THIS 16th day of,
2013 by and between BALTIMORE GAS & ELECTRIC

Infiltration Areas

An infiltration area is a small trench filled with stone that collects rainwater from paved surfaces such as driveways and allows it to absorb into the surrounding soil. An infiltration area receives rainwater from surface runoff and are common on residential lots, where they are typically located next to driveways and around 20 feet from a building. Their location can be identified by the stone at the surface.

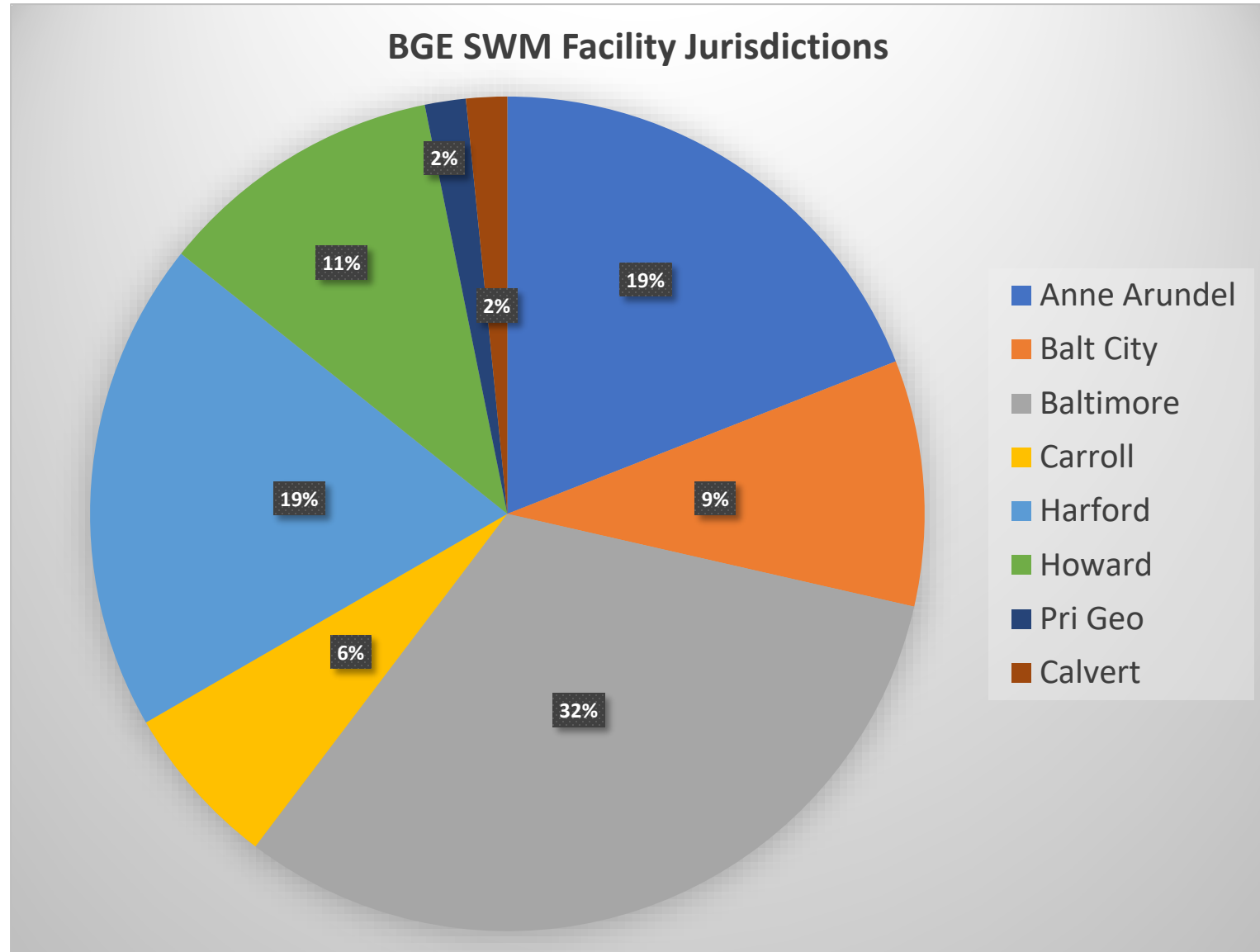
Recommended timeframes for routine maintenance

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Remove sediment, leaves and debris		•			•			•			•	
Remove trash	•	•	•	•	•	•	•	•	•	•	•	•
Weeding infiltration area					•	•	•	•	•	•		
Erosion control	— As needed —											

Types	Class
Detention Pond	Pond
Infiltration trench	Infiltration
Large infiltration pond	Infiltration
Sand Filter	Sand
Sand Filter	Sand
Level spreader	Misc
Water Quality Structure	Pond
Large infiltration pond	Infiltration
Medium infiltration pond	Infiltration
Bioretention pond	Bio
Bioretention pond	Bio
Bioretention pond	Bio
Bioretention pond	Bio
Infiltration berm	Infiltration
Submerged Gravel Wetland	Wetland
Infiltration trench	Infiltration
Multi-stage Wet retention pond	Pond

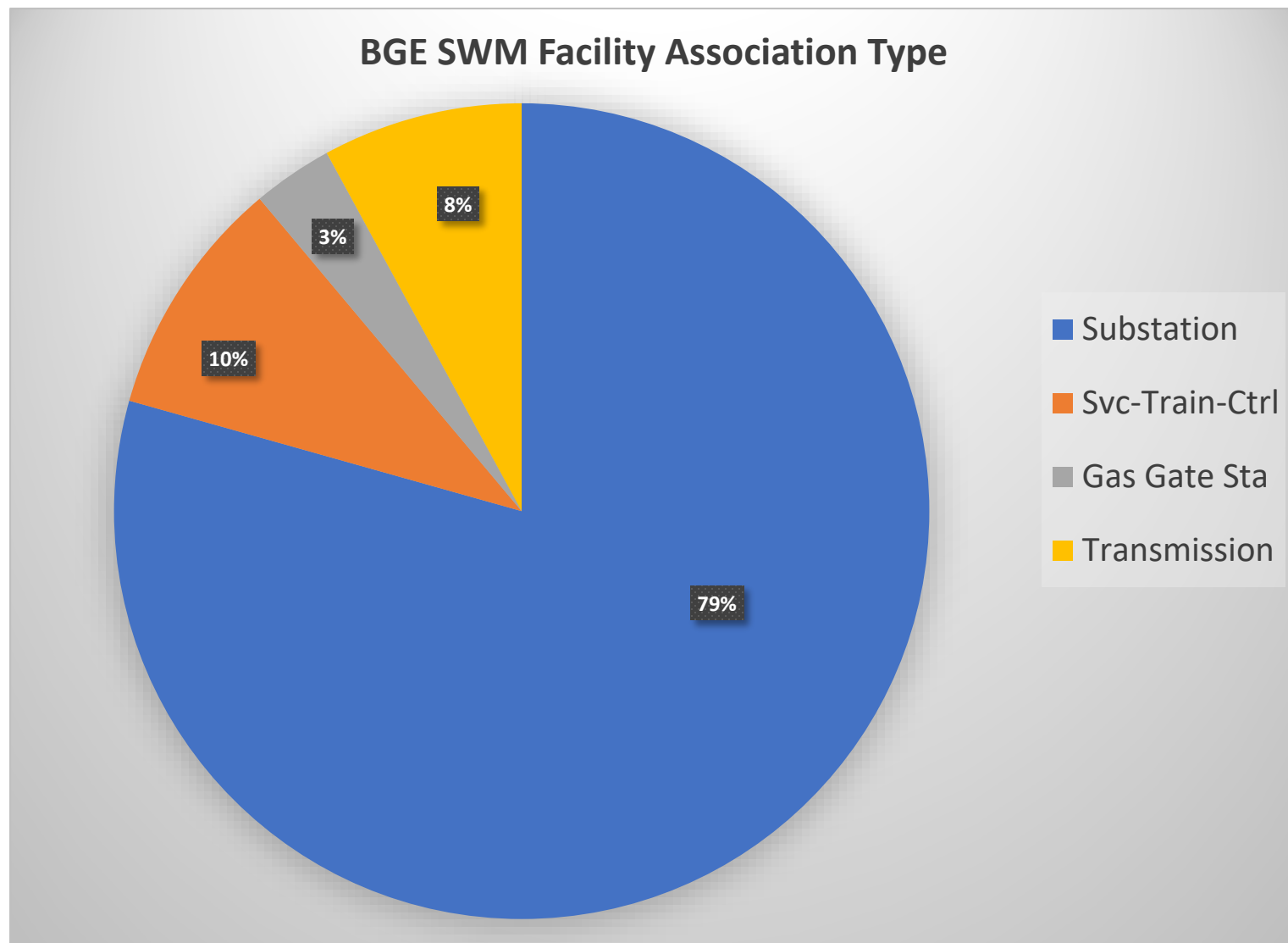
SWM Facility Inventory : Phase 2 Analysis – Key Information

Location



SWM Facility Inventory : Phase 2 Analysis – Key Information

Associations



SWM Facility Inventory : Phase 2 Analysis – Key Information

Type of Facility

BGE Stormwater Facility Type

SWM Ponds (26) include:
Retention, detention & generic
stormwater ponds

Infiltration features (18)
include: Trenches, berms,
ponds

Grass features (10) include:
Swales & filter strips

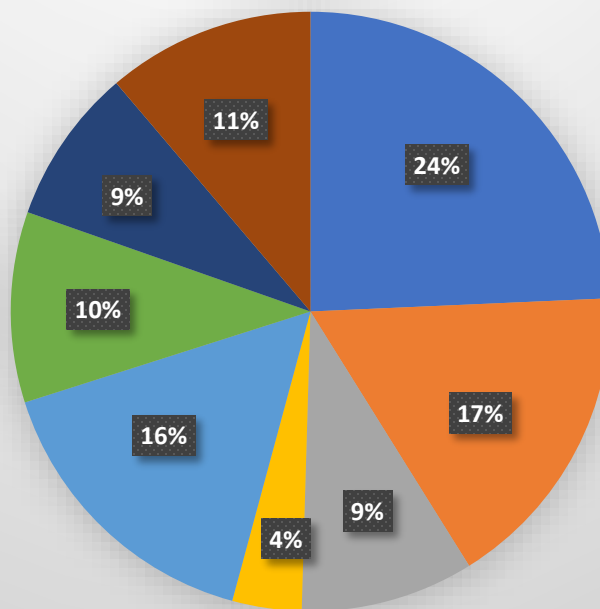
Stone filter (4) features
include: station areas & stone
filter strips.

Sand filter (17) features

Bio-features (11) include:
Bioretention ponds &
bioswales

Wetland features (9) are
Submerged Gravel Wetlands

Misc Features (12) are: Level
spreader, Dry well &
Stormceptor



- SWM Ponds
- Infiltration Features
- Grass Features
- Stone Filter
- Sand Filter
- Bio-features
- Wetland Features
- Misc Features

SWM Facility Inventory : Phase 2 Analysis – Type of Facility

Stormwater Management Pond



SWM Facility Inventory : Phase 2 Analysis – Type of Facility

Infiltration Trench



Sand Filter



SWM Facility Inventory : Phase 2 Analysis – Type of Facility

Grass Swale



SWM Facility Inventory : Phase 2 Analysis – Type of Facility

Bioswale



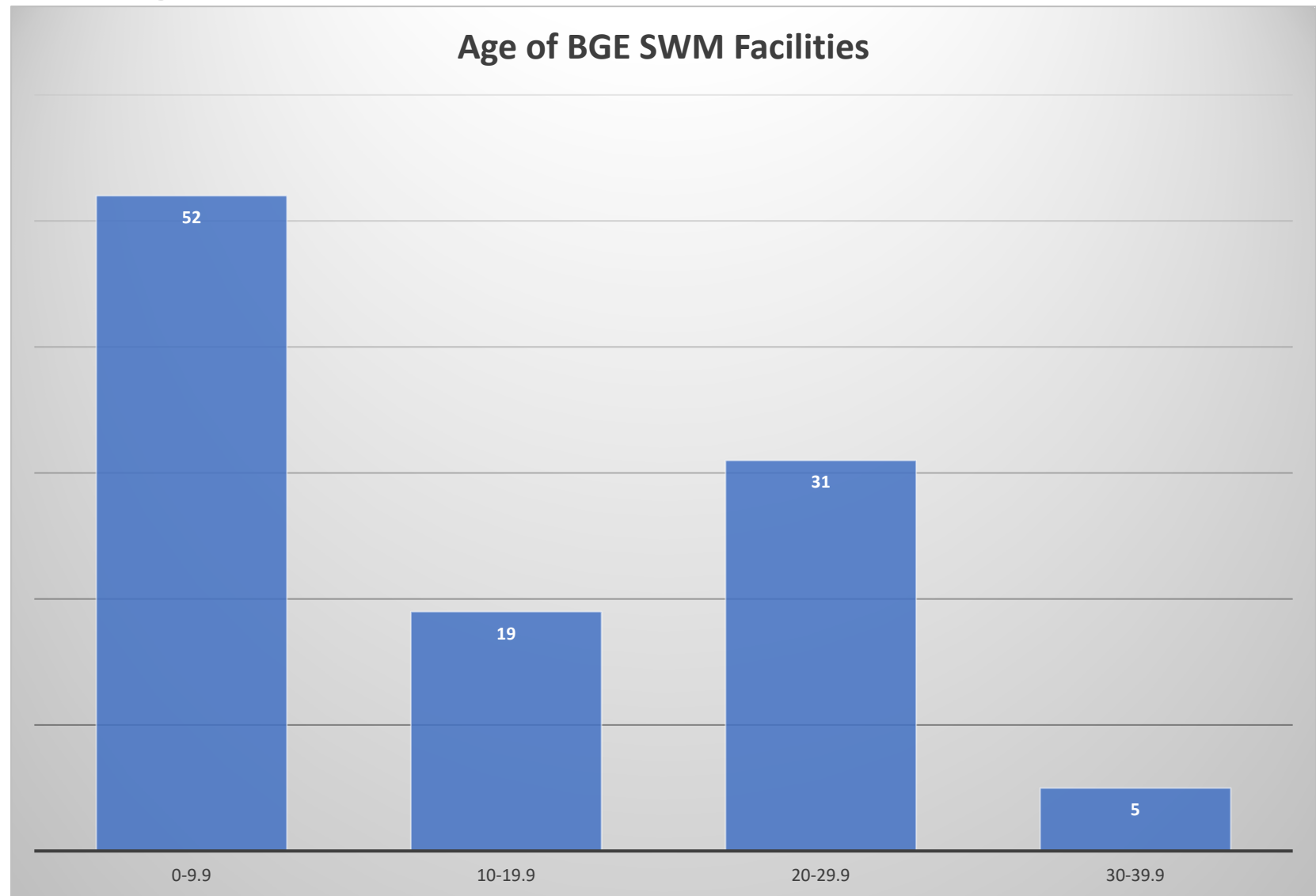
SWM Facility Inventory : Phase 2 Analysis – Type of Facility

Bioretention



SWM Facility Inventory : Phase 2 Analysis – Key Information

Facility Age



SWM Facility Inventory : Phase 2 Analysis - Performance

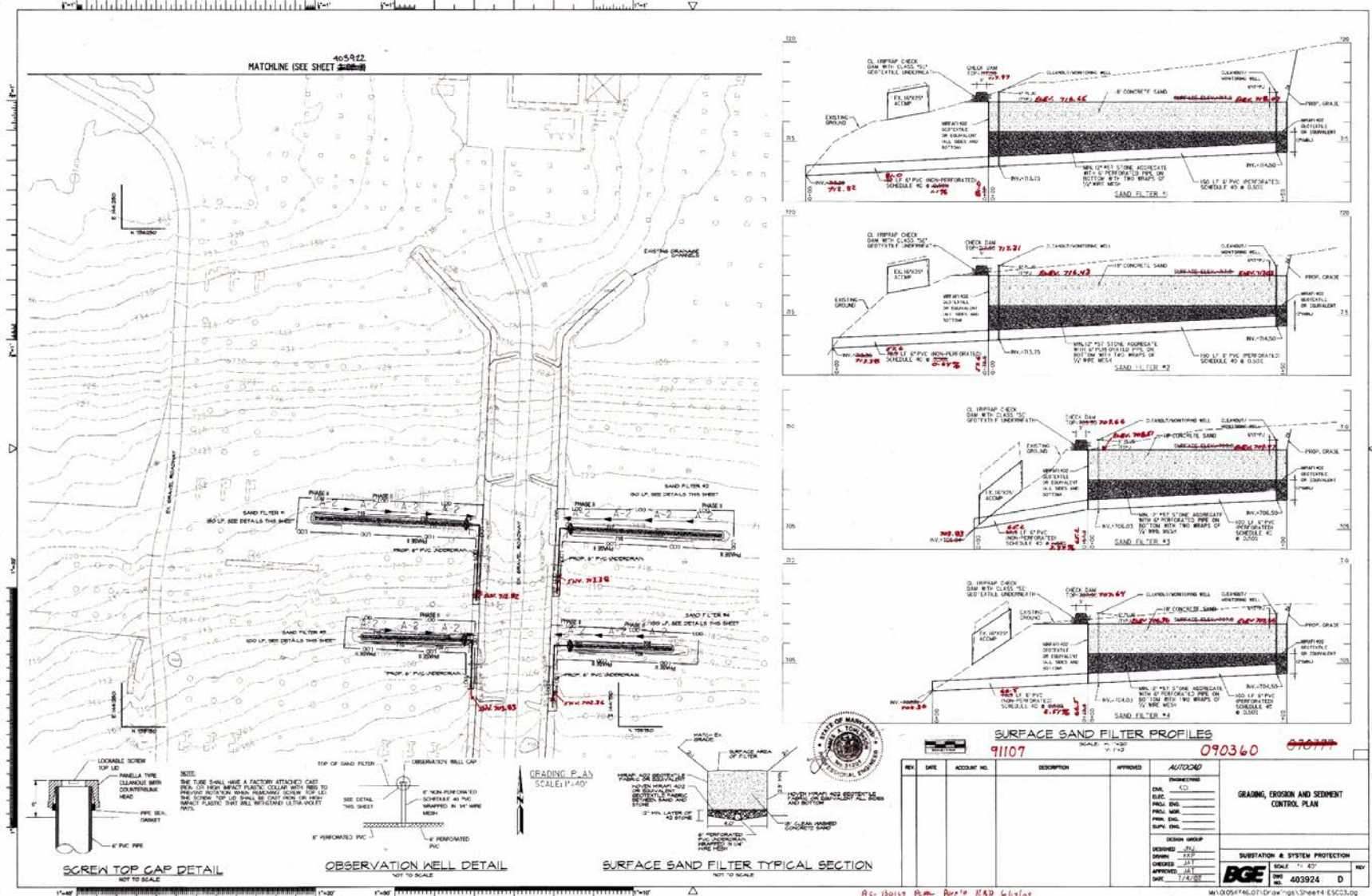
Asbuilt/Design
Plans

56% of all SWM
20% not completed
16% not required
8% in progress

Maintenance
Agreements

40% of all SWM
46% not completed
7% not required
7% in progress

Sample Asbuilt Plan



SWM Facility Inventory : Phase 2 Analysis

Strengths & Weaknesses

The Good...



SWM Facility Inventory : Phase 2 Analysis

Strengths & Weaknesses

The Good...



SWM Facility Inventory : Phase 2 Analysis

Strengths & Weaknesses

The Good...



SWM Facility Inventory : Phase 2 Analysis

Strengths & Weaknesses

The Bad...



SWM Facility Inventory : Phase 2 Analysis

Strengths & Weaknesses

Strengths

- Responded quickly
- Maintenance good
- No compliance issues

Weaknesses

- Construction process
- Lack of clear responsibility
- Reactive vs. Proactive
- Funding
- Clarity
- Adaptability

External Factors - Variability

- County funding
- Inspection notices
- Maintenance requirements
- County permitting

SWM Facility Inventory : Phase 3 Closeout - Enhancements

Recommendations

1. Improve construction close-out procedures (PMs)

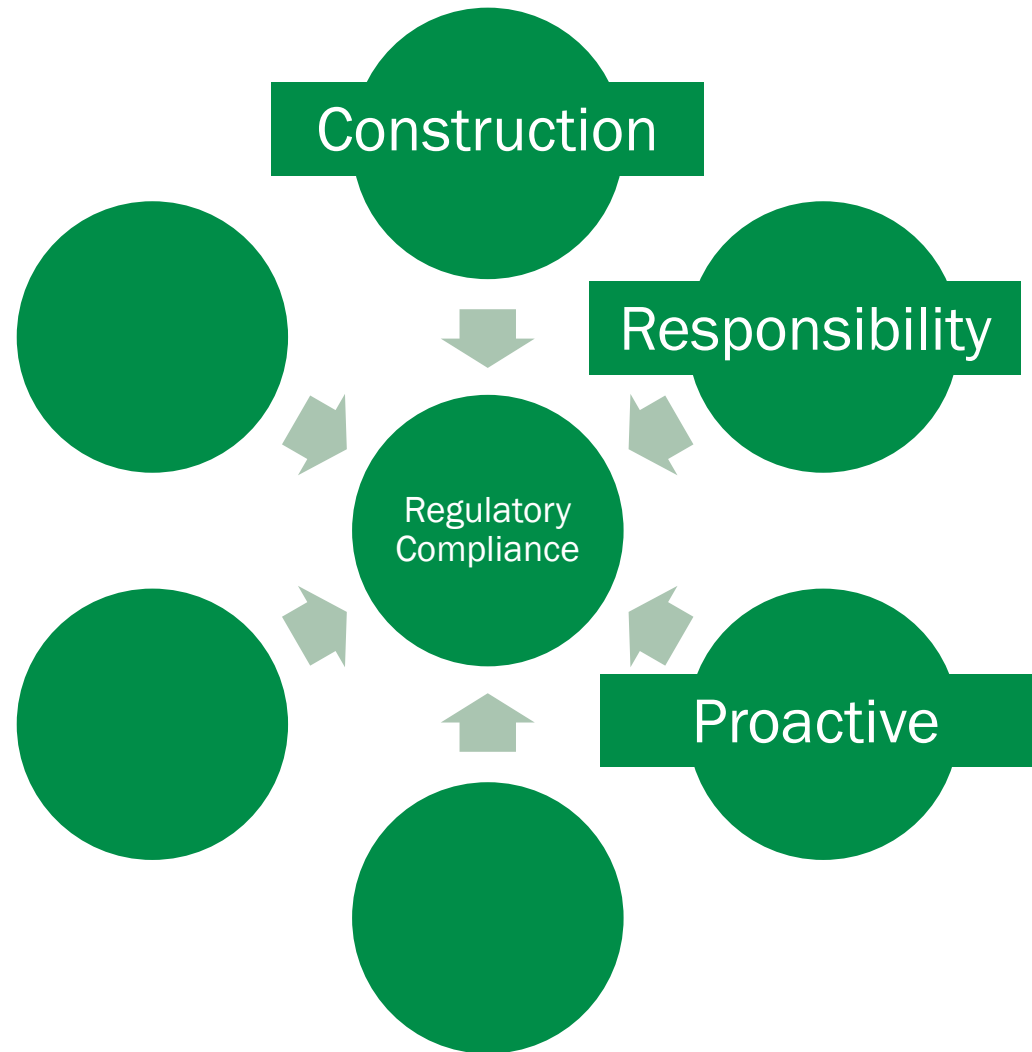
- A. Walkdown checklist
- B. Engineer & Geotech certifications
- C. SWM Facility asbuilt plans
- D. Transition meeting
- E. Dedicated personnel

2. Clearly define M & I responsibility

- A. Transmission & Substations (87%)
- B. Property Management (13%)

3. Be proactive

- A. Baseline condition assessments
- B. Track inspections, issues, trends
- C. Develop inspection checklist(s)
- D. Add SWM to regular facility inspections



SWM Facility Inventory : Phase 3 Closeout - Enhancements

Recommendations

4. Adequate budgets and planning

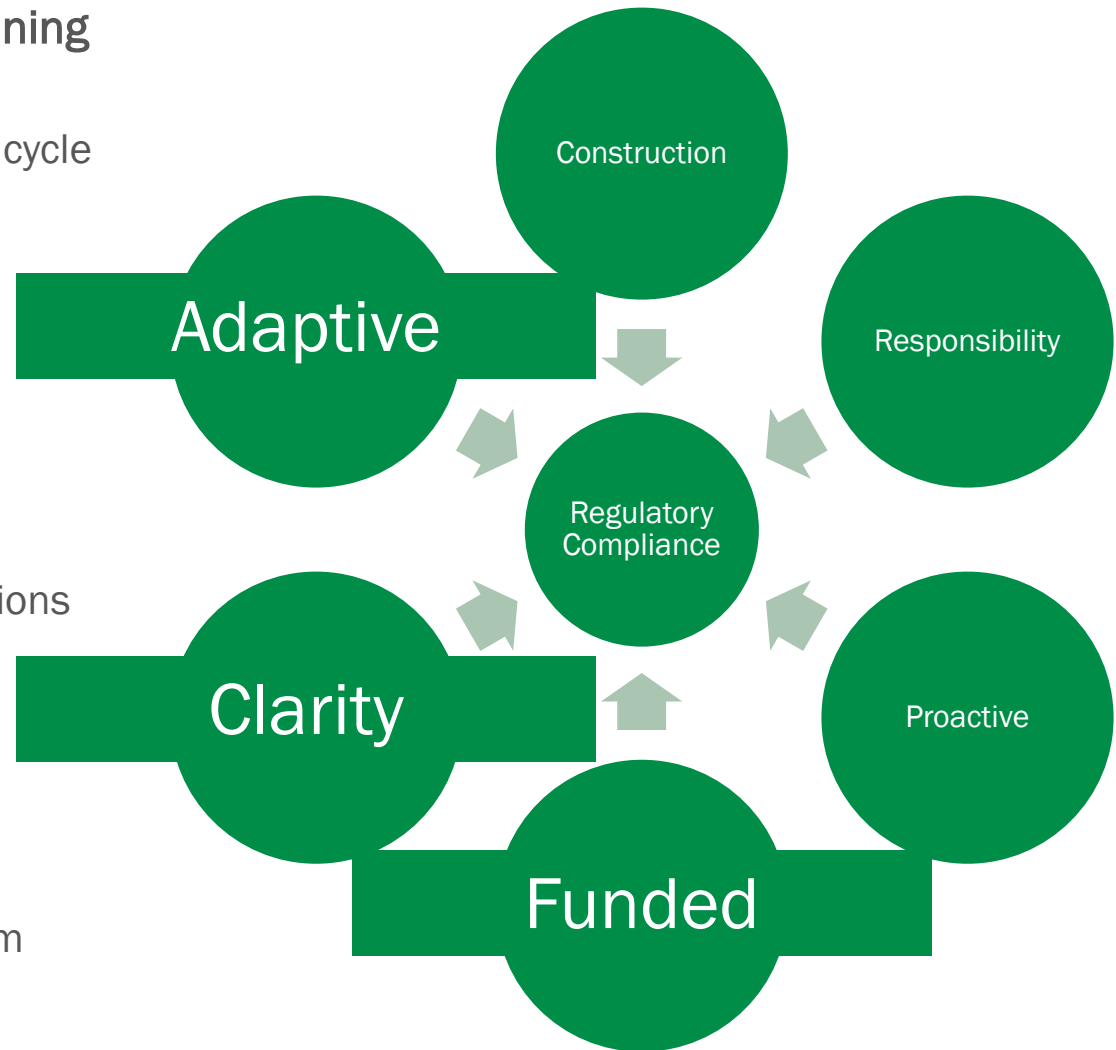
- A. Look back for trends
- B. Inspection & maintenance cycle
- C. Find \$\$\$

5. Clearly defined M & I requirements

- A. Inspection Checklists
- B. Minimum standards
- C. Certainty in starting conditions

6. Adaptive

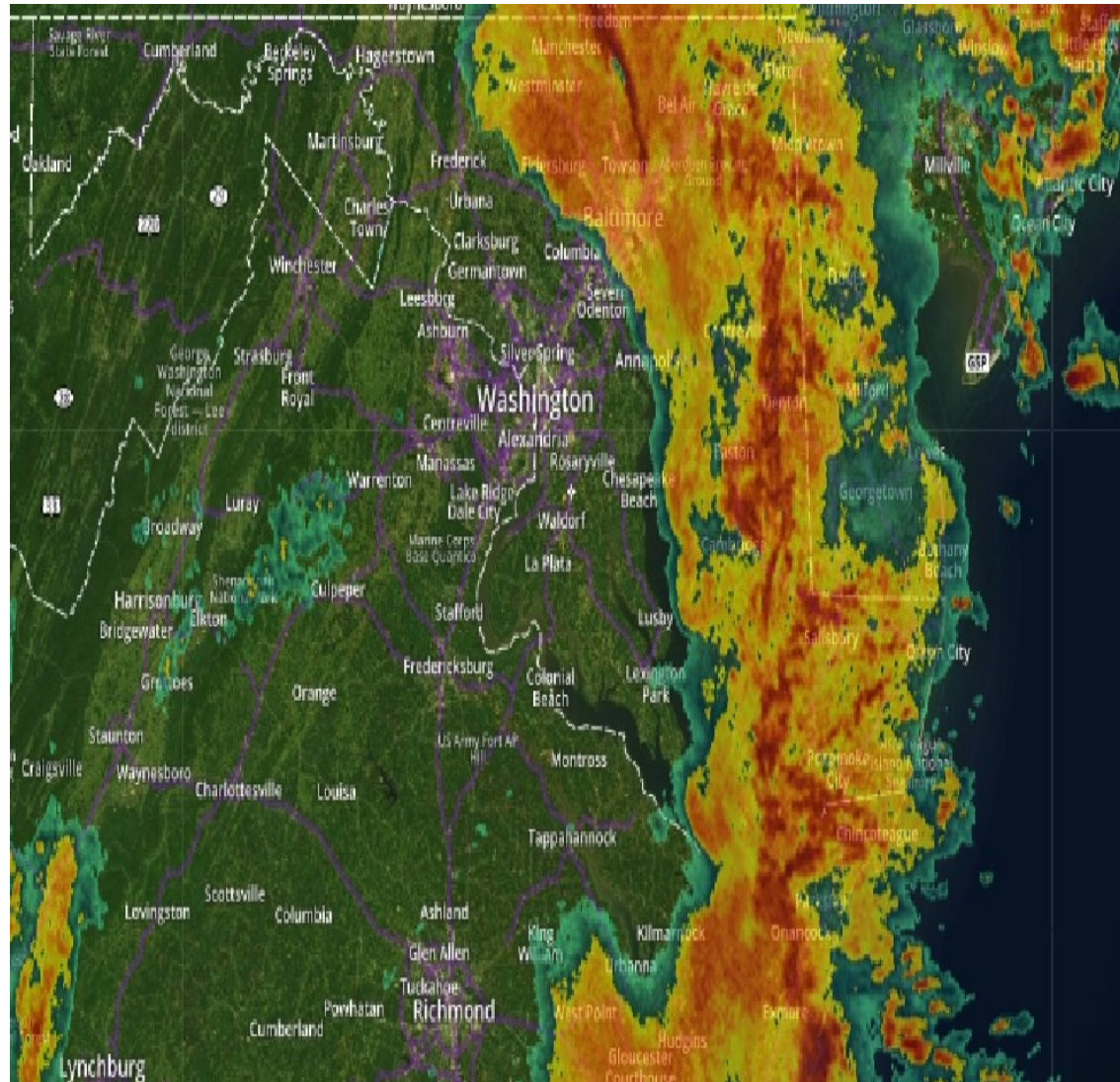
- A. Training
- B. New technology
- C. Review and update program



SWM Facility Inventory : Phase 3 Closeout – Future Planning

What does the future hold?

1. More facilities...not less
2. BGE pays for inspections & certifications
3. More with less \$\$\$
4. Extreme weather events



SWM Facility Inventory : Phase 3 Closeout – Communication

1. Designate main points of contact

2. Access to Sharepoint



Search Help Apps

Dashboard

Folders

Personal Folders

Shared Folders

Favorites

File Box

Recycle Bin

Inbox

People

Personal Settings

Personal Folders > SWM Asbuilt Plans

SWM Asbuilt Plans

More Options

Items in this Folder

People on this Folder

<input type="checkbox"/>	Name ▲	Size	Uploaded	Creator	
<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> Asbuilt info for L Filbert	715 MB	2/28/19	K. Hedge	
<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> Non-Substation Fac	284 MB	6/24/19	K. Hedge	
<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> Substations	2 GB	6/24/19	K. Hedge	
<input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> Transmission Facilities	609 MB	6/24/19	K. Hedge	

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What did we learn?

1. Missing asbuilt (and design) plans

2. Living up to commitments

3. Follow through has been poor

4. Data storage

5. Facilities

6. Staff turn-over

OWNER'S/APPLICANT'S CERTIFICATION

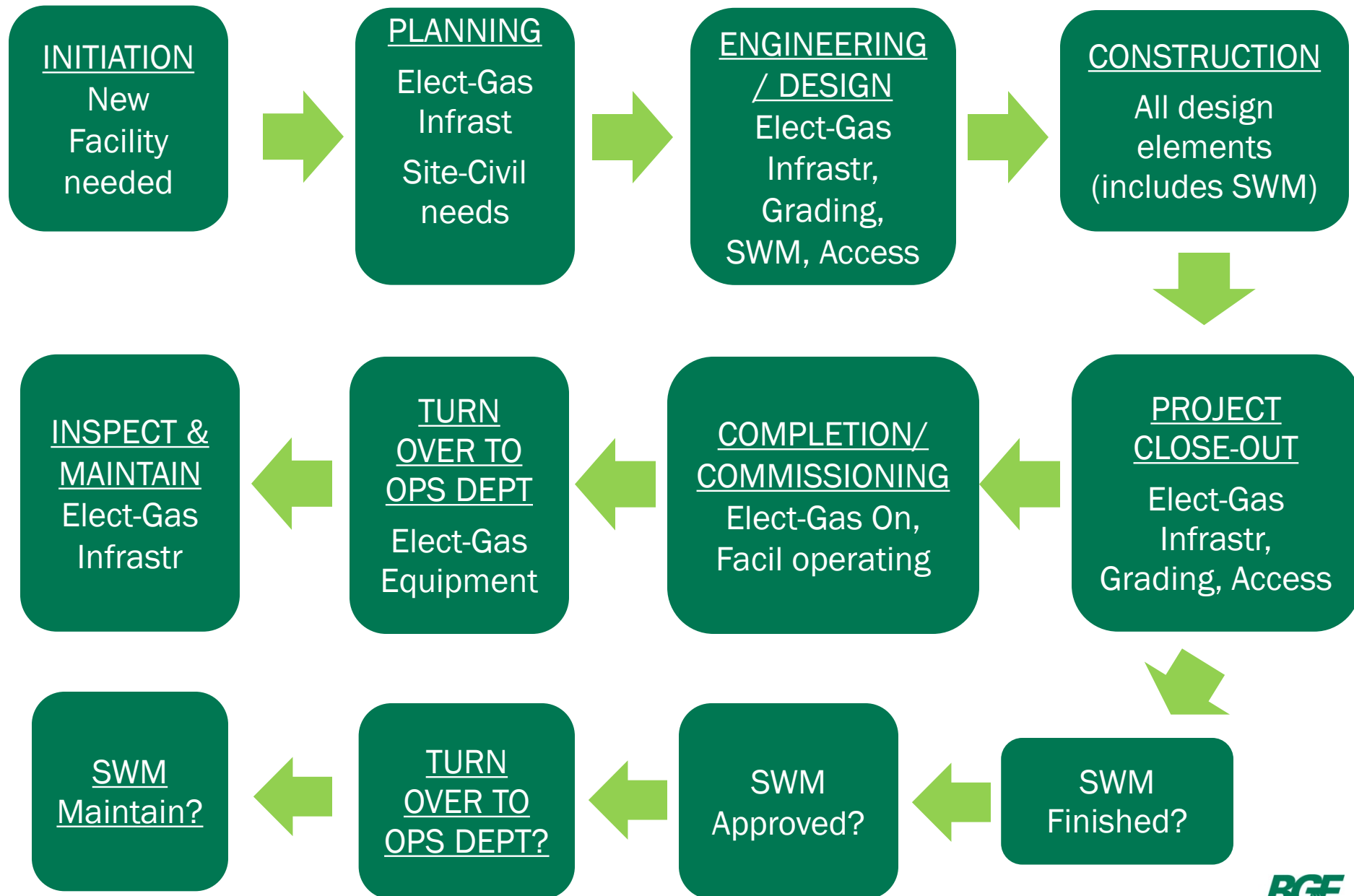
"I/WE CERTIFY THAT ALL DEVELOPMENT AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN OF DEVELOPMENT AND PLAN FOR EROSION AND SEDIMENT CONTROL. ALL RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE FROM A DEPARTMENT OF NATURAL RESOURCES APPROVED TRAINING PROGRAM FOR THE CONTROL OF SEDIMENT AND EROSION BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTIONS BY THE HARFORD SOIL CONSERVATION DISTRICT OR THEIR AUTHORIZED AGENTS, AS ARE DEEMED NECESSARY."

SIGNATURE:

David B. Hoop

DATE: 5-14-07

Lesson Learned - Current BGE Project Construction Process

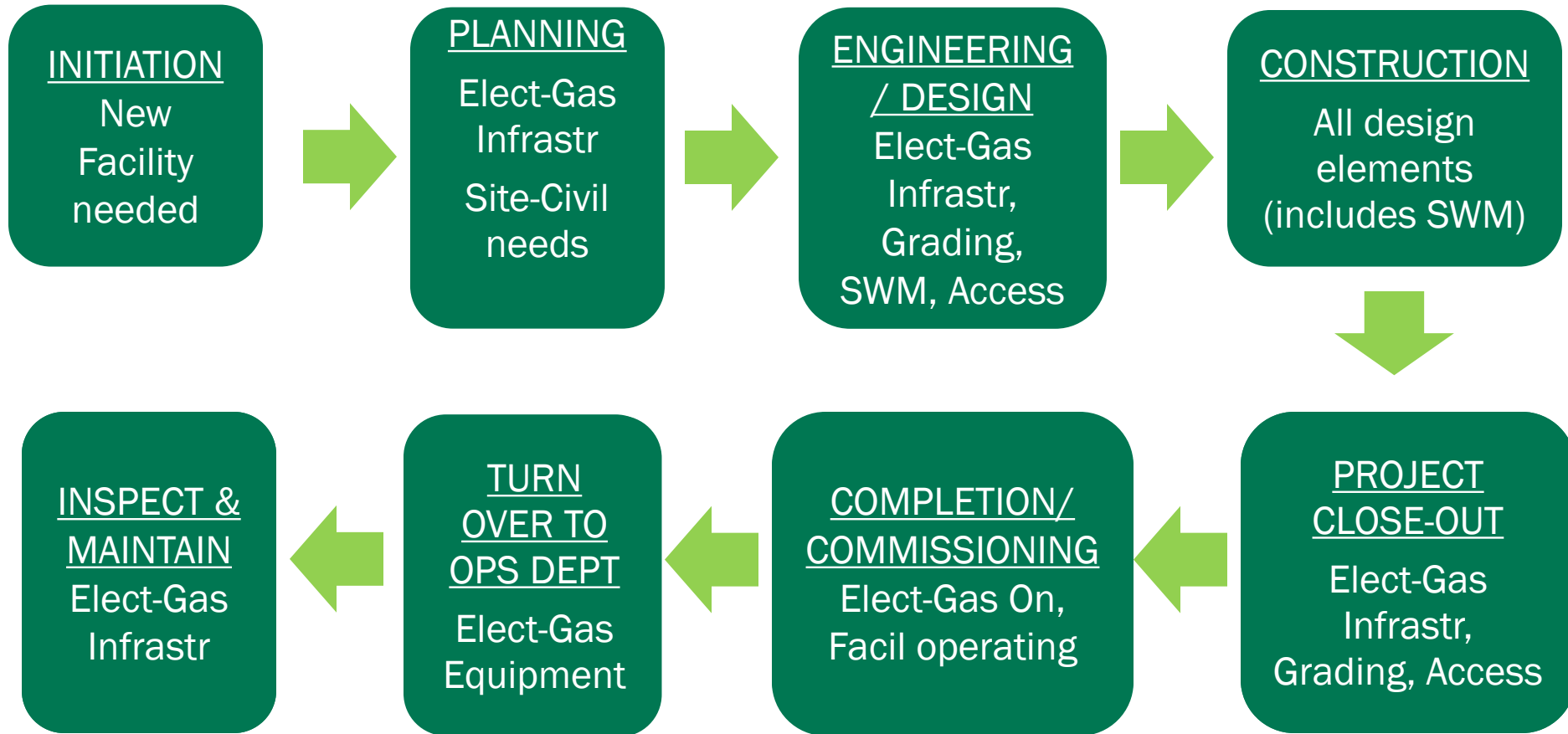


What can we do better?

1. Construction procedures
2. Project Management Responsibilities
3. Project close-out procedures
4. Permit tracking database
5. Inspection letter procedure
6. Tracking of inspections



Opportunities for Improvement – Optimal Construction Process



Getting it right!

What do we do next?

1. Establish interdepartmental work group
2. Checklists and baseline assessments
3. Educate PMs on close-out procedure
4. Outreach to Counties for letters
5. Review internal policy and procedures
6. Regular review of facilities and procedures



Thank you!

