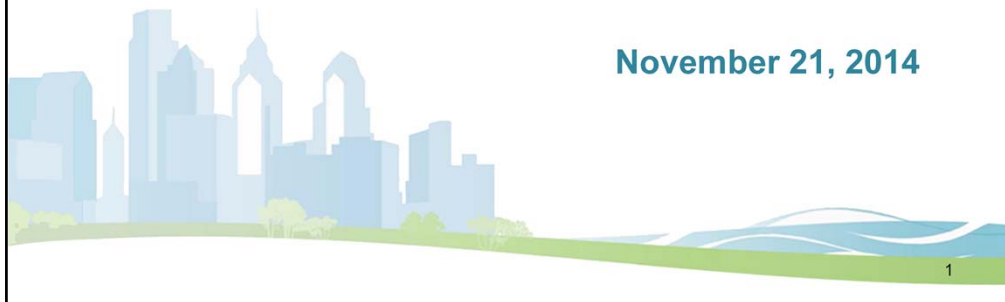


**PHILADELPHIA WATER DEPARTMENT**

**DEVELOPMENT SERVICES  
COMMITTEE MEETING**

November 21, 2014

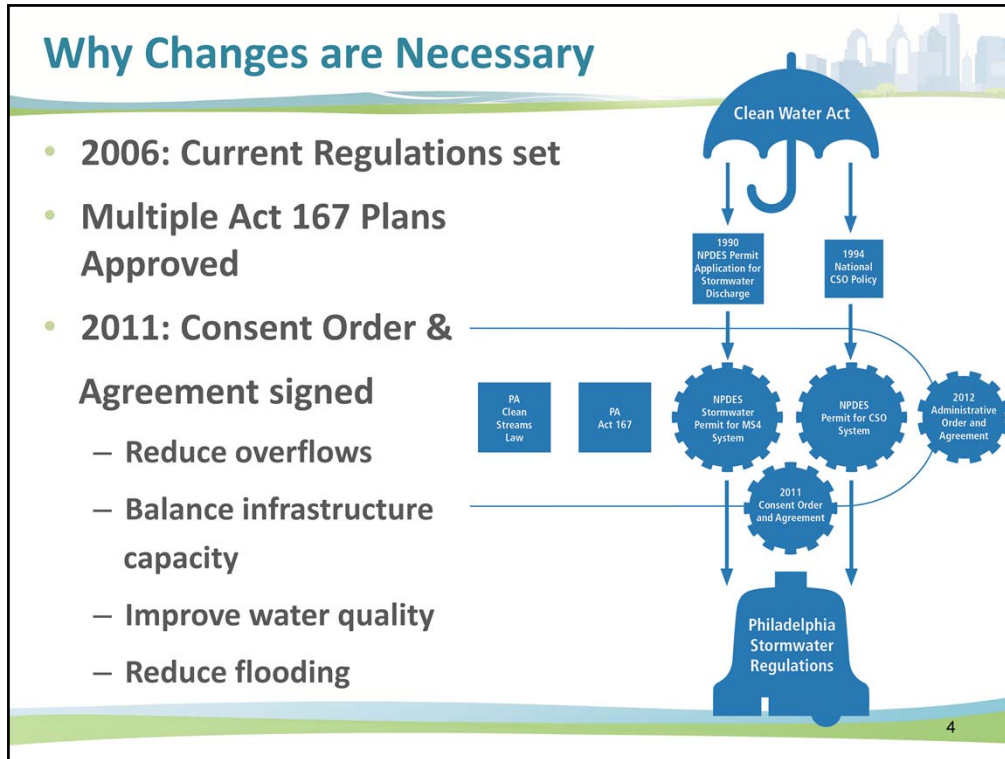


## Agenda

- Welcome
- July 2015 Regulation Update
  - Technical Changes
  - Procedural Changes
  - Outreach
- Stormwater Pioneers
- Closing

## July 2015 Technical Changes

- Why do the Regulations need to change?
- What are the proposed changes?
- Scope of technical analysis
- Summary of findings
- Evaluation of results
- Case study
- July 2015 Regulations



PWD is regulated by federal and state agencies. Specifically, PWD was required to reduce the number of combined sewer overflows. The Long Term Control Plan (LTCP) was created to reduce the CSOs. In 2006, PWD’s Stormwater Regulations were implemented to meet state and federal requirements in place at that time, including the standards of the LTCP. In 2011, after negotiations with the EPA and PADEP, PWD signed the Consent Order and Agreement (CO&A). This agreement was largely based on the LTCP update but it had some new requirements. These requirements are driving PWD’s new stormwater regulation changes. Additionally, some ACT 167 watershed plans were implemented for the Poquessing Creek and Pennypack Creek.

### Proposed Regulatory Changes


- **Earth Disturbance Threshold**
  - 15,000 ft<sup>2</sup> to 5,000 ft<sup>2</sup>
- **Water Quality Volume**
  - 1.0" to 1.5"
- **Maximum Release Rate Requirement**
  - 0.24cfs to 0.05cfs per acre-DCIA
- **Routing through Pollutant Reducing Practices**
  - 20% to 100%

5

In order to align PWD's Regulations with new Act 167 plans and the requirements of the CO&A, four regulation updates were proposed. The Act 167 plans required the reduction of earth disturbance threshold from 15,000sf to 5,000sf. The Water Quality Volume increase was proposed to meet the private Greened Acres target while the decreased maximum release rate was proposed based on the treatment rate of Philadelphia's Water Pollution Control Plants. Finally, the increased routing requirement through pollutant reducing practices was proposed to meet the mass capture requirement stipulated in the CO&A.

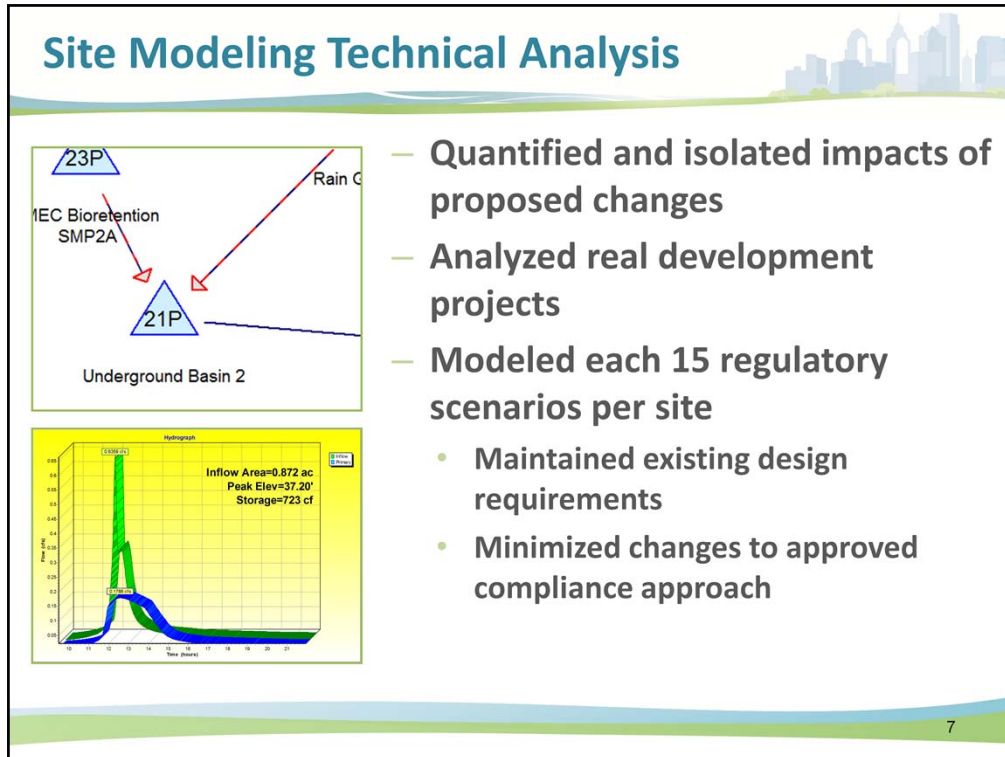
## Previous PWD Technical Analysis

- 5,000 ft<sup>2</sup> Threshold
  - Geospatial analysis of permit records
  - Identified who, where, and how many
- Status: **DELAYED**



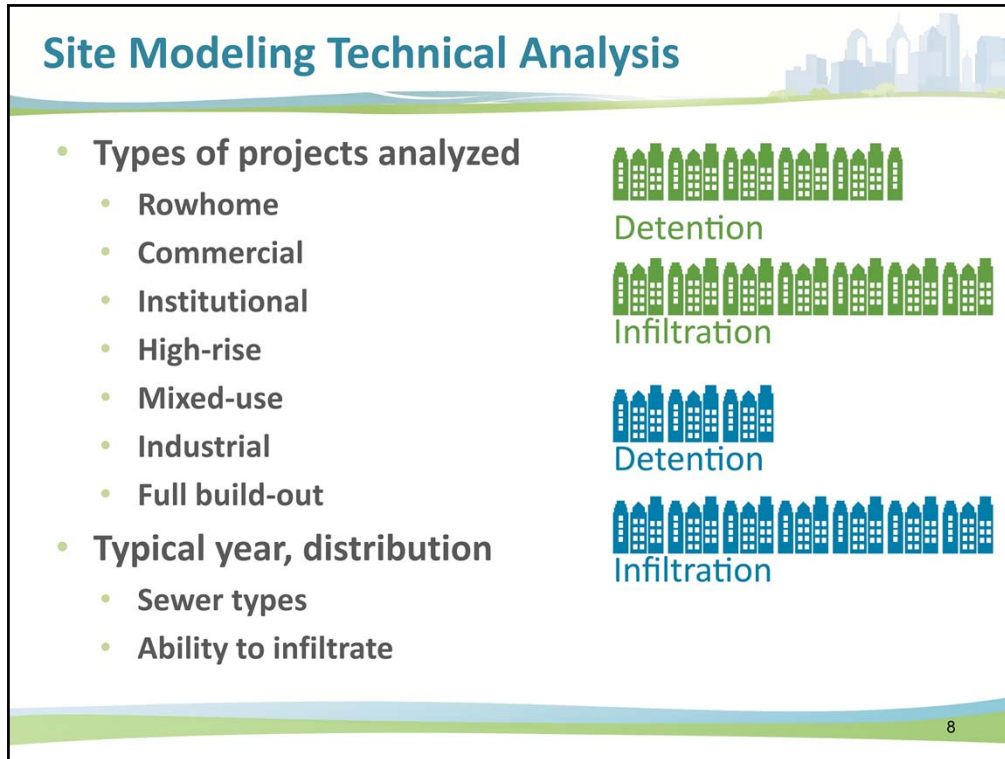
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As previously discussed with the Development Services Committee in 2014, PWD conducted a thorough analysis of L&I permit records to identify, evaluate, and better understand development projects that would be impacted by a reduced earth disturbance threshold to 5,000sf. The analysis looked at the size, location, frequency, and types of development projects disturbing 5,000-15,000sf in Philadelphia over the past 6 years. With this information, PWD determined it would need to delay the implementation of 5,000sf earth disturbance threshold until appropriate and effective compliance tools can be developed for this unique class of development projects.



Since our last Development Services Committee meeting, PWD has conducted a new technical analysis to better understand how the other proposed regulatory changes would influence development projects on a site level. PWD, with the support of a technical consulting contract, conducted a modeling study of 16 previously approved development projects to quantify and isolate the impacts of the proposed changes.

A key aspect of the analysis was ensuring that changes to the previously approved design and site layout were minimized while meeting the proposed regulations. Additionally, all existing design requirements and policies (e.g. 10:1 loading ratio) were maintained and disconnections, specifically green roof and porous pavement, were not used as compliance tools in this analysis. This methodology allowed PWD to narrow in on the specific effects of the regulation changes.

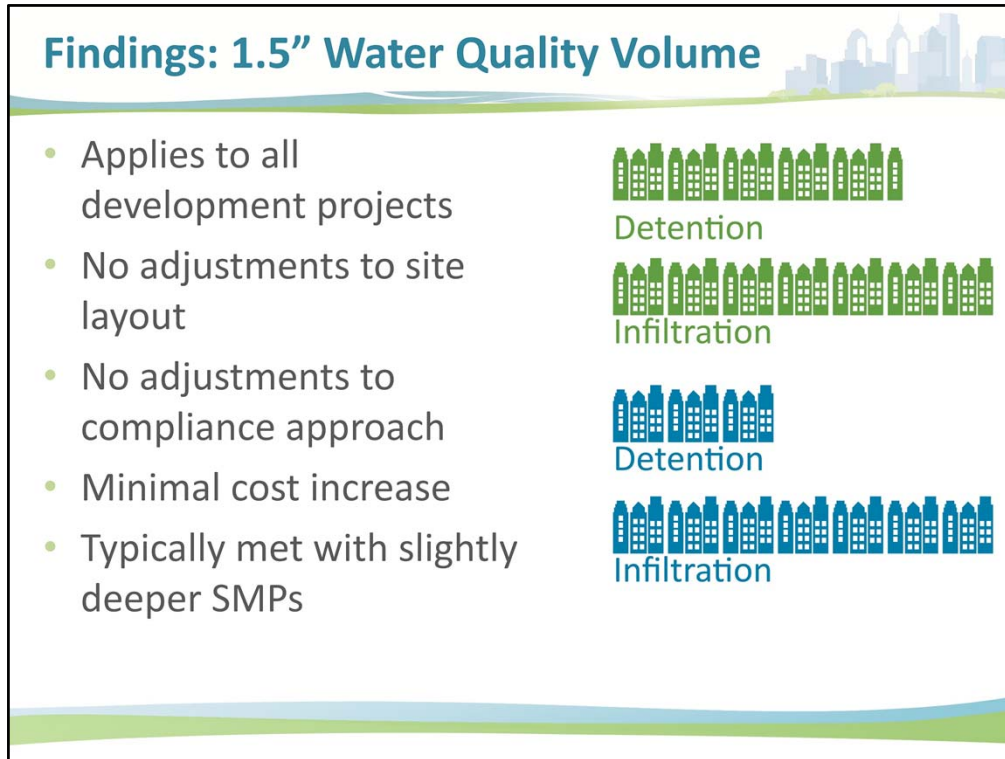


Sixteen sample sites were selected, representing a cross-section of development types in Philadelphia. Further, both infiltrating and non-infiltrating sites were chosen in the combined and separate sewer areas, representing the possible range of stormwater regulations applicability.

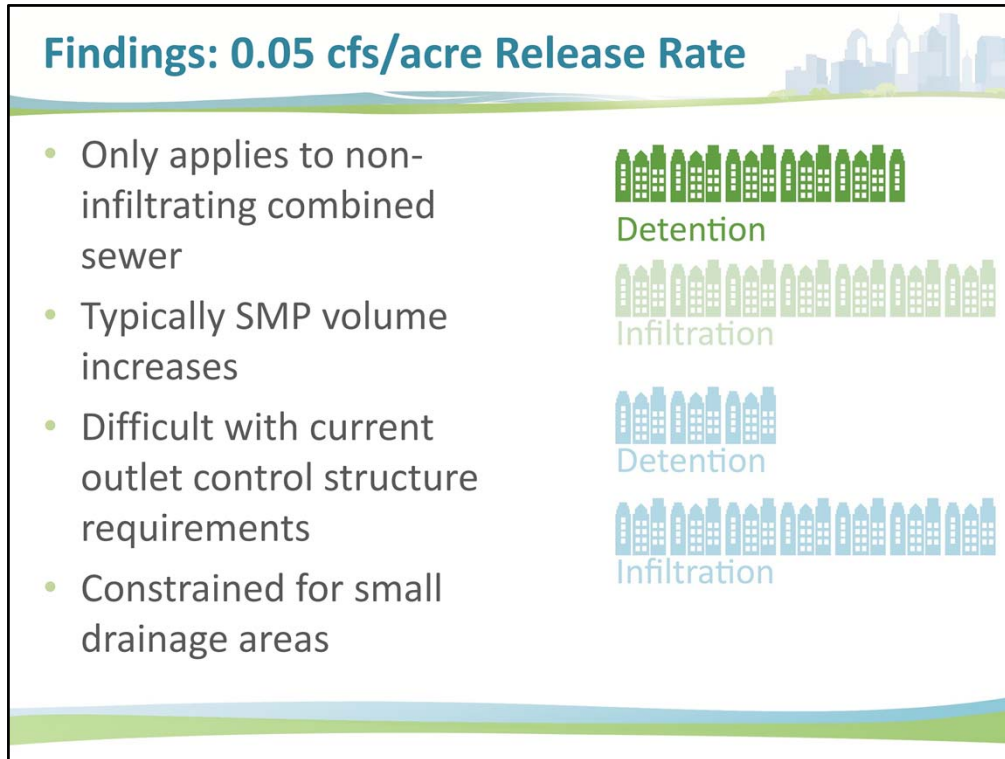
For reference:

- Approximately 74 projects are approved each year
- 53% of those projects are in the combined sewer service area and 47% are in the MS4 sewer service area
- Approximately 23% projects per year are detention projects in the combined sewer, which is important because the 100% pollutant removal requirement and the 0.05cfs/acre DCIA release rate only apply to these projects.

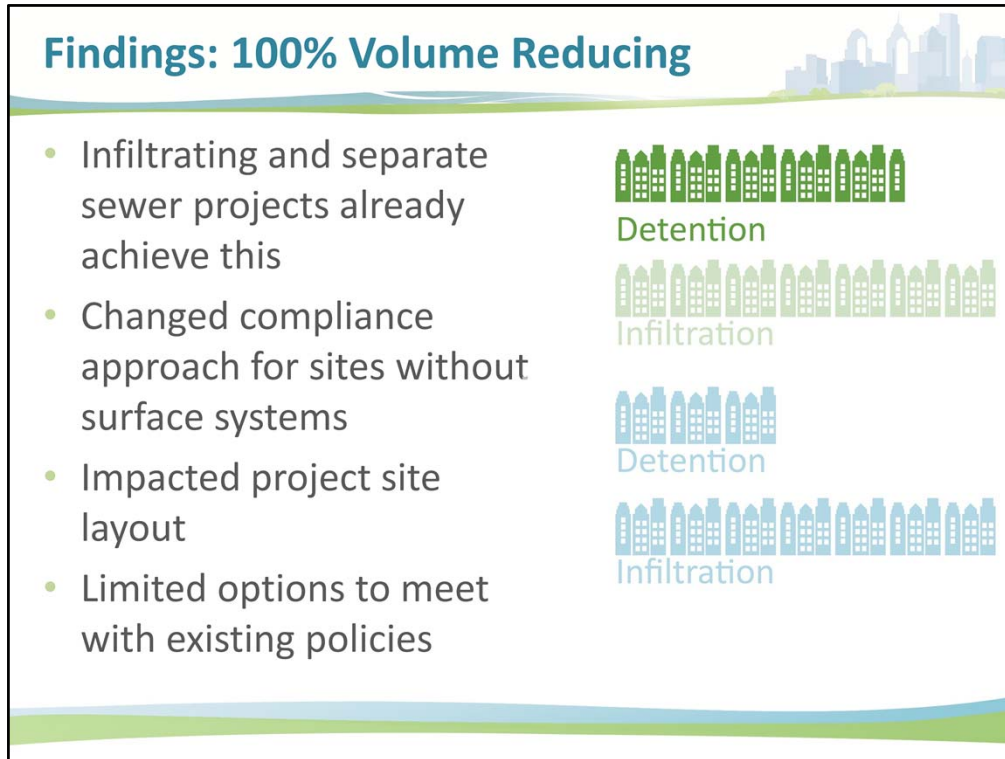




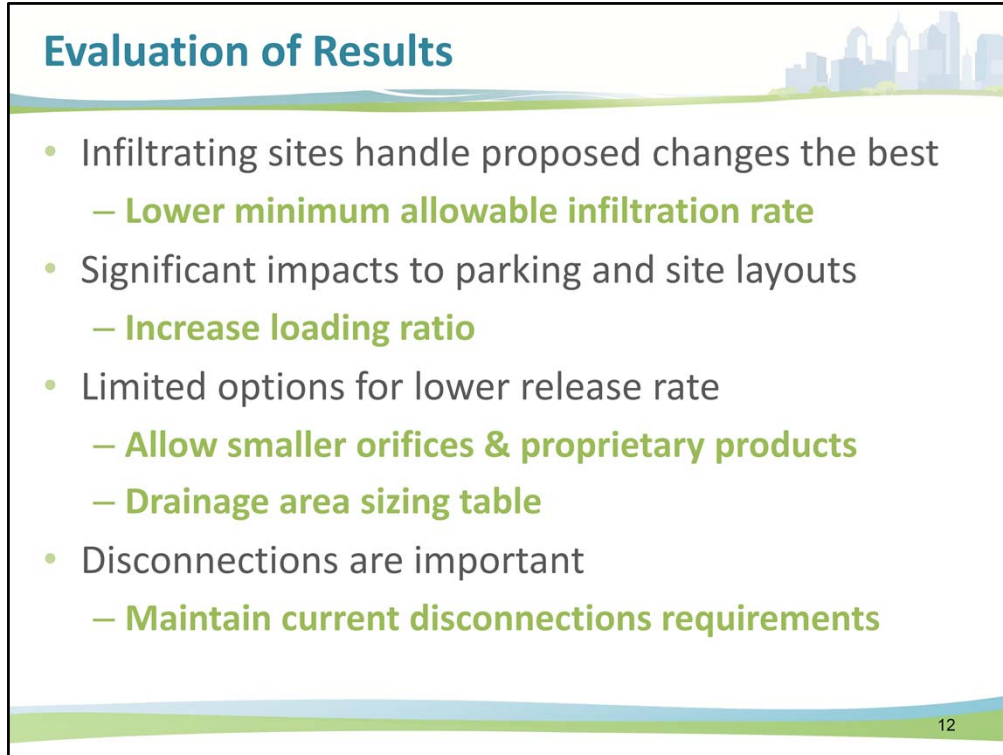
The proposed Water Quality Volume increase is the only proposed regulation change that applies to all development types regardless of sewer shed and a project’s ability to infiltrate. Although this change applies to all projects, it was found to have no impacts to site design/layout and required no changes to the stormwater compliance approach. None of the case studies required additional SMPs to meet this requirement. In general, this regulation change would necessitate only minor adjustments to outlet control structures – overflow elevations could generally be increased by a matter of inches to provide the additional volume. Overall, this regulation change results in minimal design changes and minimal cost increases.



The 0.05 cfs/acre-DCIA maximum release rate requirement applies only to non-infiltrating projects in the combined sewer area – this translates to about 23% of projects city-wide. Based on the modeling exercise, PWD found that decreasing the maximum release rate to 0.05 cfs/ac-DCIA typically required increases in SMP volume. In some instances where site constraints precluded increased basin foot prints, SMP storage media needed to be revised from typical pipe-in-stone systems to storage vaults. This likely results in increased costs and also was found to sometimes extend basin drain down times beyond 72 hours. In general, it was observed that the reduced rate could not be met with PWD’s existing outlet control requirements (minimum orifice diameter). In order to attenuate flow to the reduced rate, orifice diameters very often needed to be less than 3 inches with proprietary rate control devices required in more extreme cases. Further, it was observed that meeting the decreased release rate was especially difficult for small drainage areas.



Similar to the release rate requirement, the proposed 100% volume reducing requirement applies only to non-infiltrating sites in the combined sewer area (about 23% of all projects city-wide). Further, it should be noted that this requirement is already applicable in the separate sewer area. For non-infiltrating projects in the combined sewer area, impacts to site layout were found to be significant. In most cases, additional bioretention SMPs had to be incorporated which impacted useable space. In some cases, substantial reduction in parking area was required to accommodate the increase in bioretention area. In general, this proposed regulation change was impactful because of the limited options available (green roofs, porous pavement, bioretention basins) and the loading ratio requirement, which drives the required size of the bioretention basins.



## Evaluation of Results

- Infiltrating sites handle proposed changes the best
  - **Lower minimum allowable infiltration rate**
- Significant impacts to parking and site layouts
  - **Increase loading ratio**
- Limited options for lower release rate
  - **Allow smaller orifices & proprietary products**
  - **Drainage area sizing table**
- Disconnections are important
  - **Maintain current disconnections requirements**

12

From the technical analysis of the proposed regulation changes, PWD observed that the ability to infiltrate plays a key role in how the changes impact sites. Overall, infiltrating sites were resilient to the proposed regulations, requiring only minimal design changes. Understanding this, PWD is considering lowering the minimal allowable infiltration rate to allow more sites to use infiltrating SMPs.

Additionally, PWD observed that some of the proposed regulation changes impact site layout and parking. To mitigate this problem, PWD is considering increasing the maximum loading ratio permitted on infiltrating and bioretention/bioinfiltration basins, effectively decreasing the size of these SMPs. This will create more flexibility for designers.

In order to accommodate the reduced release rate, PWD is considering allowing smaller orifice sizes and providing clear guidance on proprietary rate control devices. Similarly, PWD is working to provide sizing tables to help with the design of certain SMPs needing to meet the low release rate.

Finally, while disconnections are not a solution for all development types, PWD recognizes that they are a very useful tool toward achieving overall compliance. Accordingly, PWD will maintain all current disconnection requirements (regardless of the Water Quality Volume increase). This increases the relative value of disconnections and helps provide some stability in the upcoming regulatory changes.

## Water Quality Treatment Optimization

| Combined Sewer Water Quality Treatment Requirement                |   |  |
|---|---|--|
| Current   | Proposed  | Revised  |
| 20% Non-infiltrating DCIA routed through volume reducing practice | <b>100%</b> Non-infiltrating DCIA routed through <b>pollutant</b> reducing practice | 100% Non-infiltrating <b>Surface</b> DCIA routed through pollutant reducing practice |

- Need more options
- Must meet CO&A mass capture
- Business friendly
- Volume reducing to pollutant reducing
- Optimize requirement to treat the dirtiest runoff

13

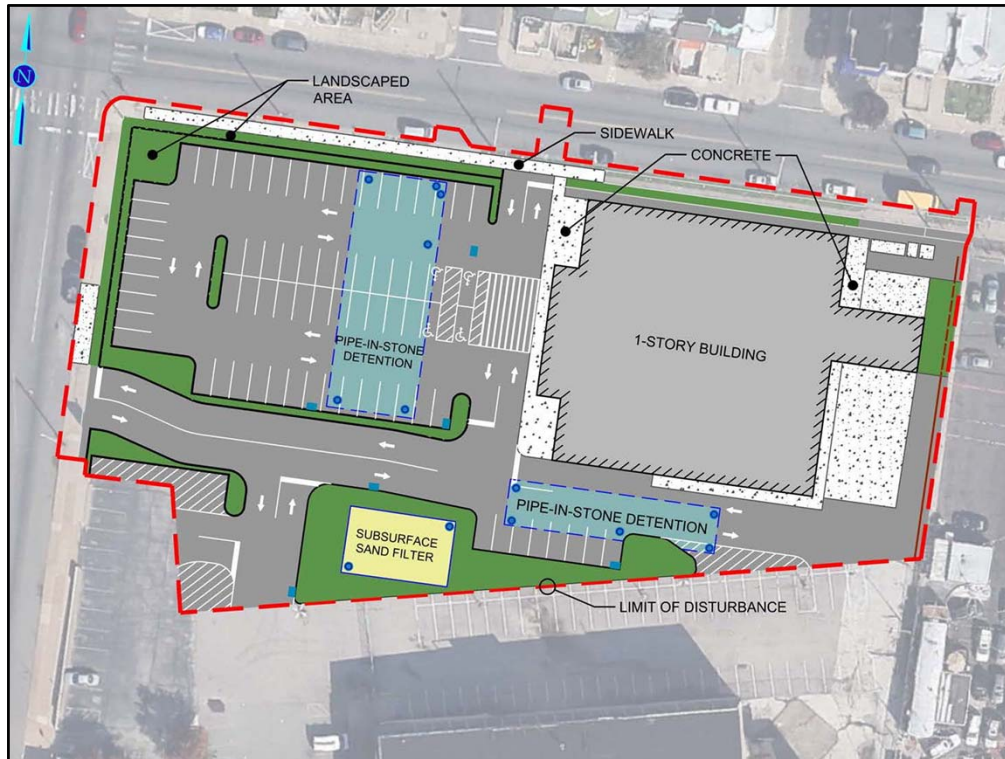
PWD recognizes that an increase in loading ratio allowed on bioretention/bioinfiltration basins will significantly reduce the burden of the proposed change from 20% to 100% routing. However, the Water Department sought to provide more options for meeting this new regulation. After re-evaluating the overall intent of the water quality treatment component of the CO&A, PWD revised the regulation to stipulate that 100% non-infiltrated DCIA must be routed through a **pollutant-reducing** (rather than volume-reducing) practice. This opens the door to new SMPs such as sand filters and proprietary inlet filter devices that provide mass capture.

To further optimize the Water Quality Treatment regulation, PWD has revised the regulation to focus on capturing the dirtiest runoff sources in the combined sewer. This further refinement ensures that the regulation is both effective and meaningful.





This example is a previously approved stormwater management plan under the current Stormwater Regulations. The project is located in the combined sewer area with a compliance approach of one bioretention system to meet the 20% volume reducing practice requirement and two subsurface detention basins to meet the water quality release rate and the flood control requirements.



This example is a potential stormwater management plan using PWD's new July 2015 regulations. The site layout is exactly the same as the originally approved design on the previous slide. A subsurface sand filter is used to meet the 100% pollutant removal requirement and two detention basins are used to meet the slow release rate requirement and the flood control requirement.

Some key notes:

- All parking spaces are maintained
- Option for entirely subsurface practices
- New sand filter option that wasn't available before



This is an example of how the design community can optimize development sites with the new stormwater regulations. 17 parking spaces were replaced with landscaped area to achieve a 20% reduction in impervious area and exempt the site from the Flood Control Requirement. All the impervious surfaces were sent to a central bioretention facility that is sized with a 16:1 loading ratio to meet the Water Quality Requirement.

Key notes:

- 1 surface SMP that is easy to inspect and maintain
- Potentially cheaper solution due to reduction in SMPs



### July 2015 Regulations

|                         |                | Current              | July 2015                              |
|-------------------------|----------------|----------------------|--|
| Water Quality Volume    |                | 1.0"                 | <b>1.5"</b>                            |
| Water Quality Rate      |                | 0.24 cfs/acre        | <b>0.05 cfs/acre</b>                   |
| Water Quality Treatment | Separate Sewer | 100% Volume Reducing | 100% <b>Pollutant</b> Reducing         |
|                         | Combined Sewer | 20% Volume Reducing  | <b>100% Surface Pollutant</b> Reducing |

Technical Requirements & Policies Adjustments  
Loading ratio, proprietary products, orifice sizes, allowable infiltration rate, drainage area sizing charts, standard details, soil storage credit

17

The three regulation changes that PWD will be implementing in July 2015 are an increase in the Water Quality Volume from 1 to 1.5-inches, a decrease in the slow release rate from 0.24cfs/acre to 0.05cfs/acre, and the change to 100% pollutant removal for surface DCIA in the combined sewer and 100% pollutant removal for all DCIA in the separate sewer.

In addition, PWD is still evaluating technical requirements and policies and is open to discussions and feedback on what changes would make development easier and help PWD meet the CO&A targets.

## PROCEDURAL IMPROVEMENTS



## What We've Heard

- **Predictability while balancing flexibility**
- **Process incentives and Manual improvements**
- **Making green stormwater design a priority**
- **Expansion of Expedited Reviews**

19

PWD has been hearing the theme of “time is money” since the DSC started in 2012, and is trying to address this by making the process more predictable while still allowing for flexibility in design. Balancing these two items will be important to a successful regulatory update.

Along with this theme, PWD knows the development community would like to see more options to expedite review and get to approval faster. Further, when asked about procedural improvements in a 2014 survey, DSC members voted process incentives and Manual improvements the highest, indicating that this was a place for PWD to spend their time.

## Process Incentives

- **Transparent application resources**
  - PCSMP submittal format template
  - Reworked Technical Worksheets
- **Restructured ERSA Application**
  - Trigger questions that determine applicability
- **Updated Plan Review Website**
  - Better navigation and user friendly interface
  - Connection with Manual & additional resources

20

PWD is investigating several process incentives to improve submittals and facilitate faster reviews and approvals. By creating more transparent application resources, PWD seeks to limit misinterpretation and uncertainty in the design and submittal process. While revising technical worksheets, PWD's goal is to create forms that can ensure the project is in compliance before even submitting to PWD. This will limit the back and forth exchange of comments and length of reviews.

PWD plans to restructure the online ERSA application to incorporate trigger questions so an applicant can immediately identify their project type and complete the application specific to their development. This will ensure PWD collects the right information early in the process, and the applicant is not asked to submit materials that are not necessary.

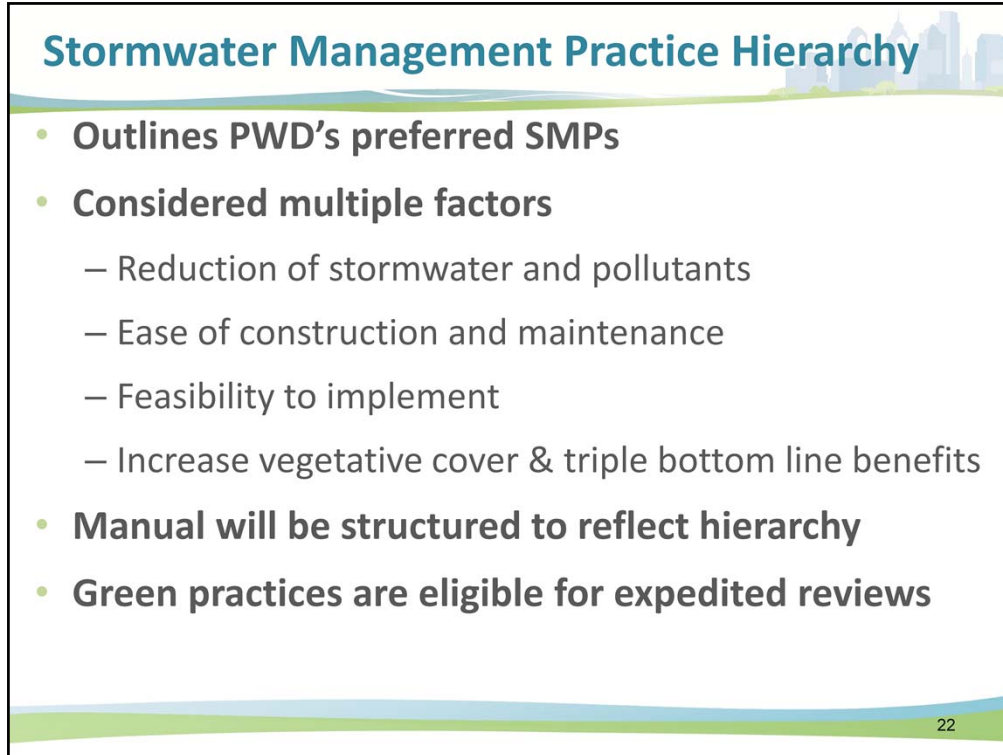
PWD also intends to update the Plan Review website to be more user-friendly and searchable so relevant information is easy to find. PWD will ensure better access to the Guidance Manual by providing a digital format in addition to the downloadable PDFs.

## Guidance Manual Improvements

- Provide clear policies rather than recommendations
  - **Explicit requirements for SMP Design, Infiltration Testing, & Submission Materials, with SMP Details.**
- Address multiple audiences
  - **Comprehensive design, construction, and maintenance guidance**
- Provide guidance on SMPs in series
  - **Expanded SMP options and Dedicated Design Strategy Section**
- Prioritize SMPs based on PWD's level of preference
  - **SMP Hierarchy**

21

PWD conducted manual interviews with 15 of the most frequently submitting engineering firms. As a result of this feedback, PWD will be focusing on four major areas of improvement. In order to distinguish between policies and recommendations, PWD will provide explicit requirements for the following: SMP Design, Infiltration Testing, and Submission Materials, which includes the development of standard details for certain SMPs. Similarly, PWD is developing comprehensive design, construction and maintenance guidance to reach broader audiences in the development community. Regarding SMP guidance, PWD is committed to providing design flexibility and is in the process of developing a dedicated Design Strategy section for the Manual. As a complement to the Design Strategy, PWD will provide a SMP Hierarchy that identifies the Department's preferences and will be reflected in the organization of the individual SMP sections within the Manual.

A presentation slide titled "Stormwater Management Practice Hierarchy" with a decorative header and footer. The header features a blue and green wave pattern and a city skyline silhouette. The footer has a similar wave pattern and the number "22".

## Stormwater Management Practice Hierarchy

- **Outlines PWD's preferred SMPs**
- **Considered multiple factors**
  - Reduction of stormwater and pollutants
  - Ease of construction and maintenance
  - Feasibility to implement
  - Increase vegetative cover & triple bottom line benefits
- **Manual will be structured to reflect hierarchy**
- **Green practices are eligible for expedited reviews**

22

PWD's SMP Hierarchy will outline the Department's preferred SMPs and will be integrated into the design process reflected in the manual. Multiple factors were considered while developing the hierarchy. Although performance – reduction of stormwater and pollutants – is critical, it was not the only factor. Additional factors include the ease of construction and maintenance, feasibility to implement and the potential to increase vegetative cover and triple bottom line benefits. The organization of the SMP sections will be structured to mirror the hierarchy, and PWD is in the process of establishing an additional expedited review for its most preferred practices.

## Expedited Technical Reviews

| Standard Project Review   | Green Project Review  |
|---|---|
| <ul style="list-style-type: none"><li>• 15 Day Review Time</li><li>• All Development Types</li><li>• All Management Practices</li><li>• Infiltration Testing Required</li></ul> | <ul style="list-style-type: none"><li>• 5 Day Review Time</li><li>• Redevelopment Only</li><li>• Disconnection Practices Only</li><li>• Infiltration Testing Waived</li></ul> |

23

PWD has consistently received feedback requesting more expedited review options. As Stormwater Plan Review exists today, PWD offers a standard review as well as an expedited “Green Review,” for projects that disconnect 95% of DCIA.

## Expedited Technical Reviews

- New expedited review**
  - 5 Day Review Time
  - All Development Types
  - Bio Basins and Disconnection Practices Only
  - Infiltration Testing Waived until Construction
- Incentivizes the use of the higher ranked SMPs
- Expands the amount of projects eligible for expedited review

24

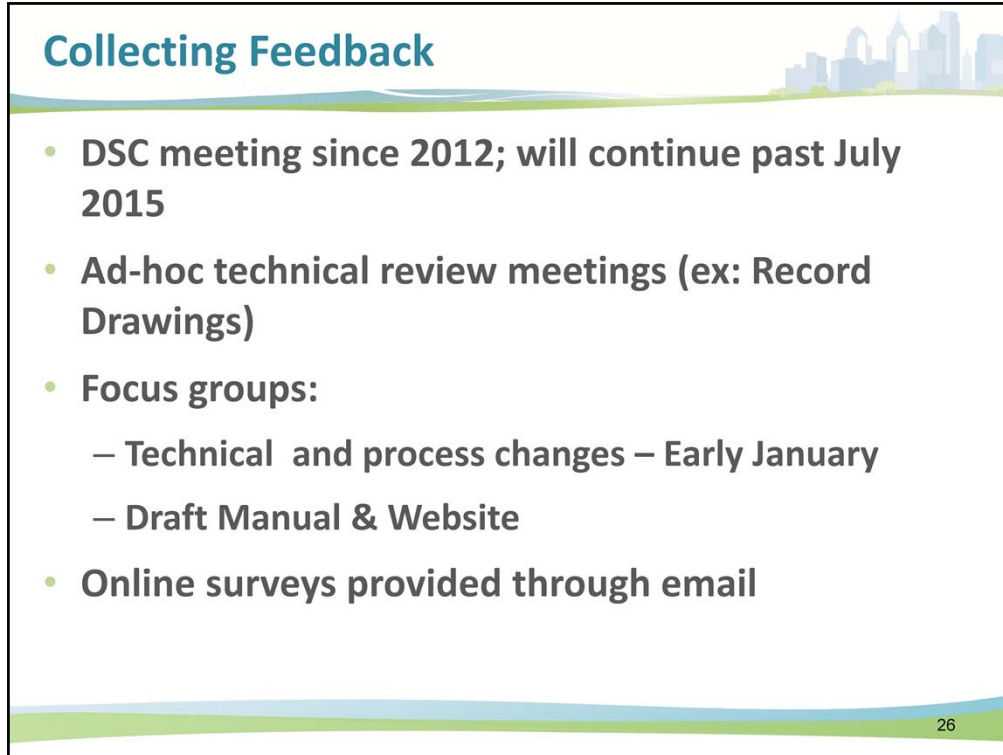
In response to feedback to date as well as the development of an SMP Hierarchy, PWD is introducing a new expedited review option. While this additional expedited review will increase the number of projects eligible for faster reviews, it will also expand the development types eligible, both redevelopment and new development. The review pertains to projects utilizing disconnections and surface bioinfiltration and bioretention practices, and will include the option to waive infiltration testing until construction. PWD recognizes that infiltration testing is critical to the system design, and is working on a standardized bio basin design to assure that the surface practice can be modified based on the testing results. Part of the solution are a combination of standard details and sizing tables that will assume the system can function as either retention or infiltration.

PWD is interested in continuing the dialogue of expedited review options, and intends to gather feedback in upcoming focus groups.



## OUTREACH





## Collecting Feedback

- **DSC meeting since 2012; will continue past July 2015**
- **Ad-hoc technical review meetings (ex: Record Drawings)**
- **Focus groups:**
  - **Technical and process changes – Early January**
  - **Draft Manual & Website**
- **Online surveys provided through email**

26

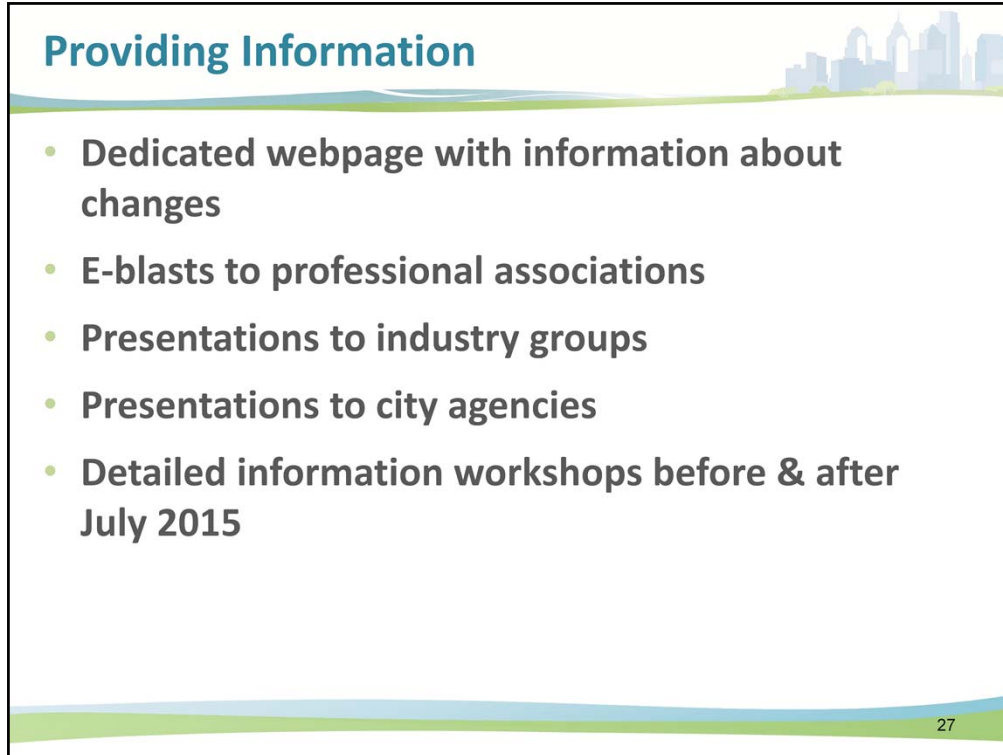
We think of outreach in two stages: collecting feedback from the Development Community and then distributing information.

PWD has been meeting with the Development Services Committee since February 2012. We will continue to meet with the DSC through July 2015, and after the changes to the regulations have been implemented.

We had success with an ad-hoc meeting to review Record Drawings. We may do something similar if there are substantial questions about some of these changes.

PWD is planning to have two focus groups with the developer and design community to discuss the changes. The first will be in early January to discuss technical and process changes. The second will be in the early Spring to discuss a draft manual and website.

PWD will also have online surveys for people who cannot attend the focus groups.



## Providing Information

- Dedicated webpage with information about changes
- E-blasts to professional associations
- Presentations to industry groups
- Presentations to city agencies
- Detailed information workshops before & after July 2015

27

Once we get closer to the implementation of the regulation changes, we will focus on providing information about the changes to as many people as possible.

This is one place where we can use the help of the Development Services Committee members and members of the Development Community. If you represent a professional organization, or know a group who would benefit from hearing about the regulation changes, please let us know.

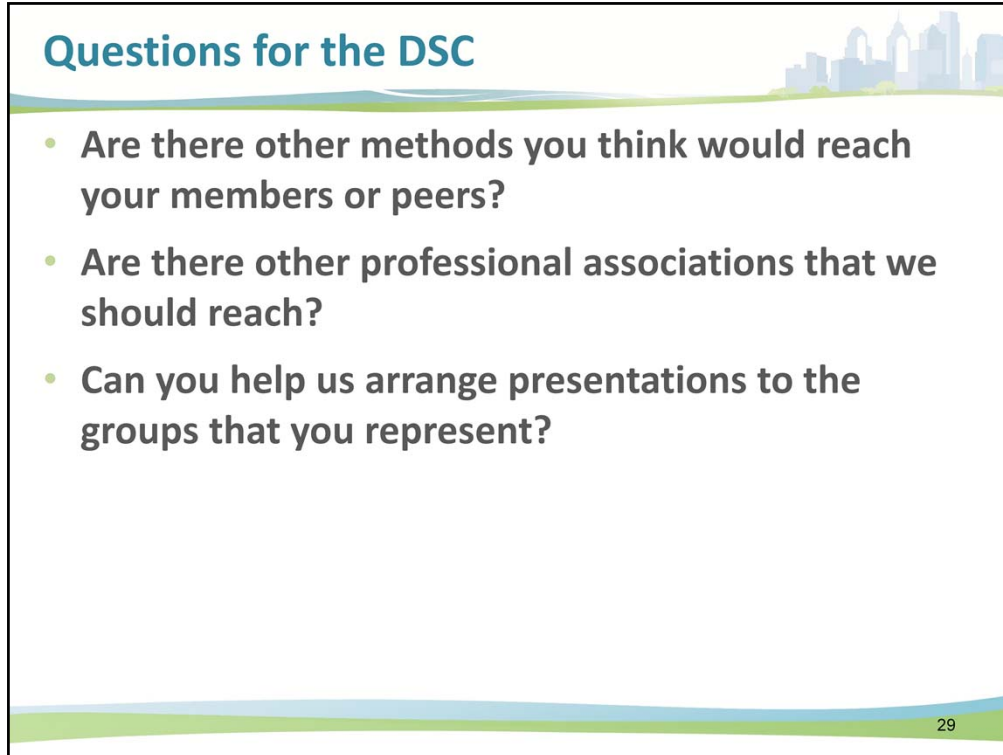


**Professional & Industry Associations**

- **ASCE** – American Society Civil Engineers
- **ASLA** – American Society Landscape Architects
- **BIA** – Building Industry Association
- **DVGBC** – Delaware Valley Green Building Council
- **Greater Philadelphia Chamber of Commerce**
- **Manufacturing Alliance of Philadelphia**
- **NAIOP** – Commercial Real Estate Development
- **SBN GSI Partners** – Sustainable Business Network
- **ULI** – Urban Land Institute
- **Philadelphia environmental organizations**

28

This is a sample of professional organizations PWD plans to reach out to. In addition to these, the DSC members suggested the American Institute of Architects and the American Planning Association.



### Questions for the DSC

- Are there other methods you think would reach your members or peers?
- Are there other professional associations that we should reach?
- Can you help us arrange presentations to the groups that you represent?

29

These are the questions we have for DSC members, so that we can work together to make sure every impacted party knows about the changes to the regulations.

## Stormwater Pioneers Program



- Recognizing the best in stormwater management on private property
- Showcasing innovation, excellence, the ability to overcome technical challenges, and dedication by the property owners, developers, and designers to improving the environment

30

PWD has just started a program called Stormwater Pioneers to provide public recognition for private properties that exemplify the best in stormwater management. PWD plans to select two Stormwater Pioneers per year. Winners of the award receive framed certificates, a plaque, and recognition on PWD's website: [www.phillywatersheds.org/stormwaterpioneers](http://www.phillywatersheds.org/stormwaterpioneers).



Our first Stormwater Pioneer was Stanley's Hardware located at 5555 Ridge Avenue in Roxborough. We celebrated Stanley's Hardware with a press event to unveil the plaque on November 20<sup>th</sup>. The project included a rain garden and 3 subsurface infiltration systems. Visit website to learn more about Stanley's Hardware.