MAINTAINING THE BMP

SESSION OVERVIEW

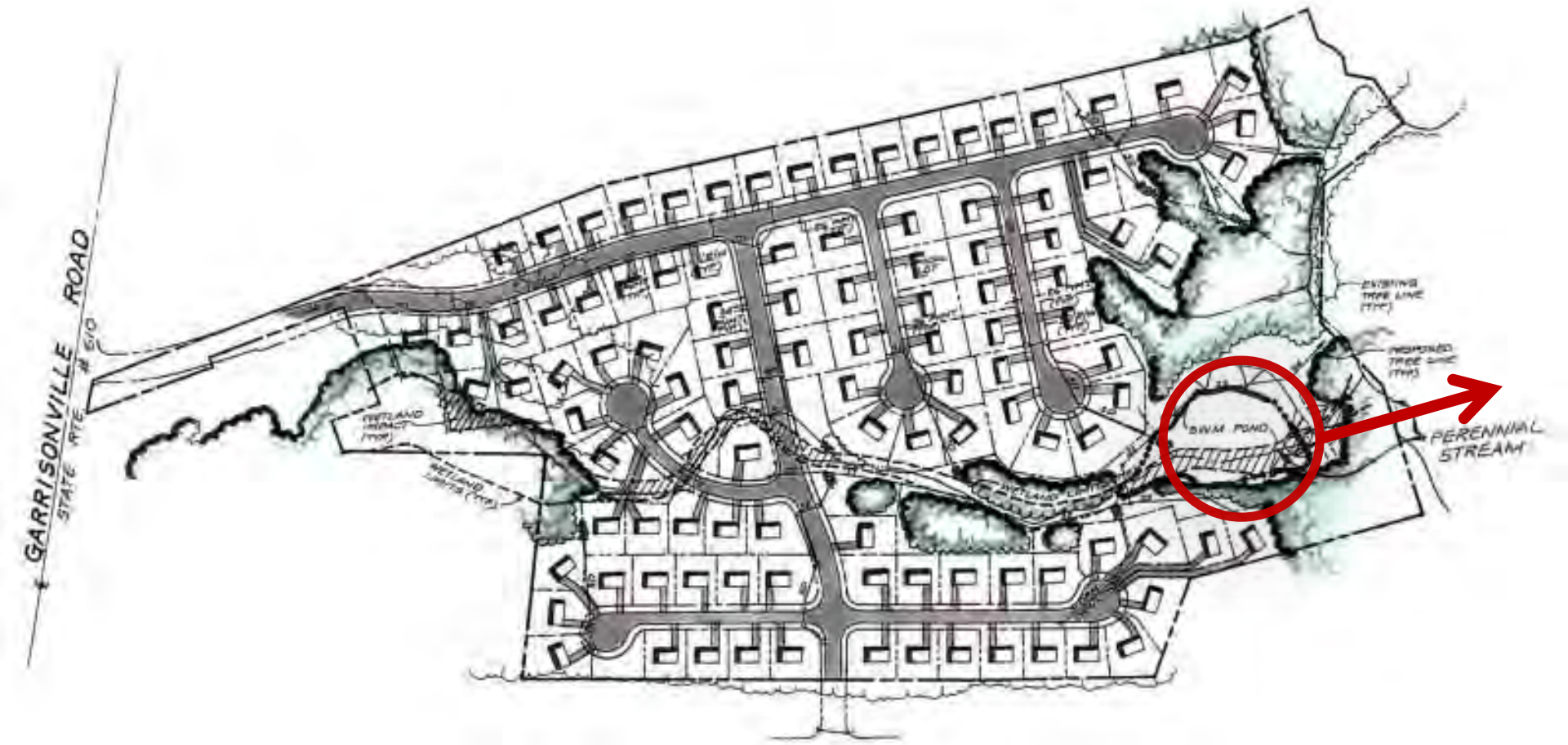
- TRANSITIONING TO THE "MANY BMP" MODEL
- MAINTENANCE ISSUES THAT ARE REALLY DESIGN ISSUES
- BMP MAINTENANCE FORENSICS
- MAINTENANCE PROGRAM TOOLS
- BMP PERFORMANCE VERIFICATION FOR BAY MODEL


Maintenance
Access Award!

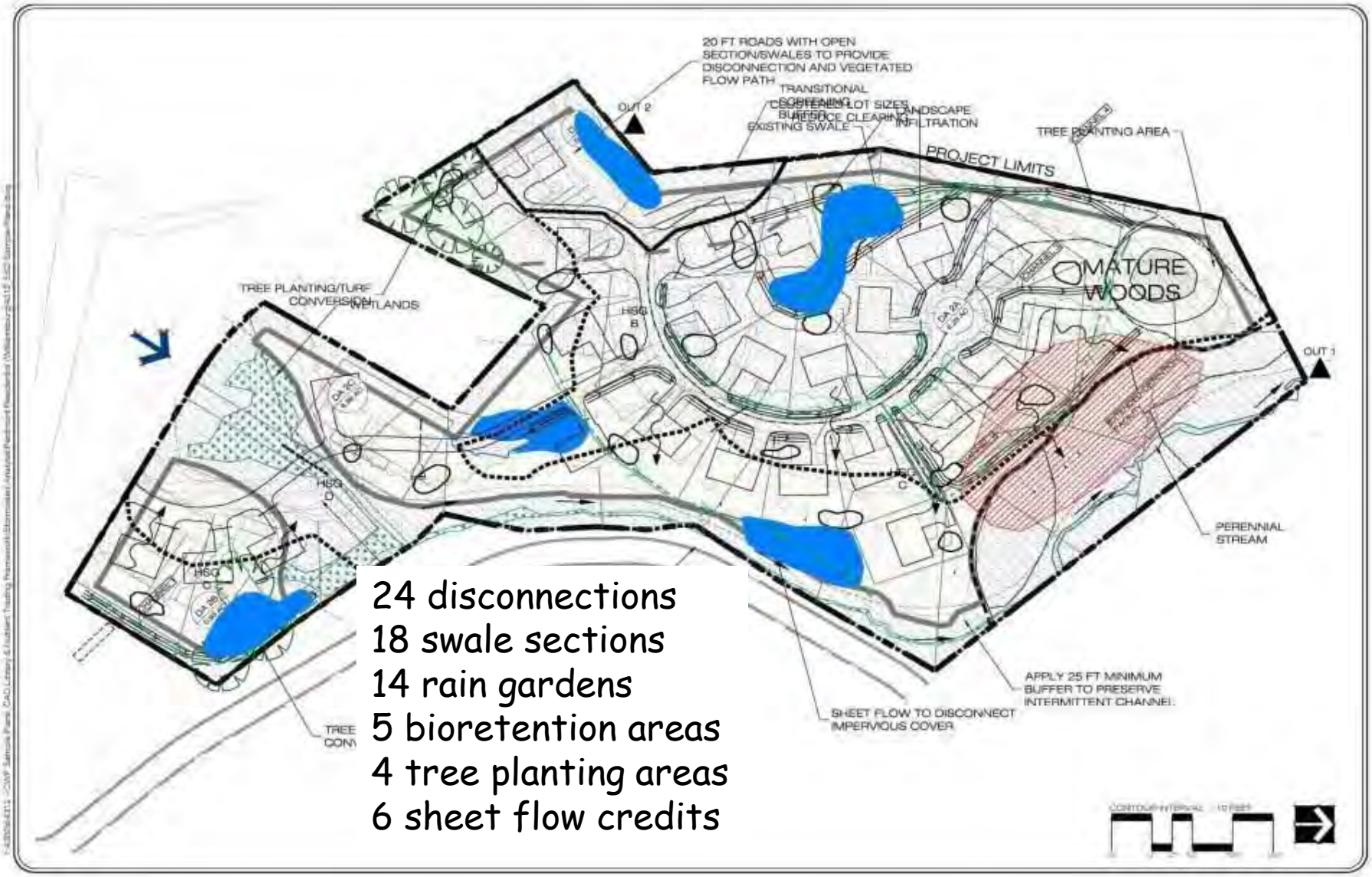

WATERWAY BUFFER ZONE
VEGETATION PROTECTED
BY COUNTY CODE
30 1:55PM

THE OLD POND MAINTENANCE MODEL

ONE BIG POND



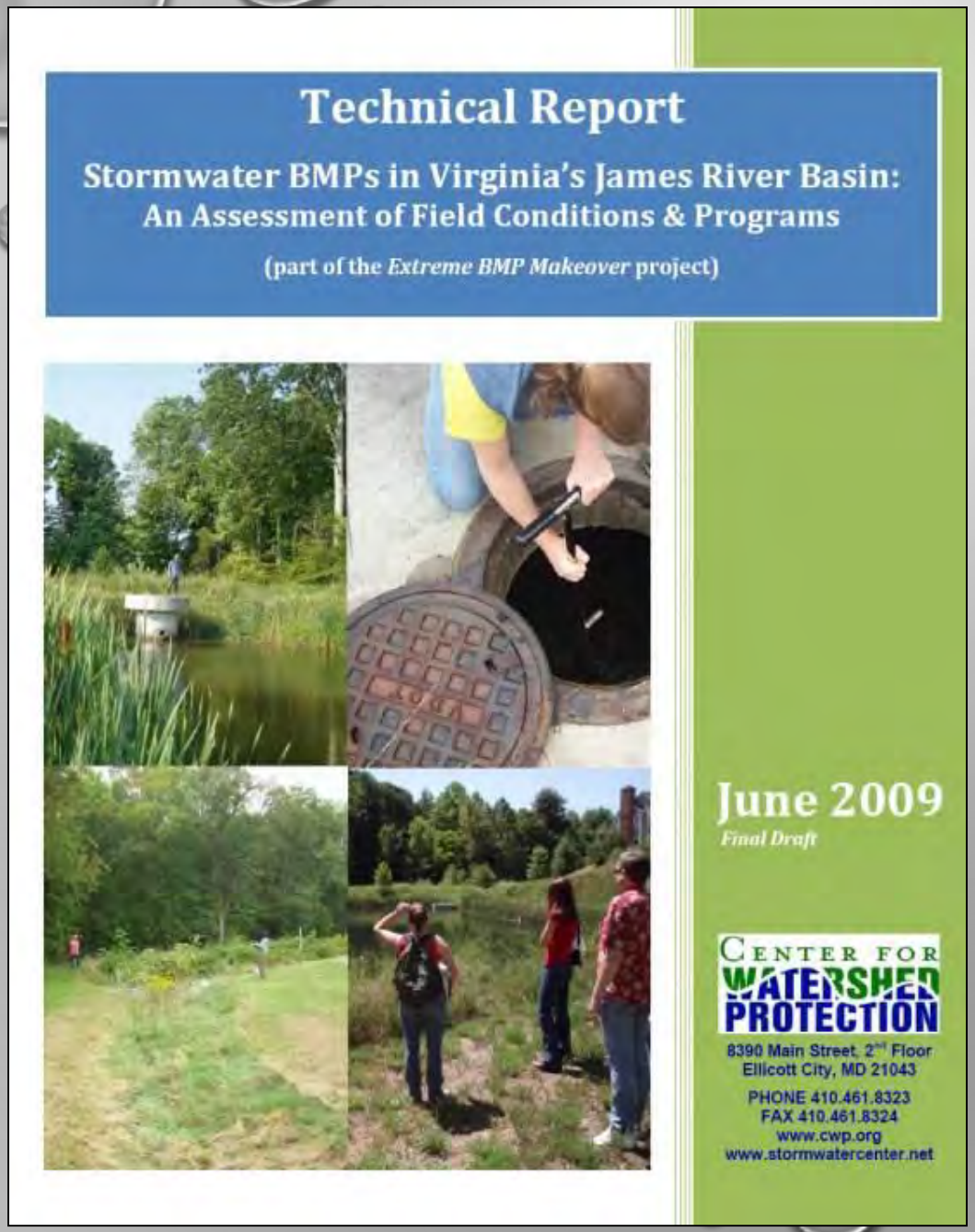
The New "Many-BMP" Maintenance Model



24 disconnections
18 swale sections
14 rain gardens
5 bioretention areas
4 tree planting areas
6 sheet flow credits

The Changing Maintenance Paradigm

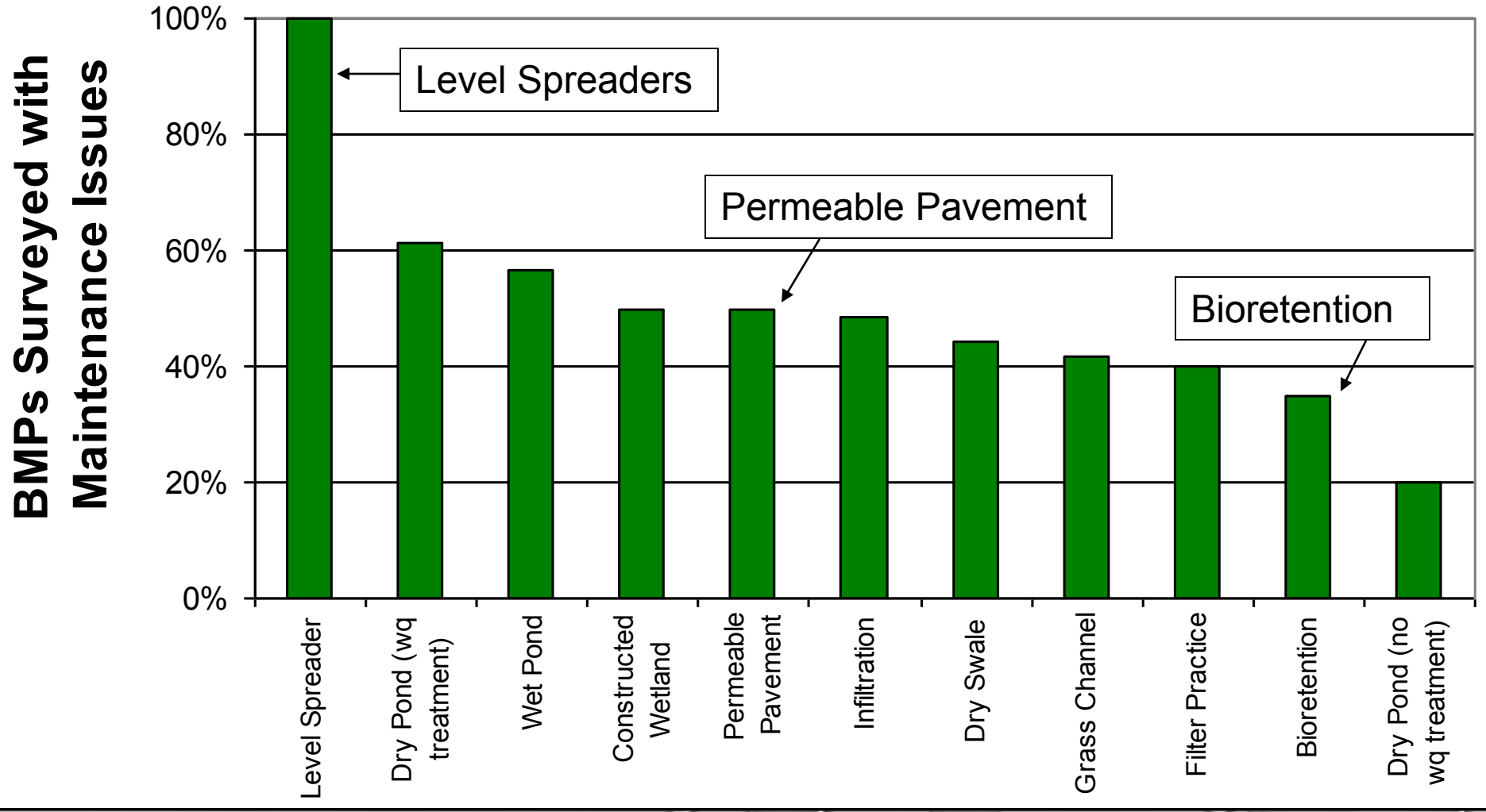
	Conventional Practices	LID Practices
Example of Practice	Pond	Disconnects/rain garden
Number of practices?	A few at each site	Dozens
Size of practices?	Large drainage area	Micro-drainage area
When to construct?	During site construction	After site is stabilized
Who is responsible?	Homeowner association	Homeowner
Who does inspection?	Public sector engineer	Trained contractor
Who does maintenance	Specialized contractor	Landscape contractor
How long does it take?	Hour or more	10 minutes
What is the goal?	Prevent dam failure and and public nuisances	Maintain hydrologic function and landscaping
Sediment cleanouts?	On a 30 to 50 year cycle (if ever)	Annual cleanouts at pretreatment devices
Maintenance Triggers	After catastrophic failure	When it looks like crap



- Design
- Installation
- Maintenance

Maintenance Issues

Percent of BMPs Surveyed with Maintenance Issues



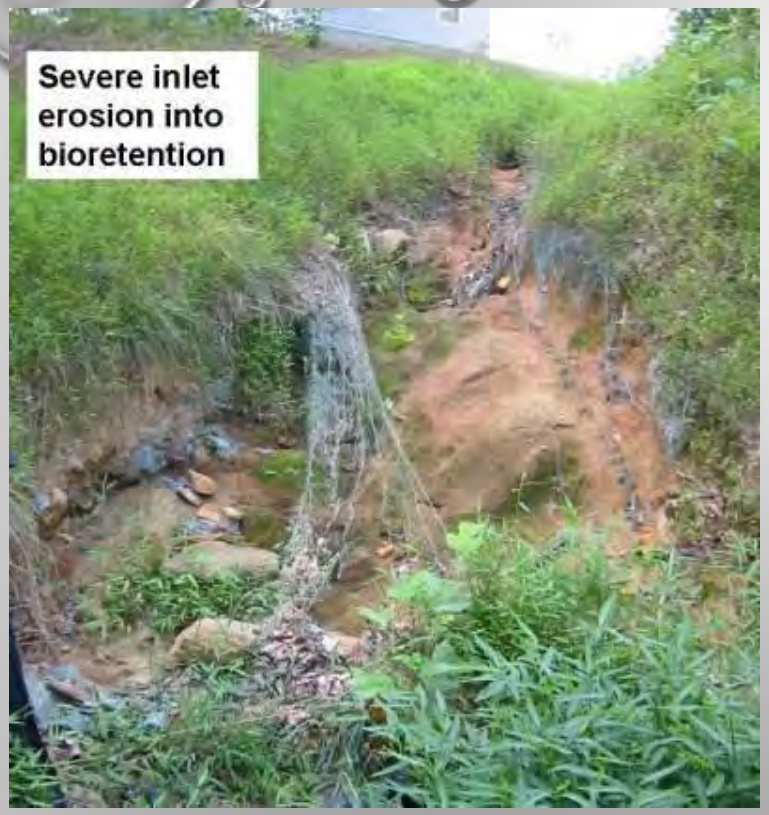
Sediment Deposition

Maintenance Access

Are YOUR inspectors this adventurous?

Difficult to Maintain

Erosion


Severe inlet erosion into bioretention


Wooded detention pond
Flow channelized through detention area


Poor maintenance of vegetation = bank erosion

Vegetation: Too much, too little – what's the intended palette?

Owner Awareness

What are some solutions?

CONSIDER MAINTENANCE DURING DESIGN

- PUT RISER NEAR EDGE OF POND
- MAINTENANCE ACCESS TO FOREBAY & RISER
- GENTLE SLOPE ON EMBANKMENTS
- RODS TO SHOW SEDIMENT ACCUMULATION
- PROTECT LOW-FLOW ORIFICE FROM CLOGGING
- VEGETATION MAINTENANCE PLAN & TARGET COMMUNITIES THROUGH TIME: 1-YEAR, 2-YEAR, 5-YEAR, 10-YEAR, ETC.
- INTEGRATE BMPS AESTHETICALLY WITH SITE AND "COMMON" USES

PLAN FOR SEDIMENTATION

- "OVERBUILD" FOR LOSS OF DEPTH OVER TIME
- PLAN FOR ACCUMULATION AT INLETS
- SEDIMENTATION RODS IN PRETREATMENT AREAS
- MAKE SEDIMENT REMOVAL SIMPLE

Good access to forebays for sediment removal

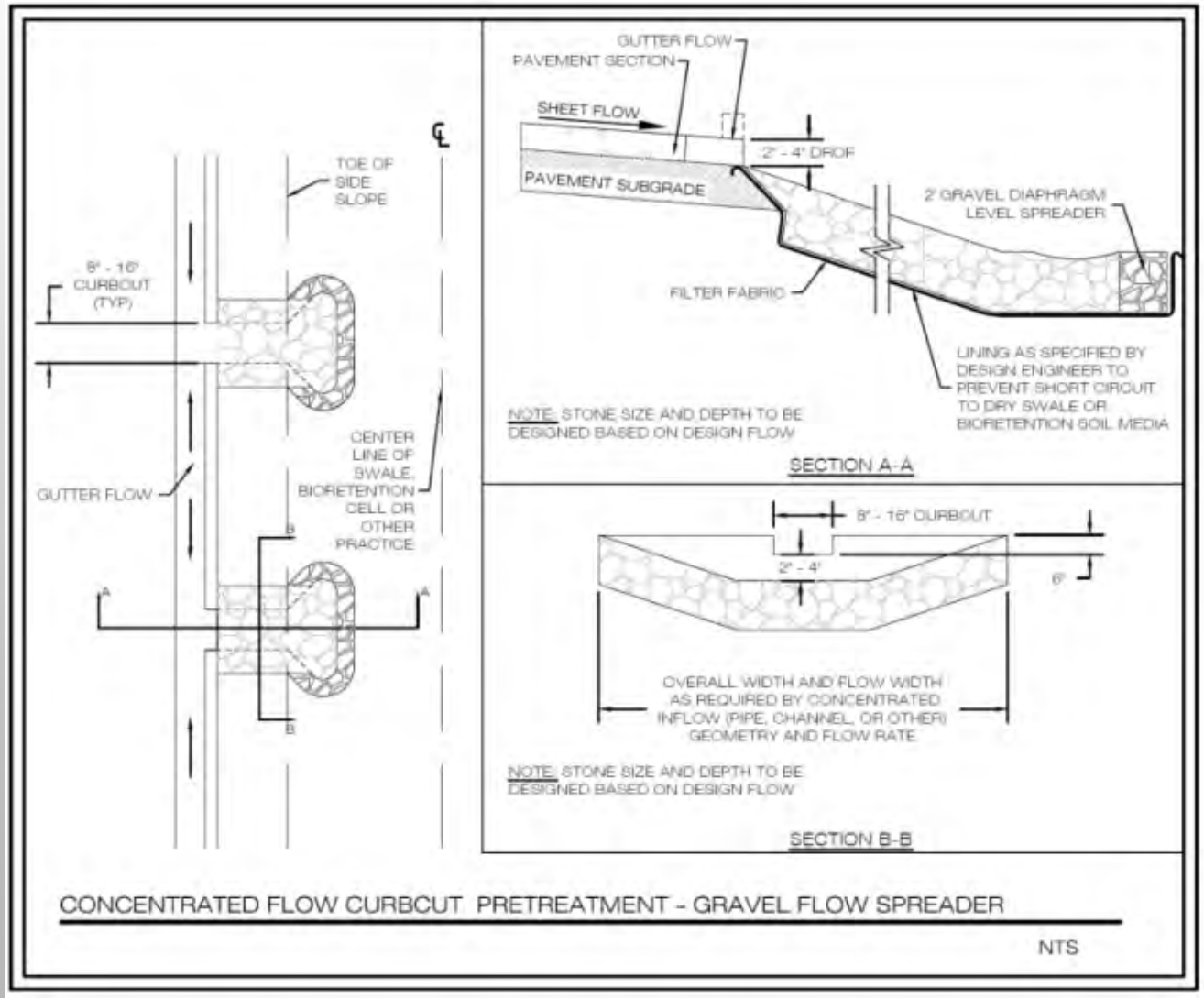
MAINTAINING ON-LOT PRACTICES

- Local program policies/alternative inspection schedule
- Role of lot owner vs. homeowners' assoc.
- Consider BMPs on-lot vs. in expanded right-of-way or drainage easement

YOUR TURN: BMP MAINTENANCE FORENSICS

HOW DOES MAINTENANCE RELATE TO DESIGN CHOICES?

PRE-TREATMENT DETAILS
(EXAMPLE: VA, CURB INLETS, CONCENTRATED FLOW)



VEGETATION OPTIONS

PERENNIAL GARDEN

TREE – TURF

PERENNIAL - SHRUB

TREE – SHRUB – MULCH

DYNAMIC VEGETATION MANAGEMENT

Year 1

Year 3

Year 10

SITE INTEGRATION


Soil Media
Pea Gravel Over
Underdrain Stone


08/27/2008

RUN-ON RATIO, PRE-TREATMENT

WHO IS RESPONSIBLE FOR MAINTENANCE? REGULATORY CONTEXT

- MS4 PERMIT:
  - PRIVATE: INSPECT EVERY 5 YEARS, POLICIES TO ENSURE MAINTENANCE, SCHEDULE, MAINTENANCE AGREEMENTS, ALTERNATIVE
  - PUBLIC: INSPECT ANNUALLY, CONDUCT MAINTENANCE
  - TRACKING & REPORTING
- VSMP:
  - LOCAL ORDINANCE, POLICIES & PROCEDURES, RECORDED INSTRUMENT FOR MAINTENANCE
- WIP/TMDL
  - VERIFICATION OF PERFORMANCE EVERY 9-10 YEARS

INSPECTION/MAINTENANCE PROGRAM TOOLS

- TB# 10 BIORETENTION ILLUSTRATED!
  - COMPLETE VISUAL INDICATORS FOR LID PRACTICES
- CONSTRUCTION, INSPECTION AND MAINTENANCE **VIDEOS** FOR LID PRACTICES ON CSN WEBSITE
  - IN ENGLISH AND SPANISH
- TABLET/SMARTPHONE APP THAT USES VISUAL INDICATORS TO RAPIDLY INSPECT AND DEVELOP MAINTENANCE PUNCH-LIST FOR EACH SITE

www.chesapeakestormwater.net

Chesapeake Bay Stormwater Training Partnership

Visit: www.chesapeakestormwater.net

To learn how you can have access to:

Discounted Webcasts

Free One-day design workshops

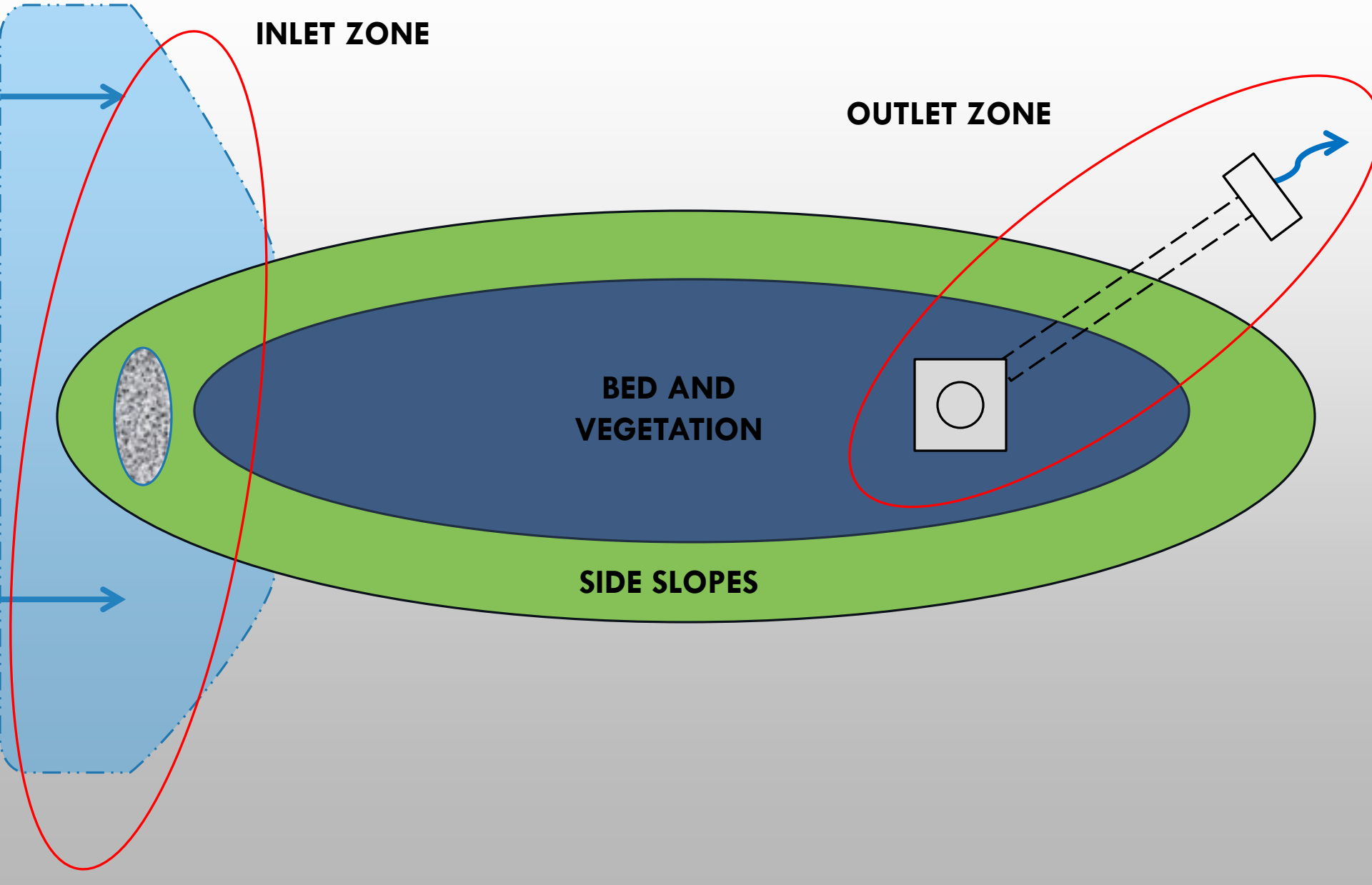
Intensive master stormwater design seminars

Direct On-site technical assistance

Self guided web-based learning modules

Bioretention Illustrated: Visual Indicator Approach for Inspection

Bioretention from above

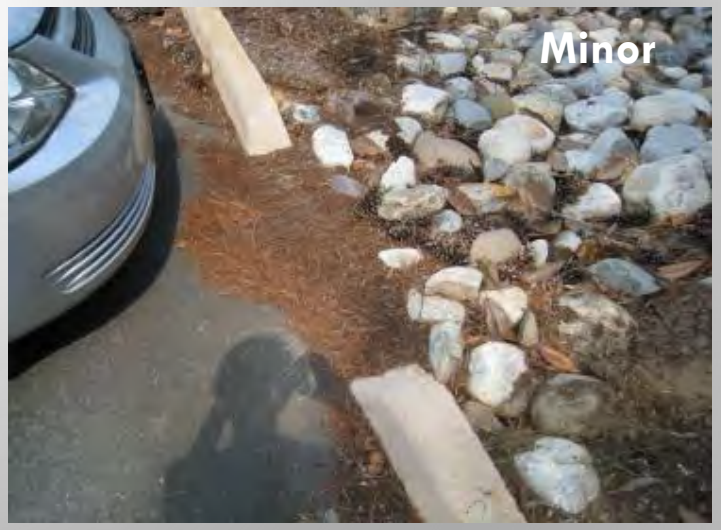


#1

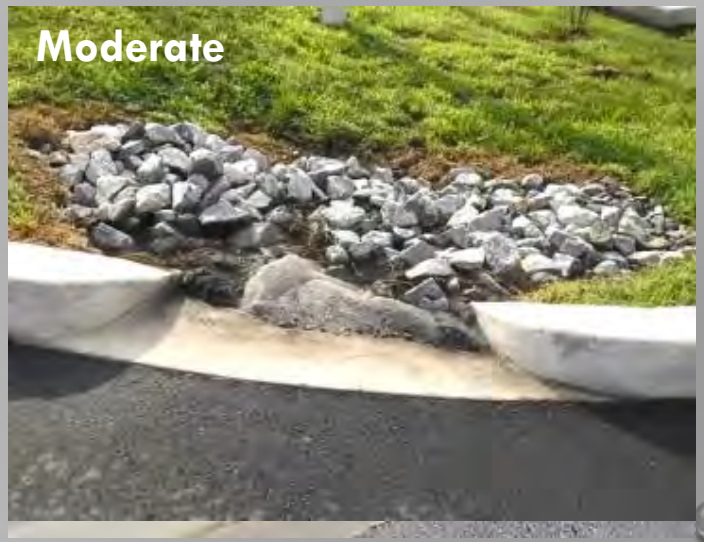
Inlet Obstruction

INLET ZONE

Good condition



Remove sediment, debris



Removal of sediment, obstruction

FBI

Sediment staining = entry problem

#10

Standing Water

BED ZONE

None

Saturated soils

<3" of standing water after 72 hrs

Proceed to pump down and test pit

#15

Vegetative Cover

VEGETATION ZONE

Good cover

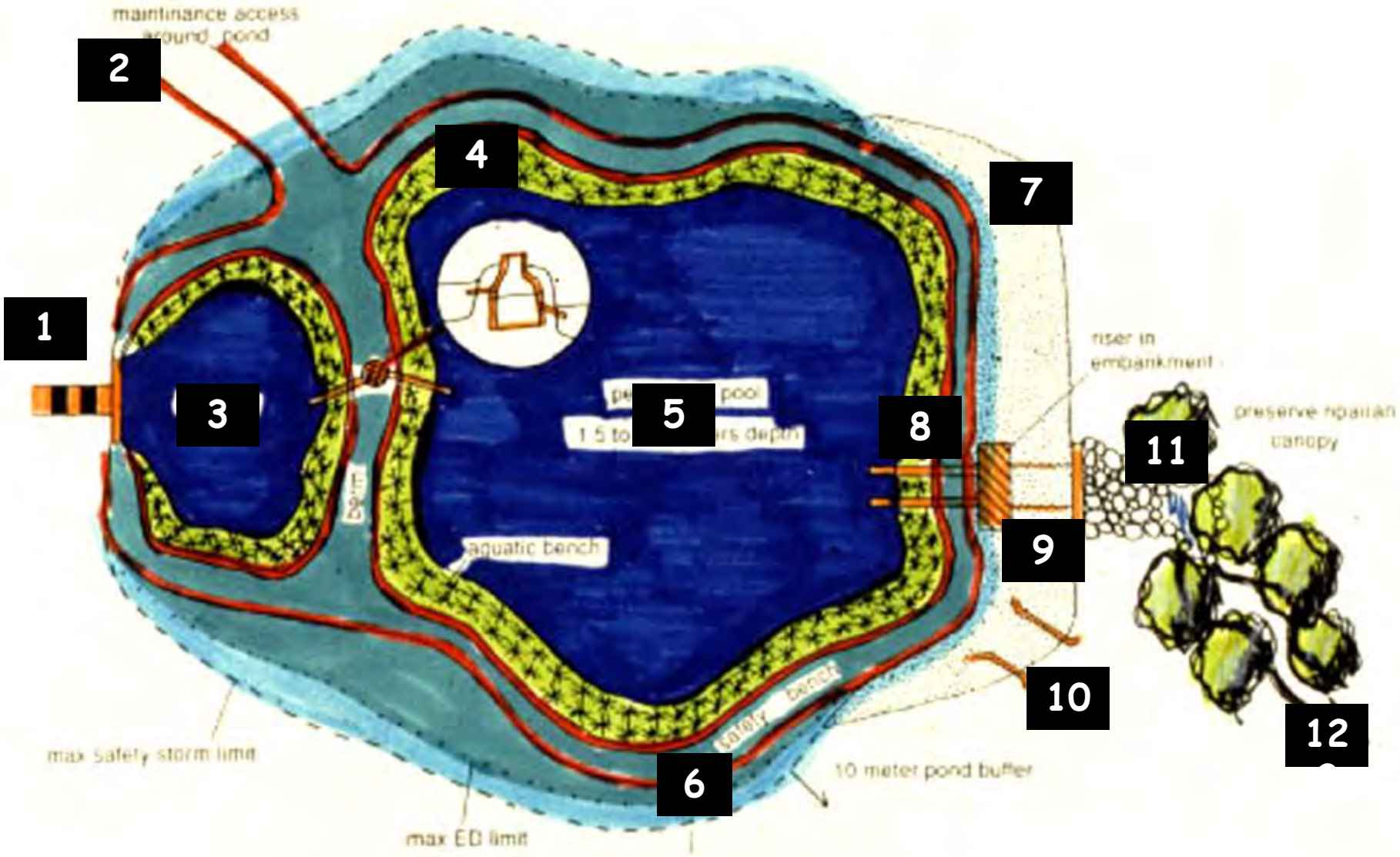
Few bare spots

Tip: more mulch area exposed = more maintenance cost

< 75% coverage

Tip: Routinely split and replant
Herbaceous material to reduce mulch area

Key Inspection Zones in a Stormwater Pond

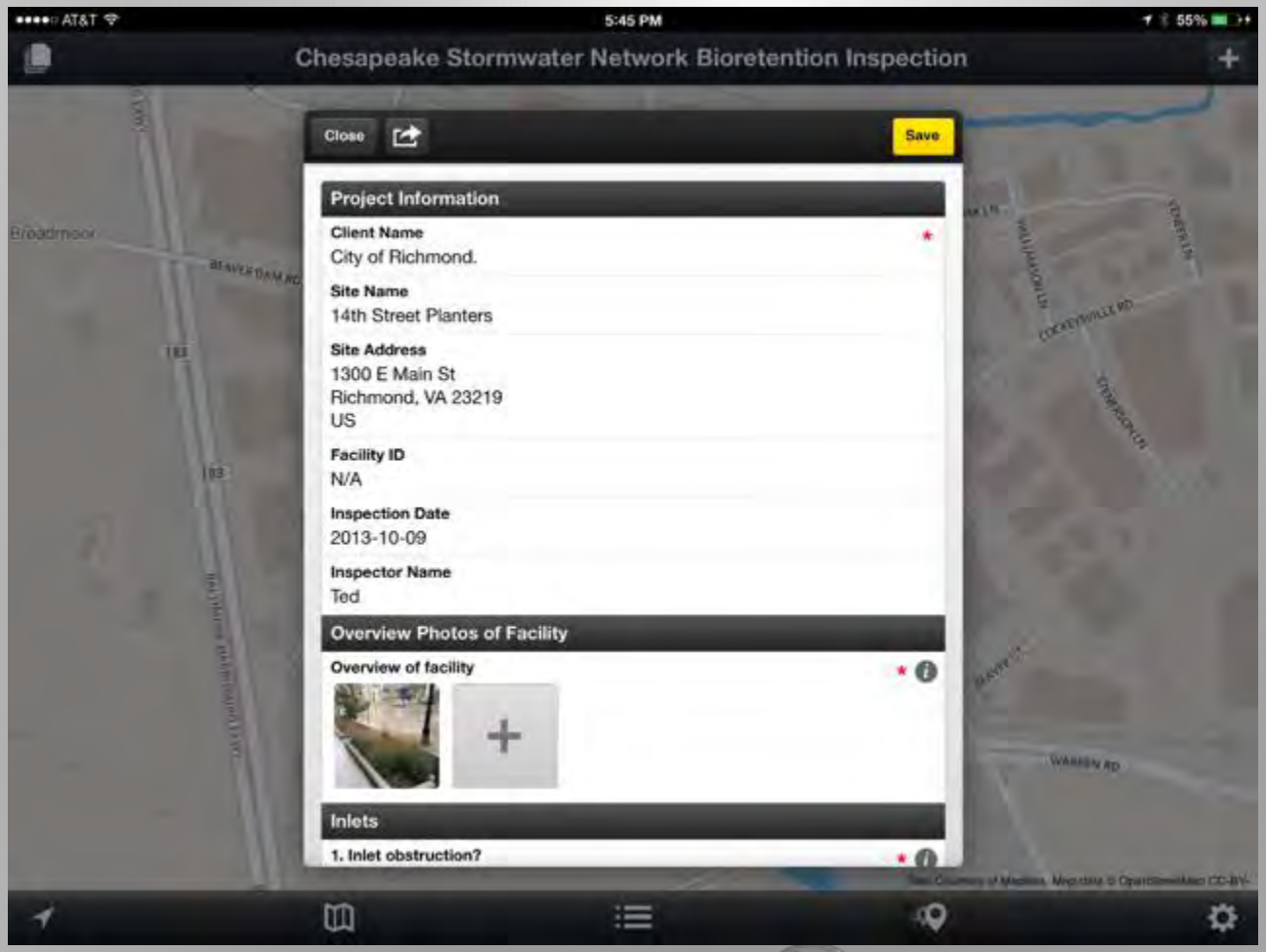


EQUIPMENT ACCESS

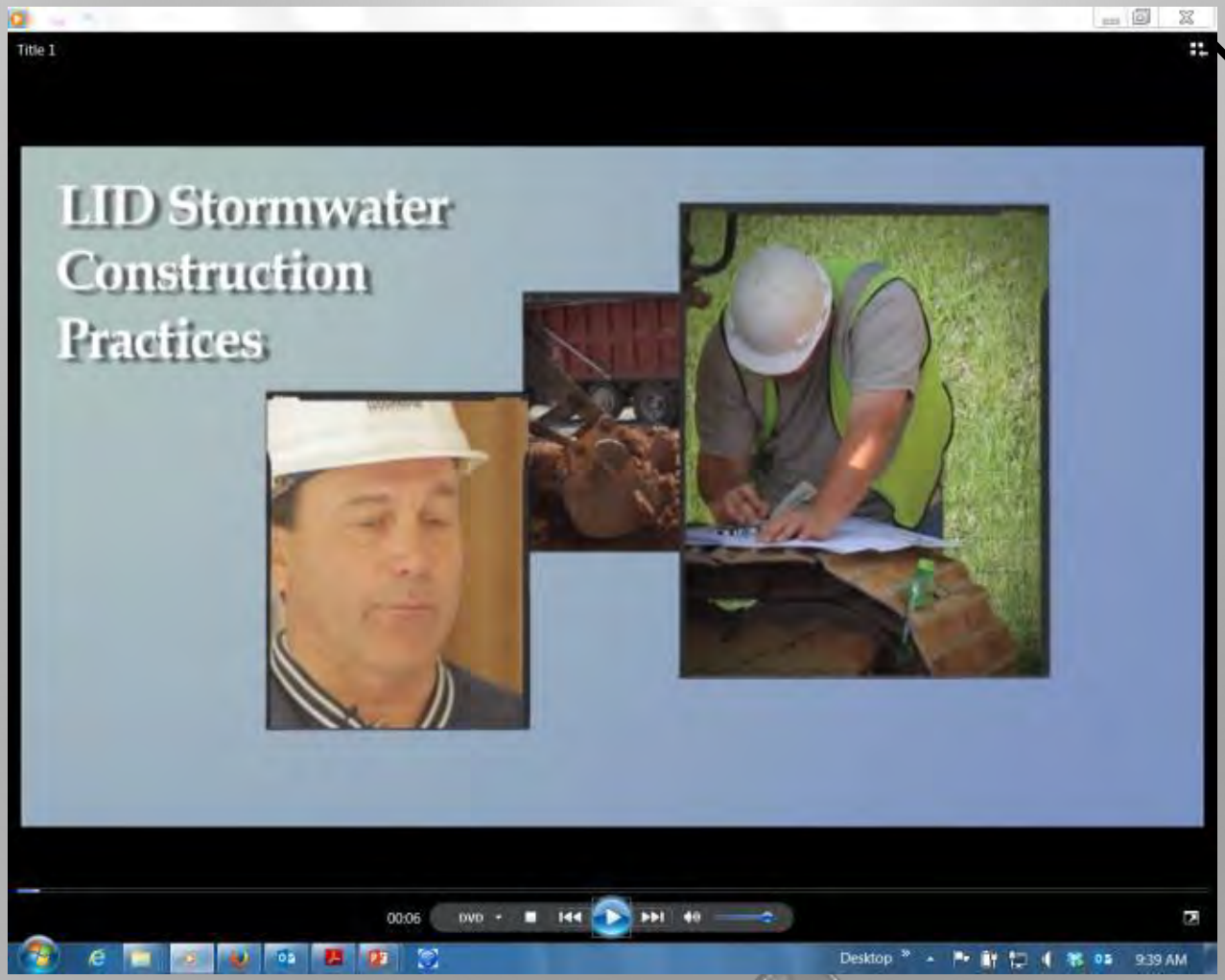
ABILITY TO GET ACCESS TO POND WITH HEAVY EQUIPMENT

- EASEMENT WIDTH
- VEGETATION GROWTH IN EASEMENT
- SLOPE
- FENCES
- LOCKS

INSPECTION APP: GIVE ME YOUR EMAIL



VIDEOS: INSTALLATION, MAINTENANCE



http://www.youtube.com/user/CenterforWatershed

THE BRAVE NEW WORLD OF BMP PERFORMANCE VERIFICATION

http://www.hsc.csu.edu.au/english/extension1/genre/elect3/3726/brave_new_world.htm

URBAN BMP VERIFICATION AND THE BAY POLLUTION DIET

- BMP VERIFICATION A PRIORITY FOR ALL SECTORS IN THE CHESAPEAKE BAY PROGRAM
- URBAN STORMWATER WORKGROUP ADOPTED ITS VERIFICATION PROTOCOL IN NOVEMBER 2012, REVISED IN JUNE 2013, MAY BE REVISED AGAIN
- STATES WILL IMPLEMENT THEM THRU THEIR EXISTING MS4 BMP REPORTING EFFORTS

Chesapeake Bay Program
A Watershed Partnership

Performance Verification

Ensure BMP still exists and is providing the pollutant removal it was designed to achieve or if it requires major restoration

MS-4 Permit/ Bay TMDL

Once every 9 -10 years

Trained evaluator

Local BMP Inventory

State BMP Reporting for Bay TMDL

THREE PART TEST: PASS/FAIL

1. DOES IT STILL PHYSICALLY EXIST ?
2. IS IT STILL OPERATING TO TREAT AND REDUCE RUNOFF AS IT WAS ORIGINALLY DESIGNED ?
3. IS IT'S MAINTENANCE CONDITION SUFFICIENT TO STILL SUPPORT ITS POLLUTANT REDUCTION FUNCTIONS ?

SUMMARY

- MANY BMPS? HAVE A MAINTENANCE PLAN
- BMP DESIGN – USE MAINTENANCE REDUCTION FEATURES
- NEW SPECS – LOTS OF DETAILS, E.G. PRETREATMENT
- STRATEGIC APPROACH FOR VEGETATION
- AVAILABLE MAINTENANCE PROGRAM TOOLS