

PWD DO Partnership Update

DRBC Water Quality Advisory Committee, **March 2018**



PHILADELPHIA
WATER
— DEPARTMENT —

Presented to an advisory committee of the DRBC on March 29, 2018. Contents should not be published or re-posted in whole or in part without permission of PWD.



OVERVIEW

1. DRBC Resolution
2. PWD Planning Process
3. Dissolved Oxygen Partnership

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DRBC Designated Use Resolution 2017-4

- **Sept. 2017 DRBC passed resolution initiating review of designated use in zones 3, 4, upper zone 5**
 - “...identify and encourage the implementation of practicable early actions that can be implemented by NPDES permittees in the near term to reduce the loading of ammonia and other oxygen depleting pollutants to the Estuary.”

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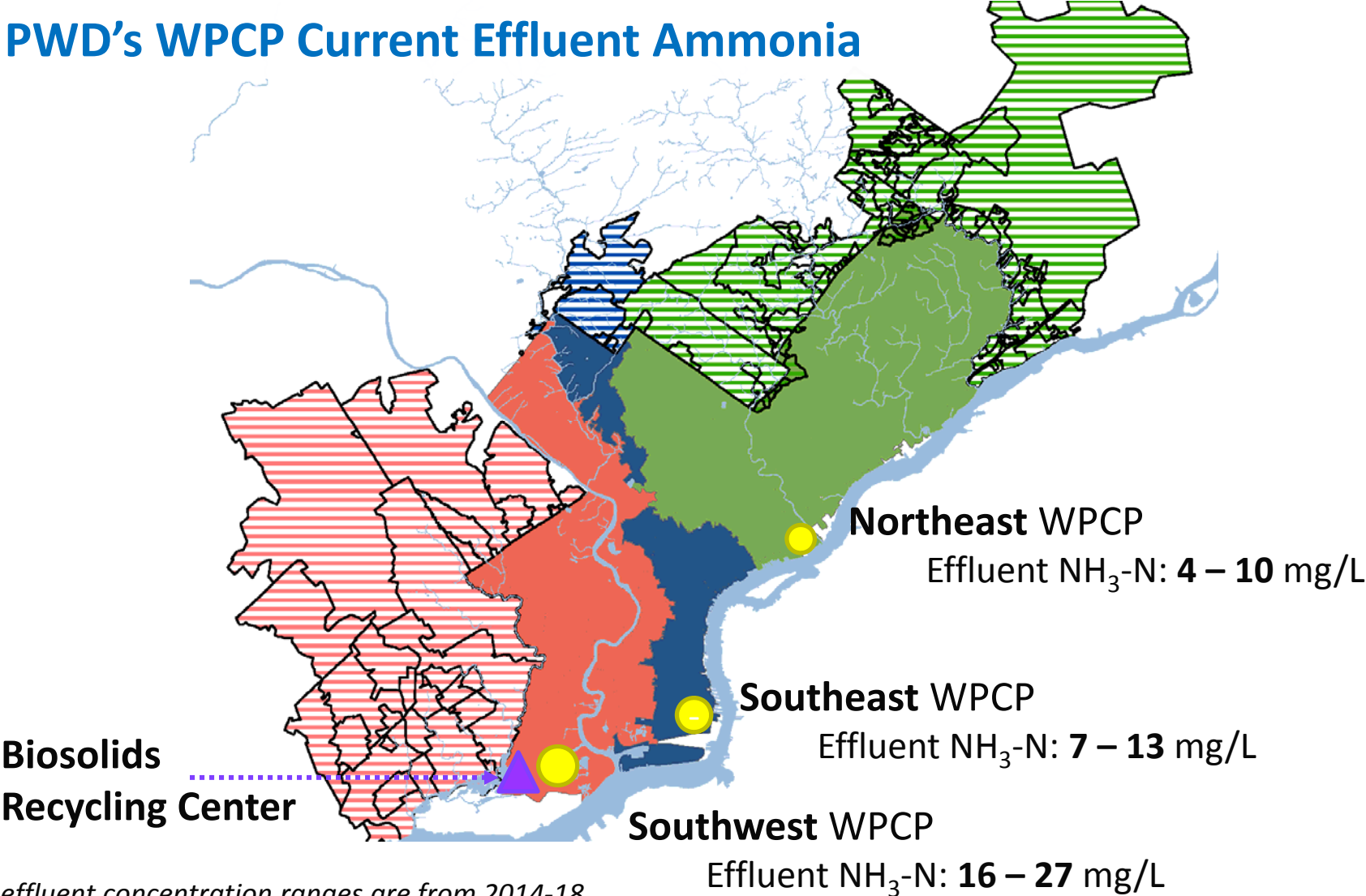
PWD Planning Process

- ▶ Background
- ▶ Integrated Planning
- ▶ Ammonia Reduction Planning

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Background

PWD's WPCP Current Effluent Ammonia



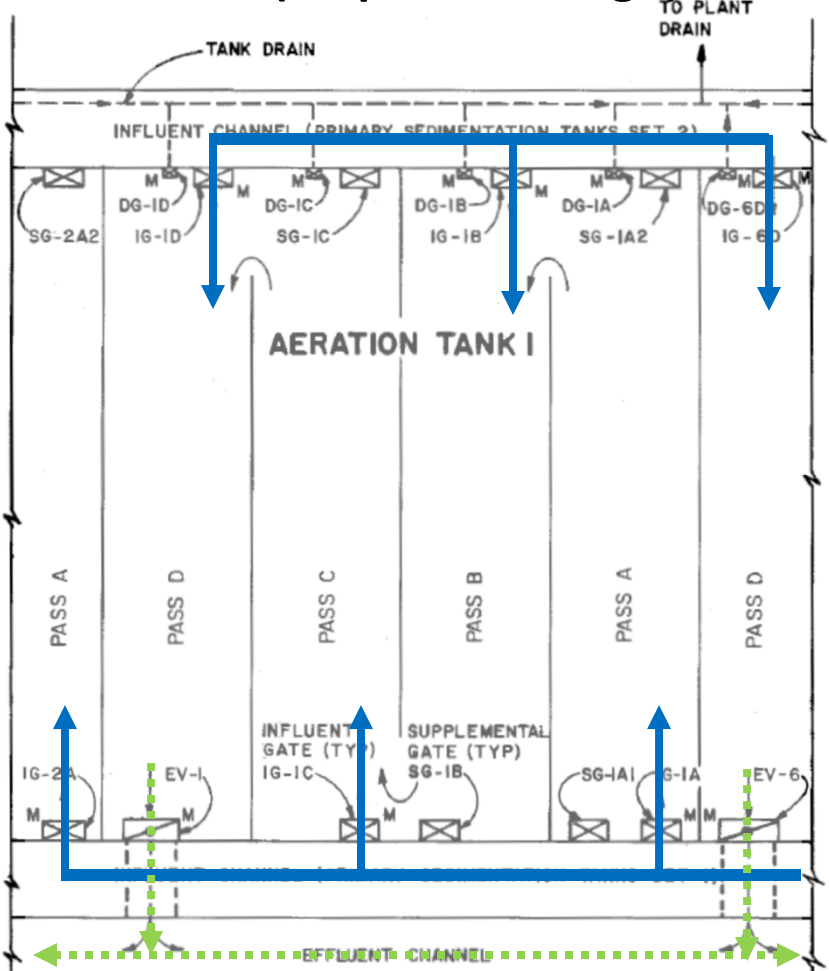
Note: effluent concentration ranges are from 2014-18 data.

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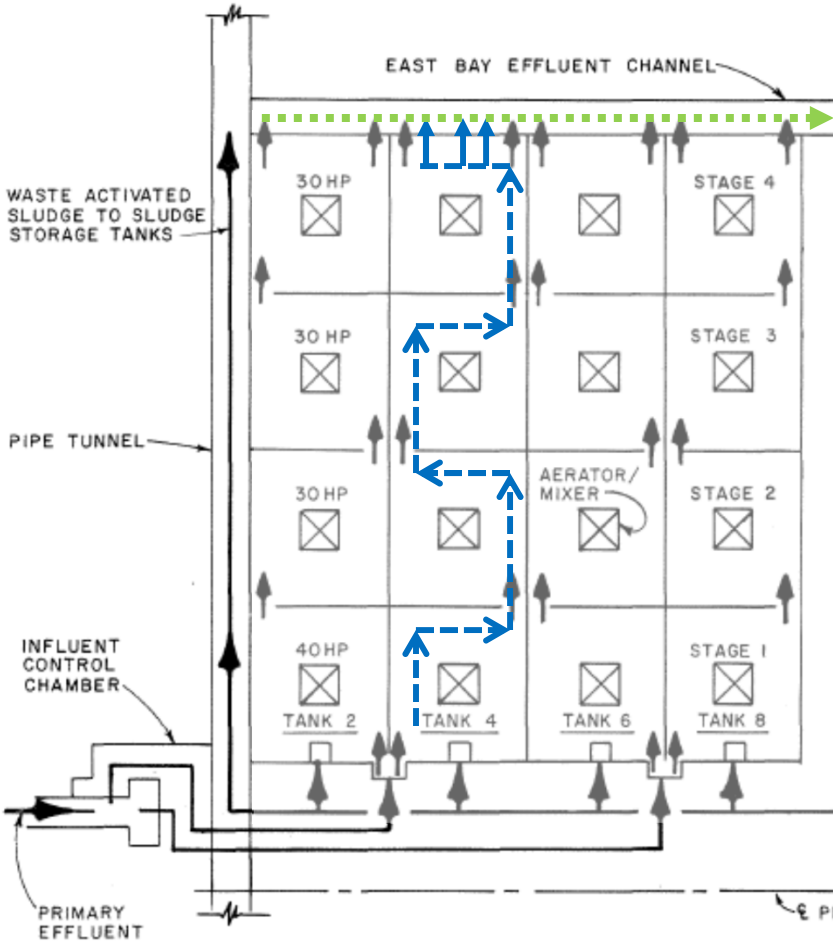
Background

PWD's WPCP Designs

NE WPCP (Step Feed Design)



SE and SW WPCPs (Plug Flow Design)



Integrated Planning

- **2013 – 2016: PWD Wastewater Master Plan**
 - Asset Inventory and Condition Assessment
 - Wet Weather (*i.e.*, CSO and Plant Capacity) Requirements
 - Energy Consumption and CO₂ Emissions
- **2015 – present: Nitrification Working Group**
 - PWD planning effort involving multiple teams within the utility:

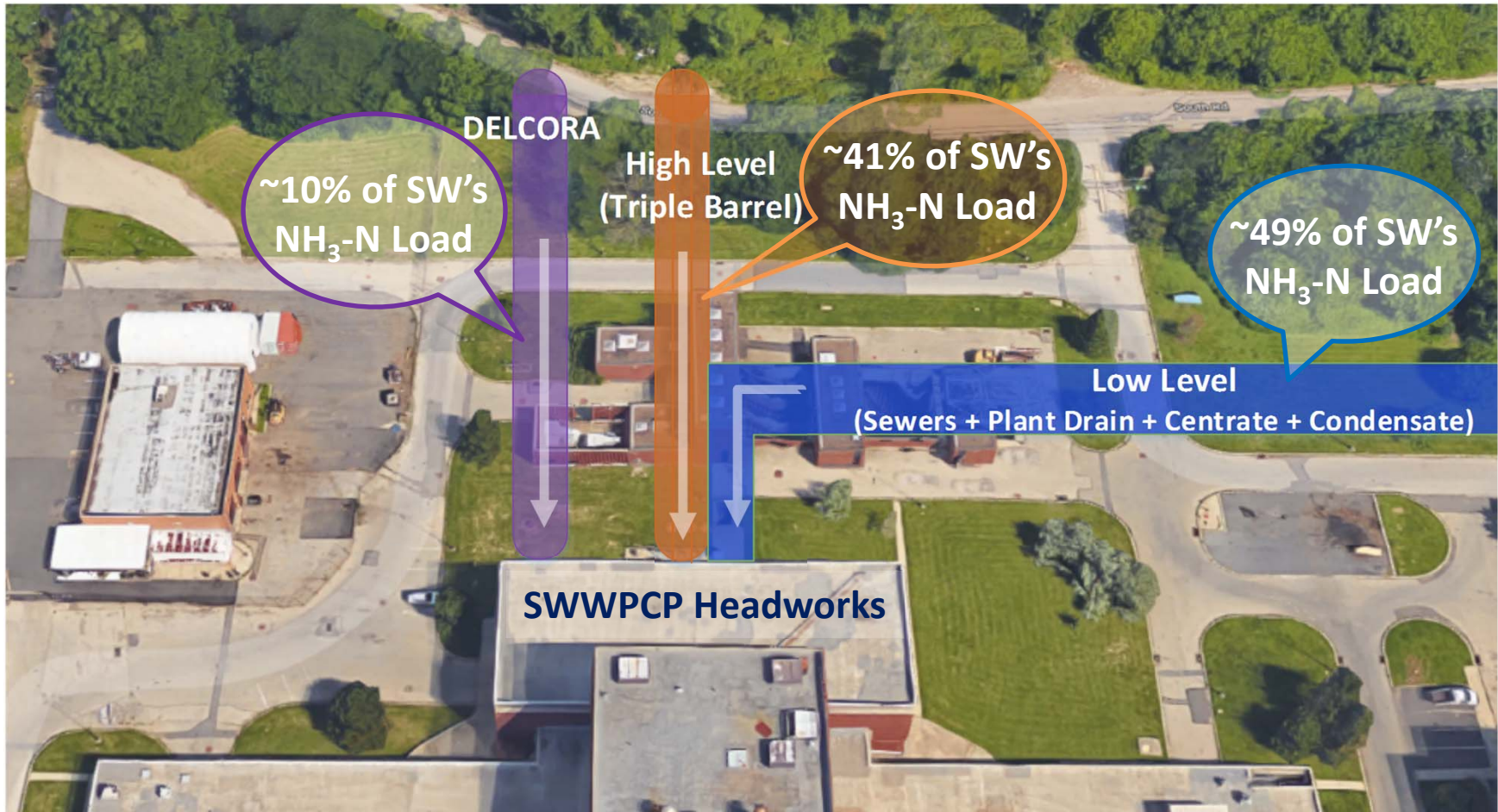
Working Group Members:

- Treatment Operations
- Bureau of Lab Services
- Office of Watersheds
- Planning and Research

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Ammonia Reduction Planning

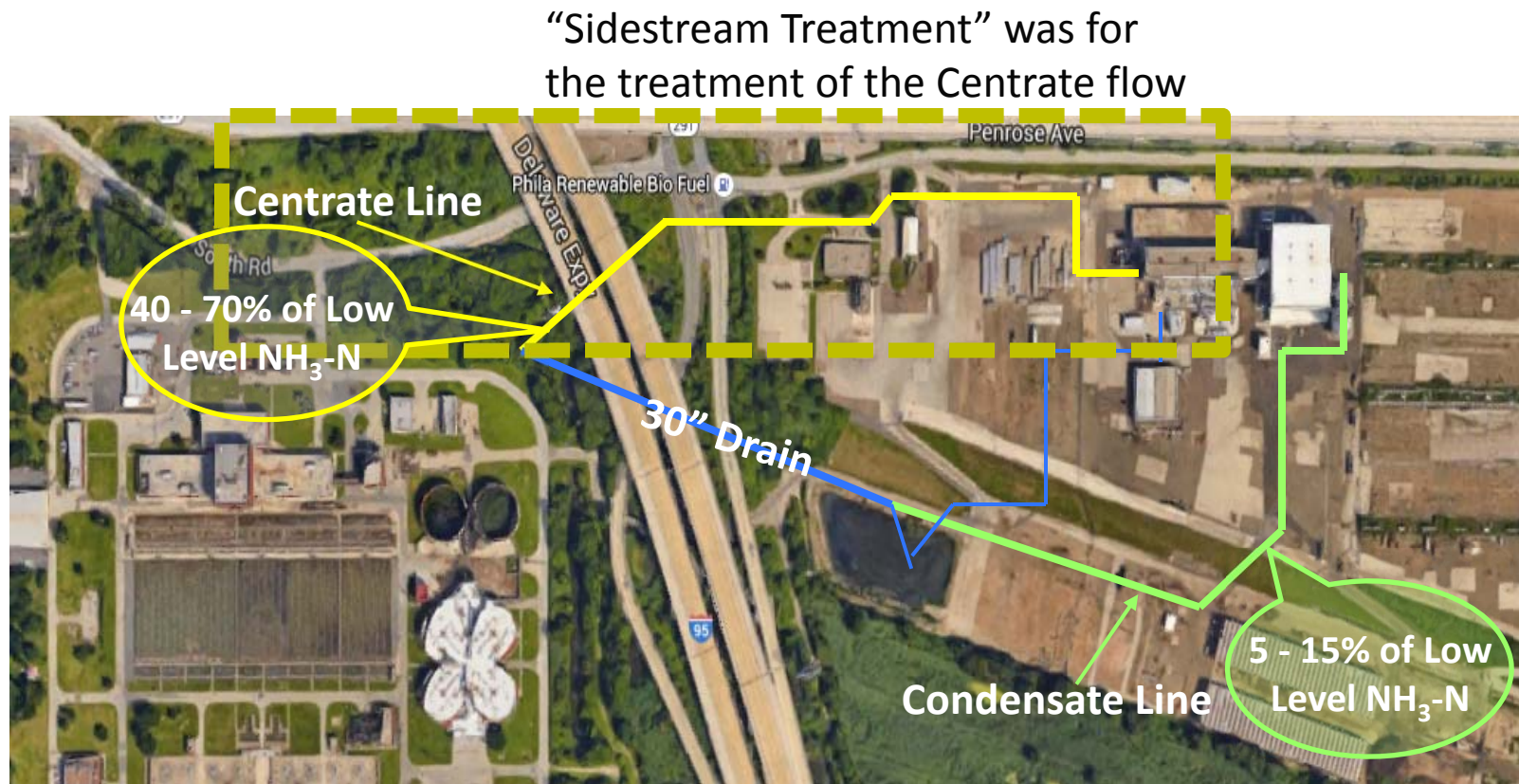
Southwest WPCP Influent Sources



Note: Influent percentages were identified in May 2017 sampling.

Ammonia Reduction Planning Process

SW Influent from BRC



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Note: Influent percentages were identified in May 2017 sampling.

Ammonia Reduction Planning

Recap

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2015

Hazen & Sawyer Evaluation

- BRC Centrate Line
- Alternatives, Conceptual Design and Cost Estimates
- Recommendations:
 - Sidestream Deammonification
 - Cost: \$26.2 M (2018 \$)
 - Retrofit Aeration Tank
 - Perform study on centrate
- SW Sidestream Treatment Project Targeted Bid: 2021

SWWPCP Aeration Train



Retrofit AT 1 or AT 9

Ammonia Reduction Planning

2016 – present

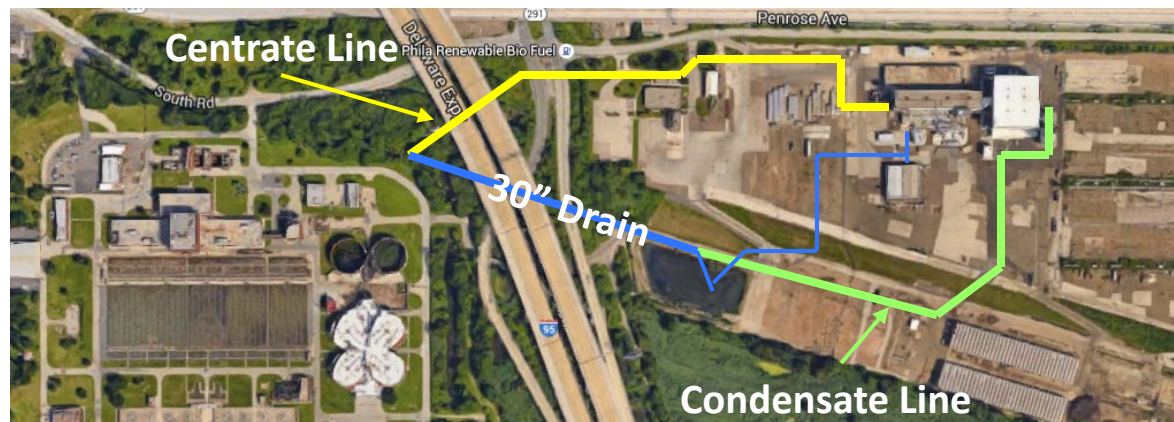
Wet Weather Requirements

- Wet Weather (85% CSO capture by Drainage District)
 - SWWPCP Capacity Evaluation: all process tanks are needed as-is

Ammonia toxicity criteria evaluation

SWWPCP Information

- More information on BRC recycle streams



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Ammonia Reduction Planning

Next Steps for Internal “Early Action”



Conduct sampling and analysis on recycle streams

*Proposed
Completion*

July 2018



Finalize the SWWPCP Process Model; direct modeling team to evaluate sidestream processes

*September
2018*



Issue RFI for Sidestream Treatment Technologies

*September
2018*



Identify solution(s) to reduce effluent $\text{NH}_3\text{-N}$ at SW

*January
2019*



Evaluate (model) all viable technology options; recommend final alternative for SW sidestream

*March
2019*

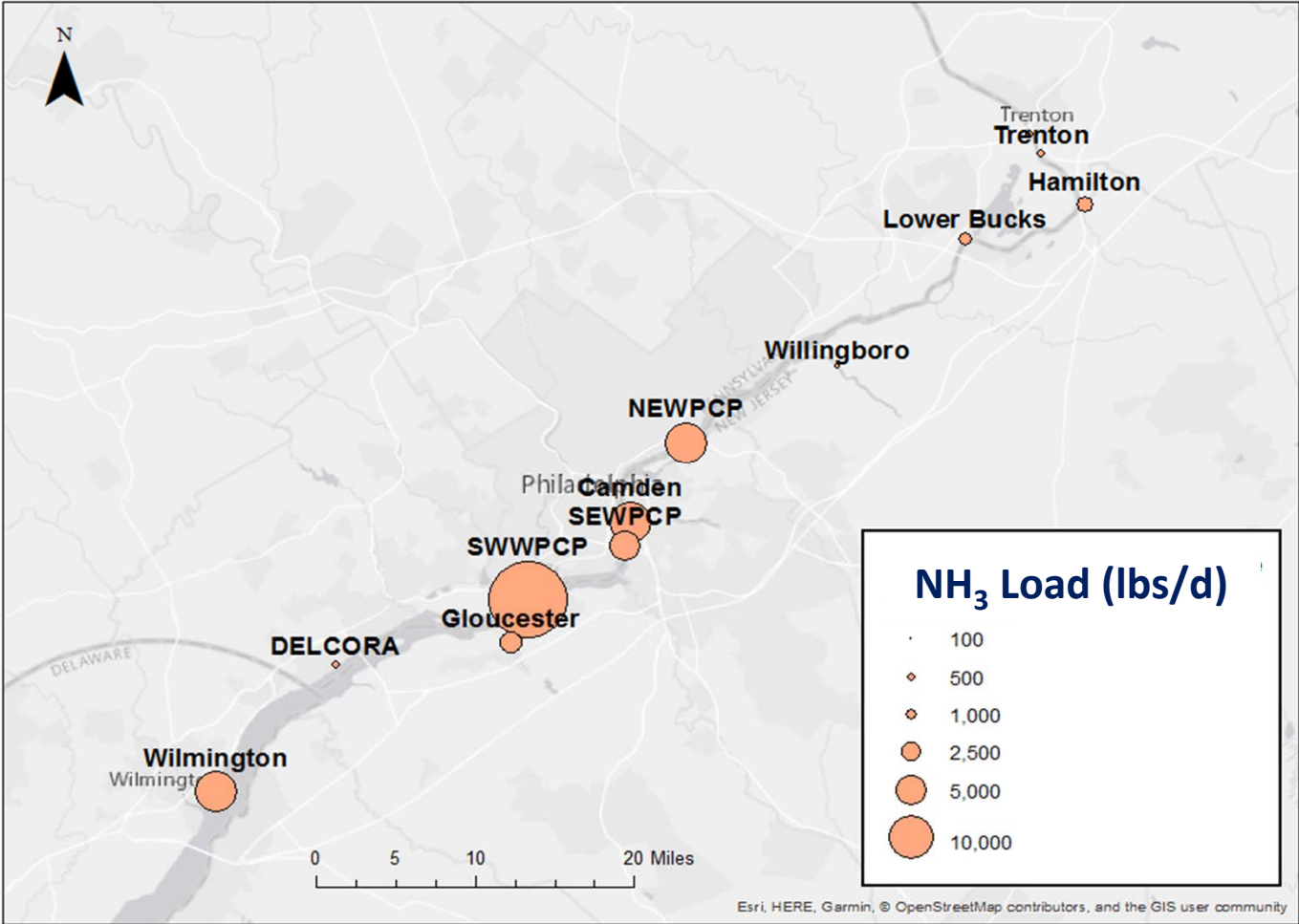
Dissolved Oxygen Partnership

- ▶ **Concept**
- ▶ **“Early Action”**
- ▶ **Next Steps**

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DO Partnership Concept

Dischargers of Ammonia to the Delaware Estuary

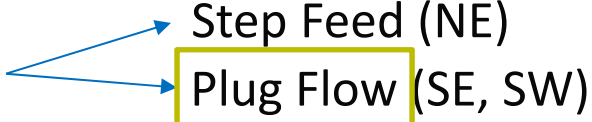
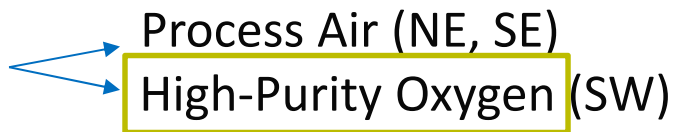


Why does “Early Action” = Sidestream Ammonia Reduction?

○ DRBC DO Resolution:

- “Opportunities [...] to reduce oxygen-depleting discharges to this stretch of river in the **short term**” (Press Release, 2017)

○ PWD’s WPCPs

- Design: Effects on retention time 
- Aeration: Effects on biological activity 
- SW WPCP is the plant of concern for effluent NH₃-N
No quick, low-cost operational “tweak” to *substantially* reduce effluent NH₃-N

- Sidestream treatment of ammonia-rich BRC flows is a means for PWD to implement “Early Action”.

Why does "Early Action" = the DO Partnership?

PWD is developing an RFP to facilitate the DO Partnership

- Proposed Facilitator duties include:
 - Organizing routine meetings of municipal dischargers
 - Collaborating with all parties on the science, engineering and costs associated with wastewater planning and capital projects
 - Increase dischargers' involvement in the review of Existing Uses and potential development of regulations
 - Share successful technologies and operational changes within discharger community

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Conclusions

- A DRBC planning process exists for improving Delaware River DO and PWD has committed to “Early Action”

- “Early Action” for PWD is sidestream treatment at SW WPCP

- PWD is presently updating assumptions and performing an analysis to identify the most cost-effective technology (completion ~March 2019)

- Results will be deliberated internally, P&R Research will administrate all work and contracts necessary to advance the selected project

- During this process P&R will issue an RFP for a DO Partnership Facilitator, as a commitment to “Early Action”

Thank you!

▶ Questions?

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