

LCA Board – ACT 537 Planning Program Management

June 27, 2022

Delivering a better world
1

AECOM



Lehigh County Authority

Agenda



- Brief Review of Prior Planning
 - 2013 - 2019
- Program Management's Role
- Realities & Fresh Thinking for next Phase
- 2022 Key Thrusts
- Schedule & AECOM Proposal
- Q&A



- **4 MGD Dry Weather / 9 MGD Wet Weather (“4/9”) Direct Discharge**
 - Tertiary Treatment of 4 MGD split at Pretreatment Plant (PTP)
 - Discharge directly via force main (FM) to the Lehigh River
 - Modest cost reductions in wet weather conveyance upgrades (smaller pipes)
 - PTP 4/9 option compared to 4 MGD expansion at Kline’s Island (KI)
- **Economics favored continuing to send all flows to KI**
- **DEP guidance received:**
 - Treatment capacity expansion not needed for at least 5 years
 - Documented findings and “put on shelf”
 - Focus on wet-weather management

In the interim period... 2016 Boston Beer projections drive PTP upgrade evaluations; Wet years 2018-2019; DEP prohibits blending

- **Re-activation of Planning –**

- KI Hydraulic Overload (2019)
- Interim 537/Corrective Action Plan (CAP)
- WQM Part 2 permit – KI Hydraulic Design Capacity = 44.6 MGD

- **11.7/30 PTP Direct Discharge Alternatives**

- Full PTP treatment; updated technology and Intermunicipal Agreement (IMA)
- 30 MGD wet weather treatment at PTP, via reversal of Spring Creek Pump Station flows
- Rigorous force main alignment study

- **FINDINGS**

- **11.7/30** “moves the needle” in terms of downstream conveyance system savings
- Significantly higher PTP upgrade cost – not likely to be favored
- DRBC weighs in: PTP / KI agreement needed to “trade” capacity, with added permit costs for both

AECOM Role as Program Manager

AECOM

Program Management

- Coordination
- Value Engineering
- Independent Review
- Regulatory Considerations
- Integrated Findings; Reporting & Recommendations



Jacobs



Program Challenges Create Complexity and Risk

AECOM

- » Inter - Dependencies Between Projects
- » Organizational and Process Change
- » Range of Technical Issues & Requisite Expertise
- » Compliance and Stakeholder Expectations
- » Mega - Data and Information

***Projects produce
outputs***

***Programs deliver
outcomes***



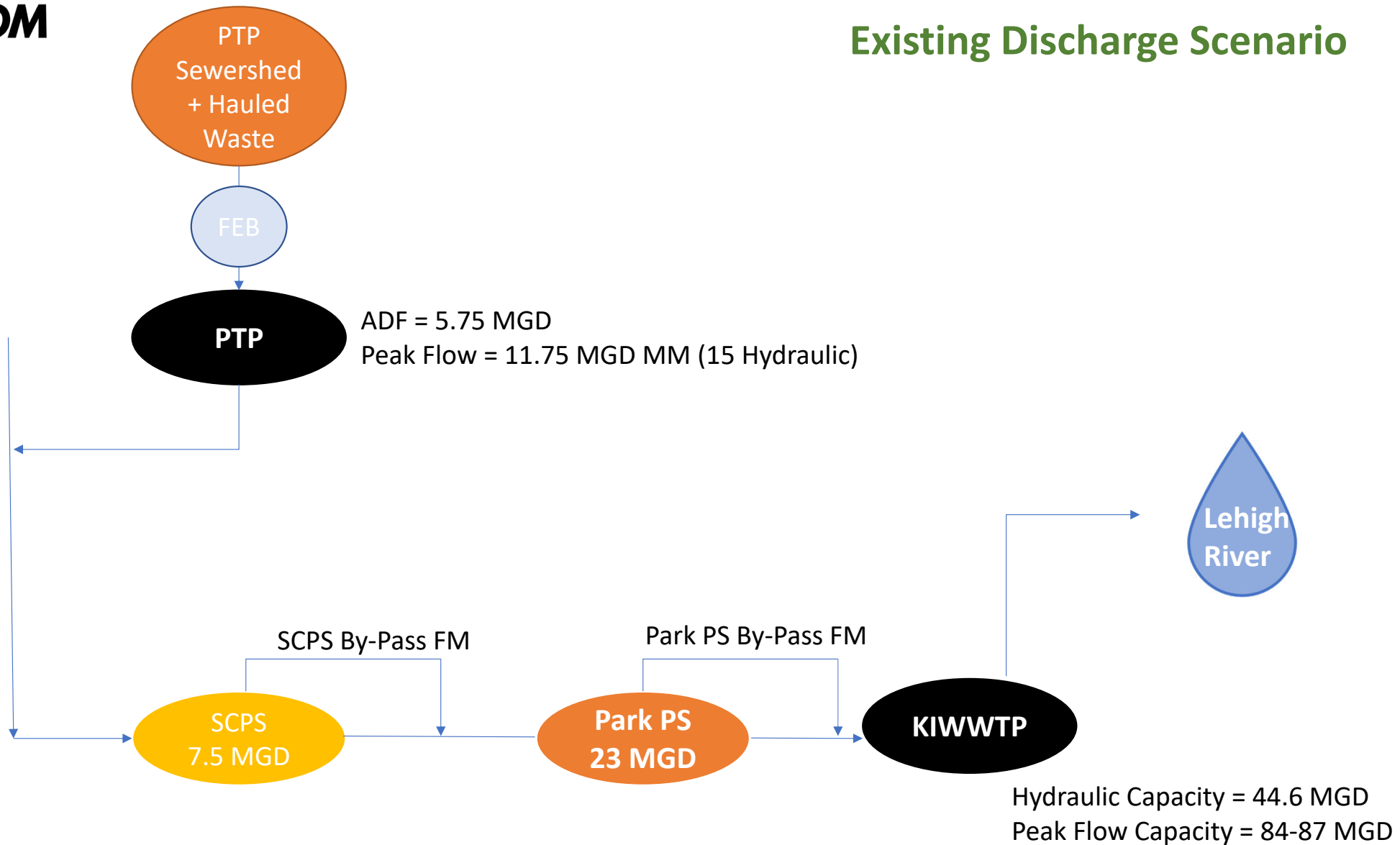
District of Columbia Blue Plains WWTP
Largest Advanced WWTP in the World

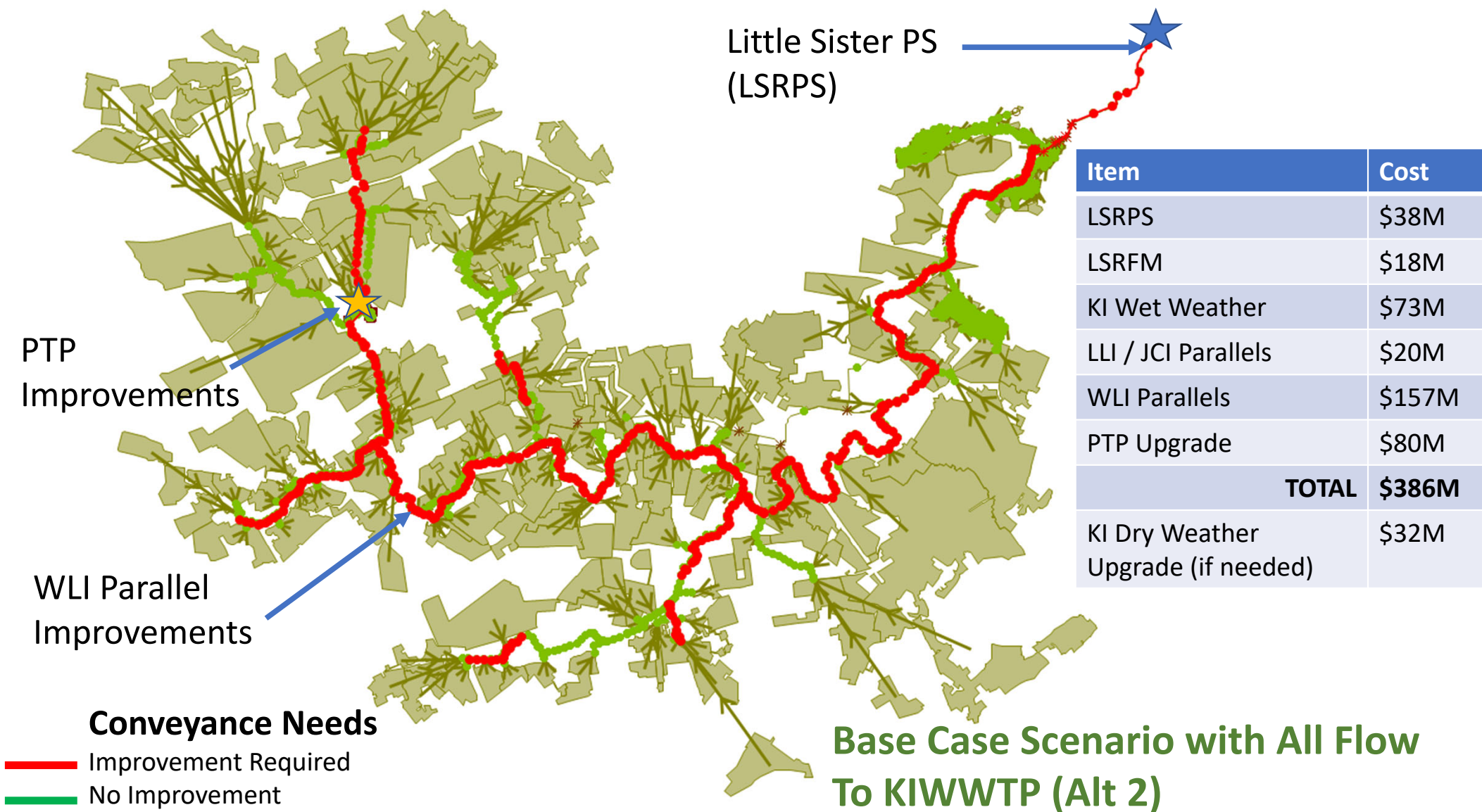
Realities and Fresh Thinking

- **PTP –**
 - Robust Organic Removal
 - Nitrification Required for Direct Discharge (at great expense)
 - Doubles aeration volume and Aeration Power + 50%
- **KI –**
 - Robust Nitrification
 - Organic Capacity sufficient to handle growth through 2035
- **Considerations for Conveyance System Upgrades -**
 - Reducing size of a new facility saves a little
 - Eliminating the need for new facility saves a lot
 - Build a new facility bigger for incremental cost
- **How to leverage both PTP and KIWWTP to overall cost-effective solution?**
- **Fresh Thinking**
 - 4/30; 0/30; 0/40
 - PTP Master Plan Value Engineering and Alternatives
 - Exploring region's true capacity needs

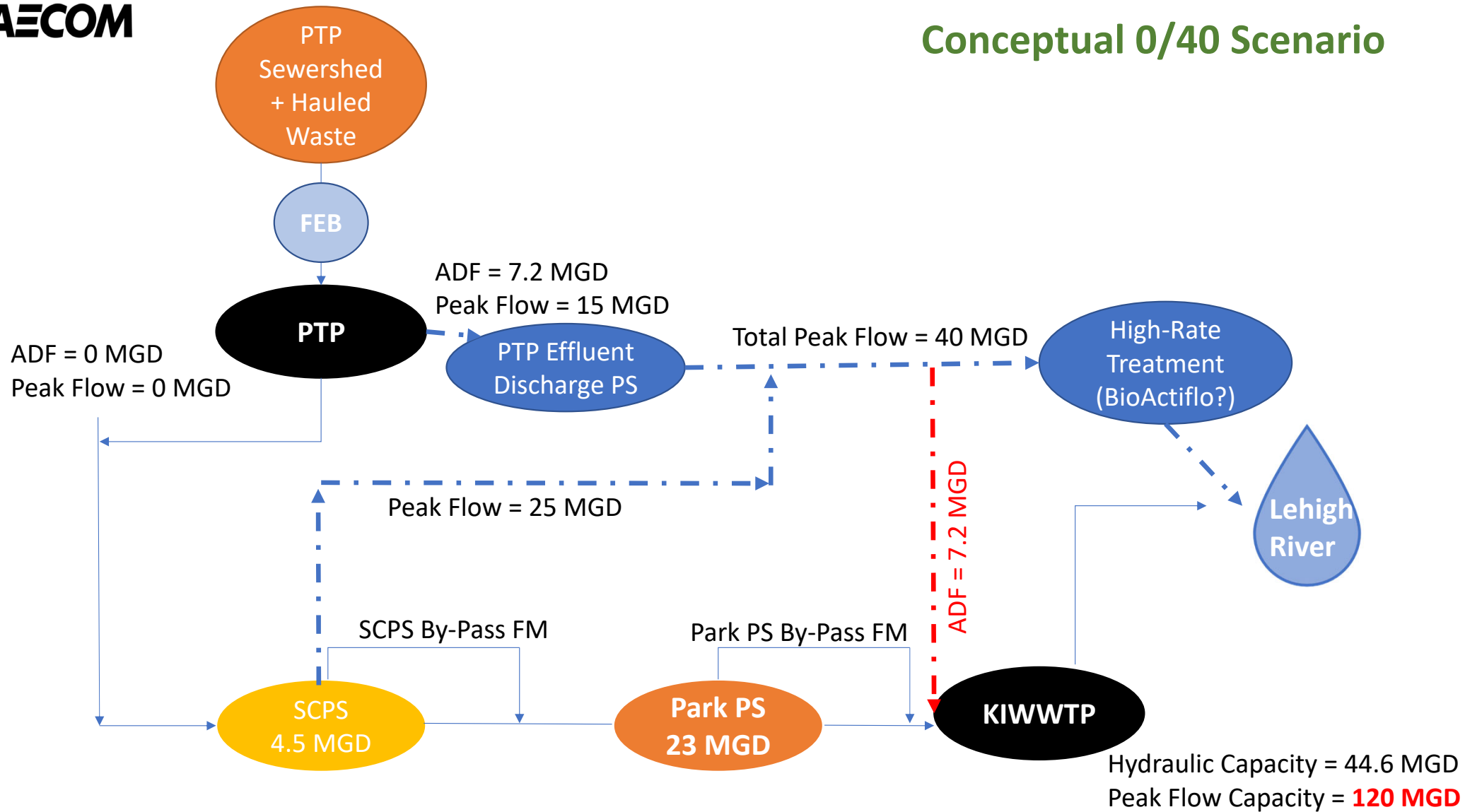


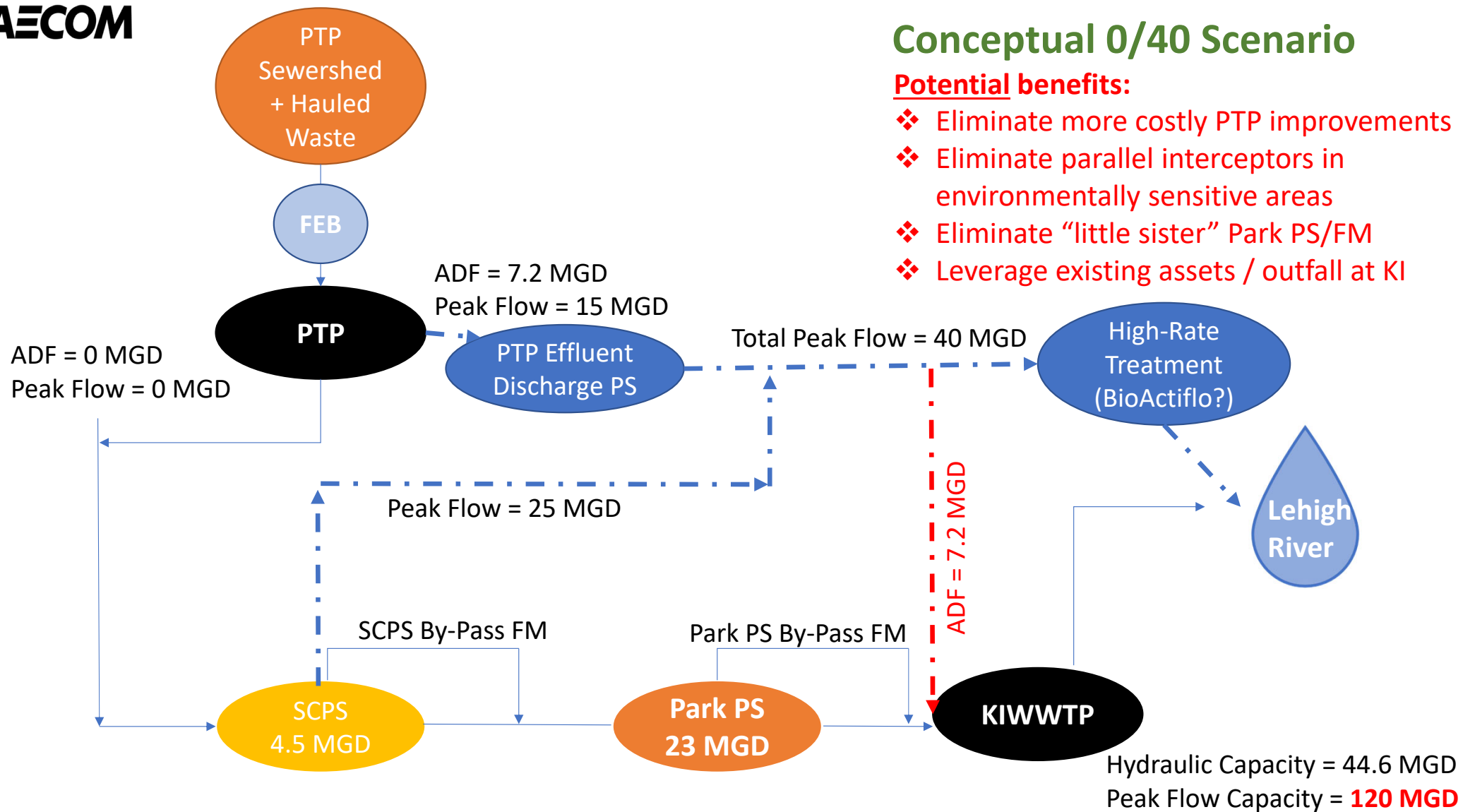
Existing Discharge Scenario





Conceptual 0/40 Scenario





Direct Discharge – Effluent FM Scenarios

**FM goes to KI - add
dry weather diversion**

AECOM

KIWWTP

**Eliminate
Little Sister PS/FM**

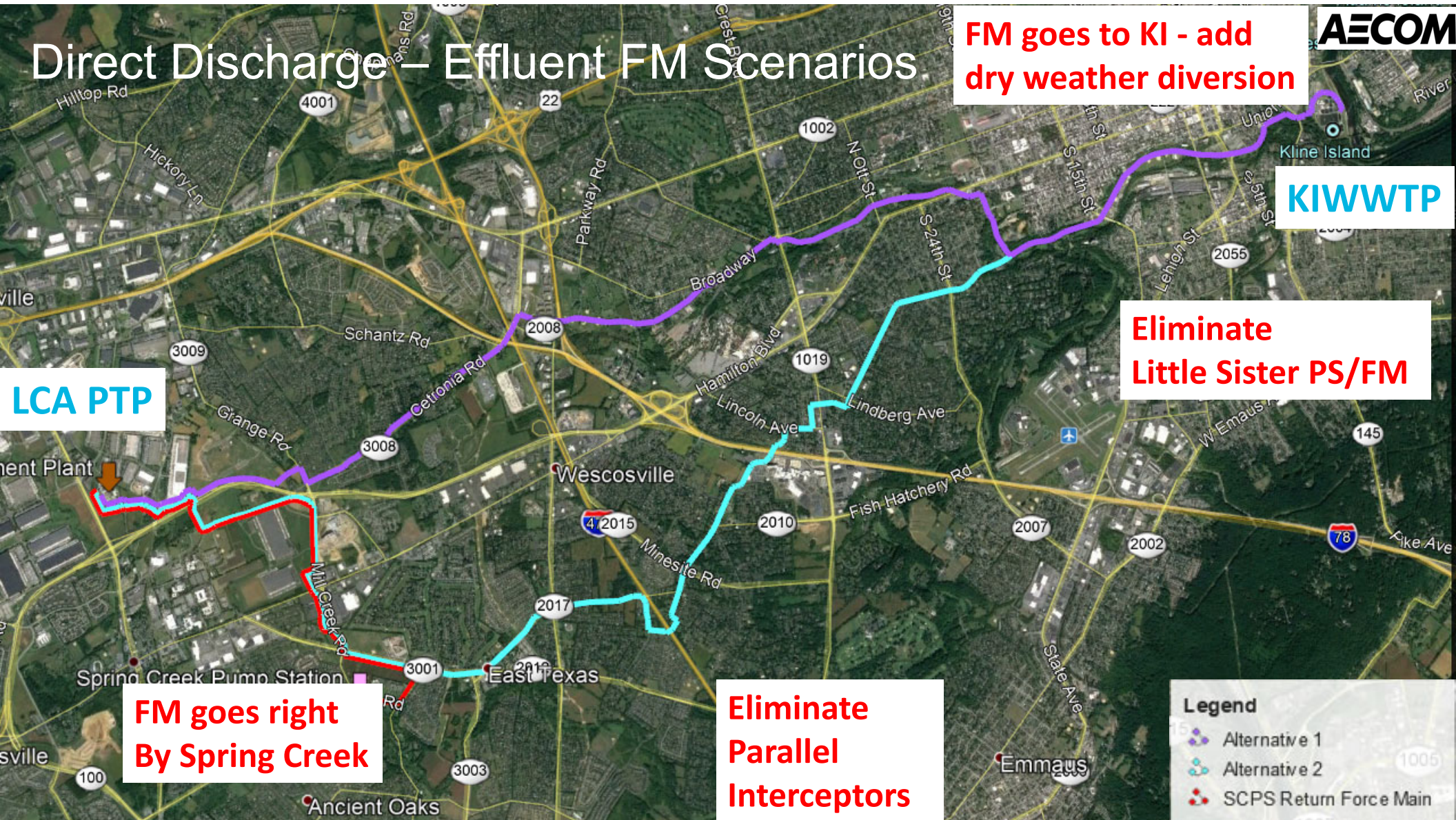
LCA PTP

**FM goes right
By Spring Creek**

**Eliminate
Parallel
Interceptors**

Legend

- Alternative 1
- Alternative 2
- SCPS Return Force Main



2022 “Window” & Key Thrusts



- **ARCADIS – Collection & Conveyance System**
 - Model Calibration and Simulations
 - “Common Sense” I&I Program and preliminary screening of alternatives
 - Peak KI Flow
- **Jacobs - PTP**
 - PTP Master Plan (Baseline) - authorized
 - Alternatives (next up) – Boston Beer Expansion; Cost-Reducing Alternatives
 - What else is possible? – Renewable Natural Gas: cost savings, doing the right thing
- **Kleinfelder – KI**
 - Peak Capacity Improvements Ph. 1 Design – upgrade existing components (87-100 MGD)
 - Peak Capacity Improvements Ph. 2 Planning - parallel trickling filter operation (100-120 MGD)
- **AECOM – Program Management**
 - Regulatory Guidance
 - Revenue Planning Tool Simulations
 - Vetting PTP options & optimization with KI options, conveyance alternatives
 - Alternatives analysis for KI peak flows > 120 MGD (0/40 scenario, BioActiflo, others)

Alternative (Non-Financial/Risk) Considerations

AECOM

- Construction challenges
- Technological Risk (New Process Commissioning)
- Permitting
 - KI Approach: more impact to sensitive stream corridors / dewatering needs
 - PADEP / DRBC
 - Easement Requirements
- Community drivers
 - KI Approach: more impact to recreational corridors
 - Direct Discharge: Traffic impacts with force main routes
- Sequencing
 - KI Approach: Conveyance and wet weather phasing to achieve SSO reductions and match growth
 - Direct Discharge: requires both high-rate treatment and effluent FM improvements concurrent (higher initial capital outlay)
- Flexibility
 - KI Approach: Phasing approach to wet weather
 - Direct Discharge: Schedule acceleration for wet weather



What is Next



What are
the next
major Act
537
activities?

Preliminary Screening of Alternatives

- October 2022 – February 2023

Final Alternatives Analyses

- March 2023 – December 2023

Selection of Solution

- January 2024 – April 2024

Finalize Act 537 Plan

- May 2024 – August 2024

Act 537 Municipal Approval Process

- September 2024 – March 2025



AECOM Deliverables



Preliminary Screening of Alternatives

• October 2022 – February 2023

- Coordination with other consultants
- Development of preliminary screening of alternatives
- Refinement of wet weather scenarios
- Vetting technical evaluations (PTP, KIWWTP, Conveyance)
- Summary of process modeling evaluations (if warranted)
- Development of conceptual sketch for proposed use of KIWWTP Outfall 002
- Preparation of conceptual layout for needs of the Spring Creek Pump Station alternatives
- Compilation of updated opinions of probable construction
- Maintenance of Act 537 program schedule
- Revenue Tool Evaluations
- Documentation of key findings, decisions, and analyses completed for future inclusion in Act 537 Plan



Thank you Questions?

AECOM | June 27, 2022

Delivering a better world
17

AECOM



Lehigh County Authority