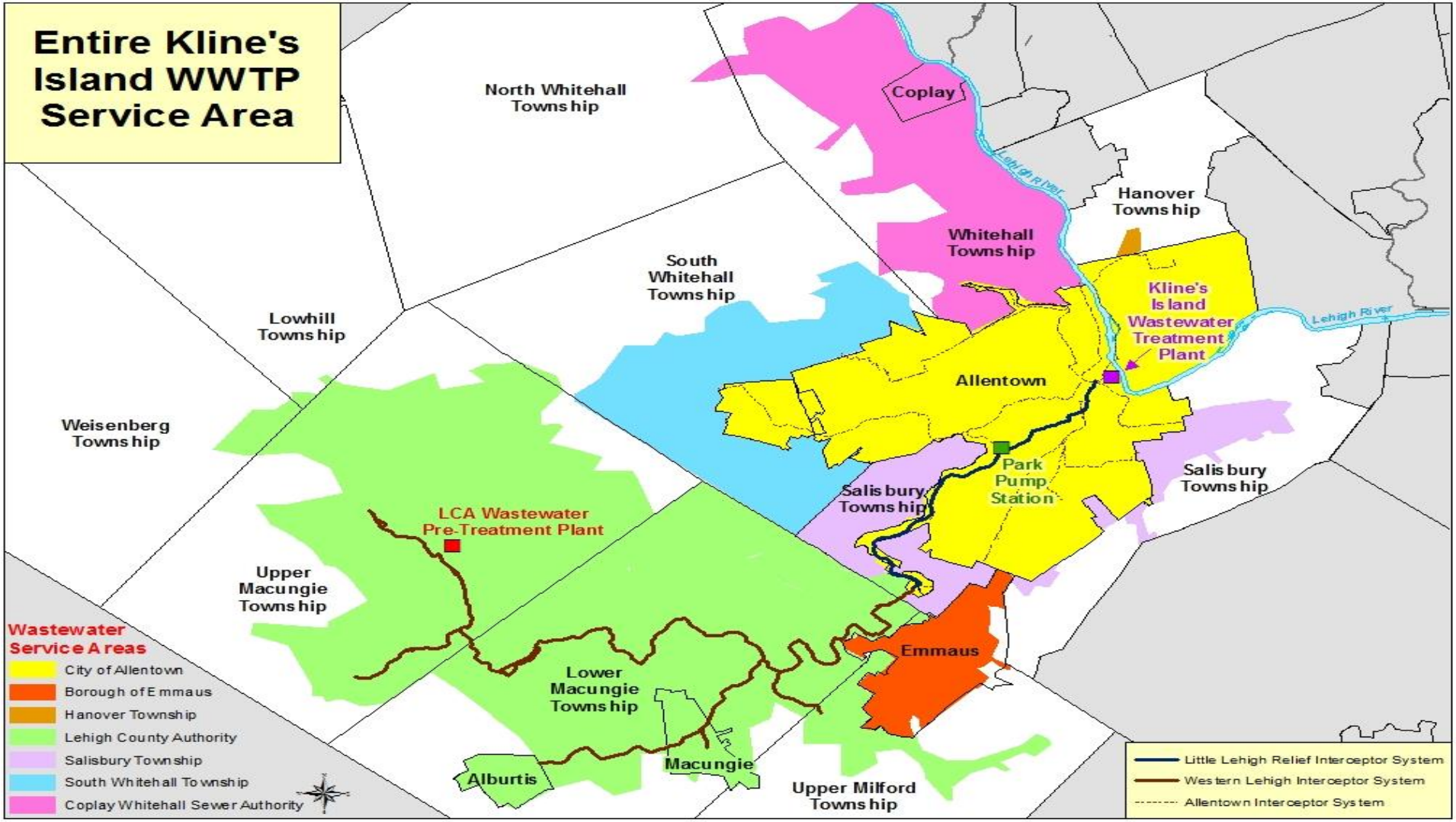

# Becoming Rainstorm Ready: An integrated approach to addressing wet-weather sewer overflows

# Purpose of Presentation

- Present holistic view of the planned approach to addressing EPA Administrative Order to eliminate sewer overflows
- Explain LCA's role in the process
- Share staff perspective on LCA position on "blending"
- Set LCA's priorities for participating in developing an integrated solution to the AO
- Discuss!


Entire Kline's Island WWTP Service Area
North Whitehall Township
Coplay
Lehigh River
Hanover Township
Whitehall Township
South Whitehall Township
Kline's Island Wastewater Treatment Plant
Lehigh River
Lowhill Township
Allentown
Weisenberg Township
Park Pump Station
Salisbury Township
Salisbury Township
LCA Wastewater Pre-Treatment Plant
Upper Macungie Township
Emmaus
Lower Macungie Township
Macungie
Alburtis
Upper Milford Township
Wastewater Service Areas
City of Allentown
Borough of Emmaus
Hanover Township
Lehigh County Authority
Salisbury Township
South Whitehall Township
Coplay Whitehall Sewer Authority
Little Lehigh Relief Interceptor System
Western Lehigh Interceptor System
Allentown Interceptor System

# Why does the sewer system overflow? INFILTRATION & INFLOW (I&I)

1. Infiltration – Groundwater entering the sewer pipes and/or manholes through defects and failed gaskets. On a normal dry day, depending on conditions, the system may receive 2-4 million gallons of groundwater every day (baseline infiltration)!

2. Inflow – Stormwater flowing directly into manholes and cleanouts.

3. Clearwater – Illegal connections such as roof drains, sump pumps, foundation drains and yard drains connected to sanitary sewer pipes. *

# *Homeowner / Private Property Issues & Hard Questions

- EPA estimates at least 50% of I&I comes from private property, including broken sewer laterals and unauthorized connections like sump pumps and roof drains.
- Municipalities may only be able to address a small portion of the problem through fixing the public portion of the system
- Typical sewer lateral replacement = $3000-6000
- Should municipalities pay and spread cost to all customers?

# Historical Artifacts Have an Impact:

- **Treatment System Design**
- **Sewer System Construction**
  - **Developer vs. Municipal Installations**
- **Building Codes / Enforcement / Inspections**
  - **Private Property**
- **Preventive Maintenance & Asset Management**
  - **Rate / political pressures**
- **Growth / Economic Development**
- **Municipal Ownership**

# Where Overflows Occur

"Outfall 003" at the Allentown treatment plant – discharges to Little Lehigh Creek approximately 100 yards upstream of confluence of Lehigh River.


Manholes along the Little Lehigh Creek and other locations in the system.

Basement backups when smaller lines are full or bottlenecks occur.

# EPA Recommends an Integrated Approach…


Source: EPA, 2014, “Blending and Wet Weather Operations: An Engineering Perspective”

# … so that's what we're doing!

LCA, Western Lehigh municipalities, City of Allentown, and others have developed an integrated program that addresses four primary goals:

- **Address the Root Cause** – Get the groundwater/rainwater out of the sewer system to reduce peak flows.

- **Build Network to Handle Peak Flows** – Expand capacity of the pipes and pumps to handle the peak flows so that overflows don't occur as the wastewater travels through the system to the Allentown treatment plant. New facilities to be sized appropriately for future planned growth.

- **Effective Treatment of Wastewater** – Add treatment facilities at the Allentown plant so that all peak flows receive treatment and all discharges meet permit requirements.

- **Ongoing Maintenance** – Proactively maintain the system moving forward to ensure proper operation.

# PHASE 1 – Focus on getting the leakage out of the sewer system (2018-2026):

- Municipal systems' I&I source remove program ($32M)
- LCA interceptor and Park Pump Station upgrades & rehabilitation ($10M)
- Trexlertown Interceptor rehab & expansion ($13M)
- City of Allentown treatment plant – 4 million gallon storage tank for wet-weather capacity or blending ($14M)
- Flow metering, recalibration of flow model & Phase 2 planning work ($1M)

# PHASE 2 – Sized according to Phase 1 results (2027-2040)

After we know how much leakage was removed…

- Park Pump Station expansion ($30M)
- Keck's Bridge Interceptor rehab & expansion ($5M)
- Alburtis-Macungie Trunk Line expansion ($13M)
- Ancient Oaks Interceptor expansion ($9M)
- City of Allentown wastewater plant wet-weather capacity expansion – flow equalization or blending ($89M)
- Long-term ongoing source removal program ($180M)

# Summary of all Goals:

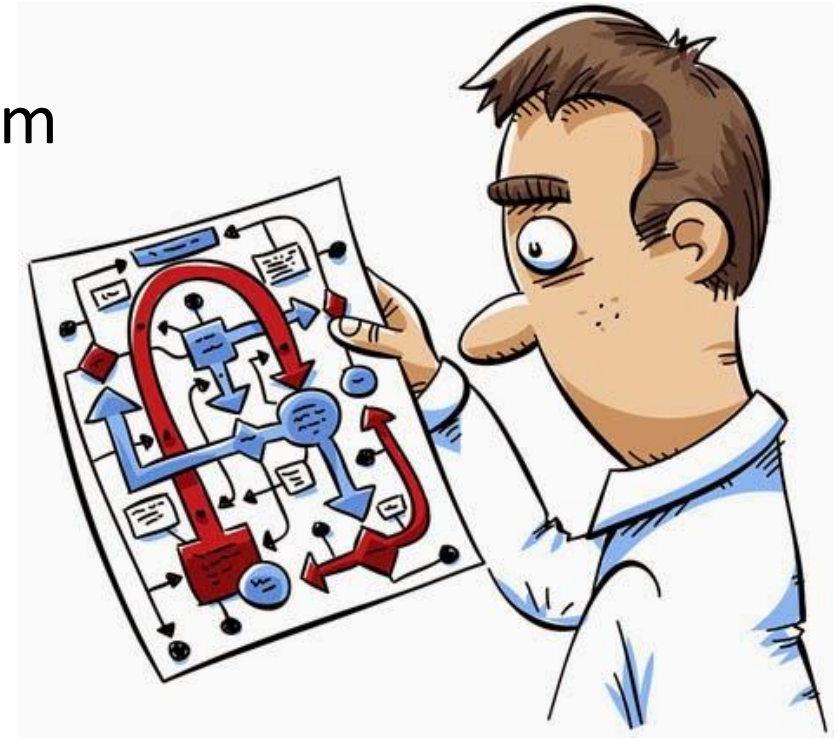
| | |
|---|---|
| Address the Root Cause | $ 32.0 Million |
| Build Network to Handle Peak Flows | $113.6 Million |
| Effective Treatment of Wastewater | $102.6 Million |
| Ongoing Maintenance | $180.0 Million |
| **Total Known / Estimated Costs:** | **$428.2 Million** |

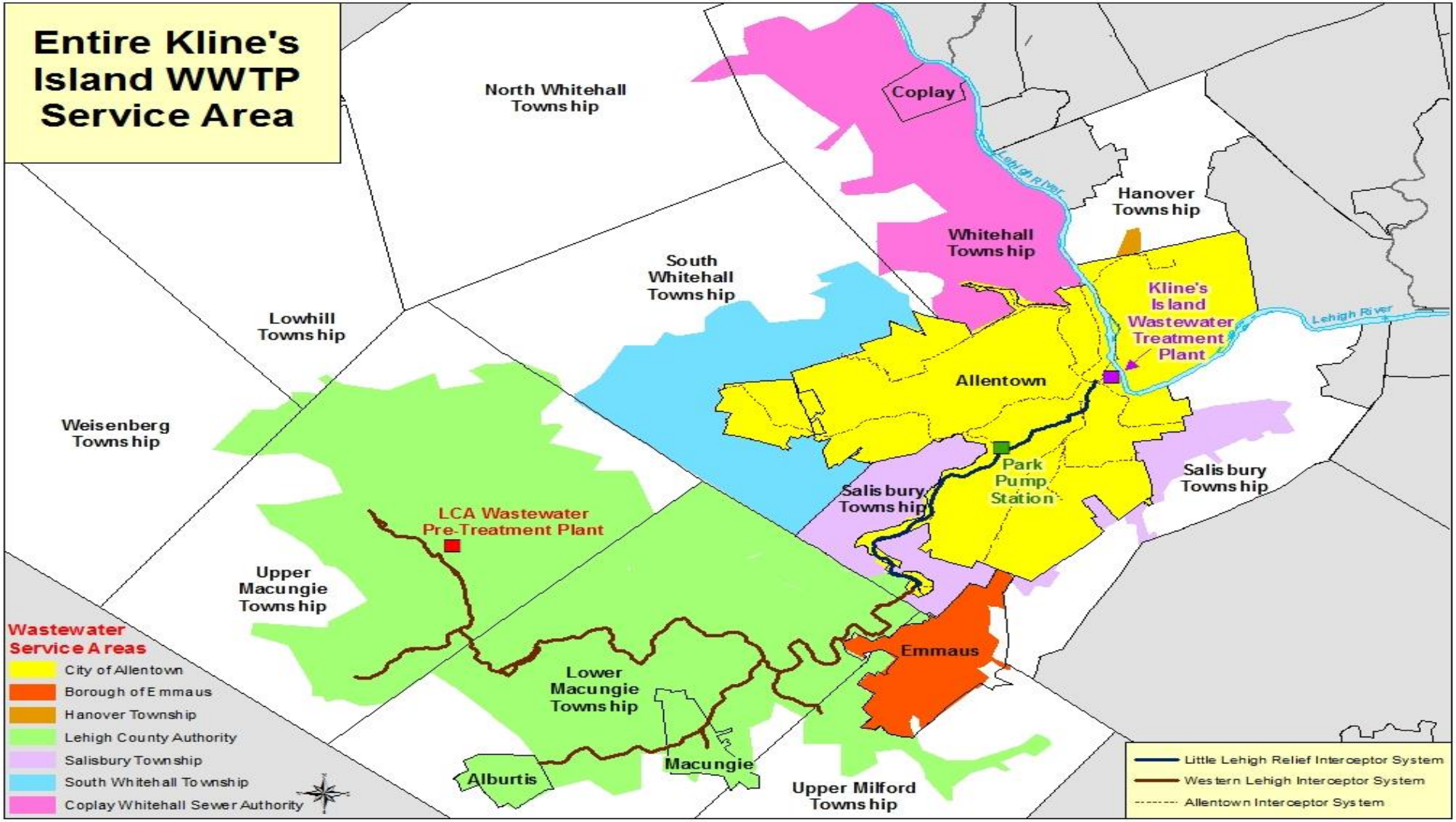
NOTE: Costs do not include I&I removal work by the City of Allentown, South Whitehall, Salisbury, Emmaus, Coplay-Whitehall or Hanover Township.

# Lehigh County Authority's Role?

It's complicated…

- We don't own much of the system
- What LCA does own is on behalf of our signatories
- We don't control growth & development
- All costs pass through LCA to others
- Lease of city system is complex
- Many look to LCA to provide leadership

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# Components of Allentown lease

- City retains responsibility for compliance with EPA Administrative Order
- City decides and pays for improvements to the system and wastewater plant to achieve compliance
- LCA implements improvements at the City's direction
- LCA operates the system and the wastewater plant
- LCA responsible for meeting permit requirements
- LCA responsible for meeting additional city lease requirements

# What about “Blending”?

Rumor has it…

*“LCA wants to dump raw sewage into the creek!”*

**Not true!**

**Raw Sewage: *Sewage that has not yet been processed or treated to separate and remove contaminants.***

Facts About Blending:

- First, it’s not LCA’s decision or plan, but our understanding is…

# What is “Blending”?

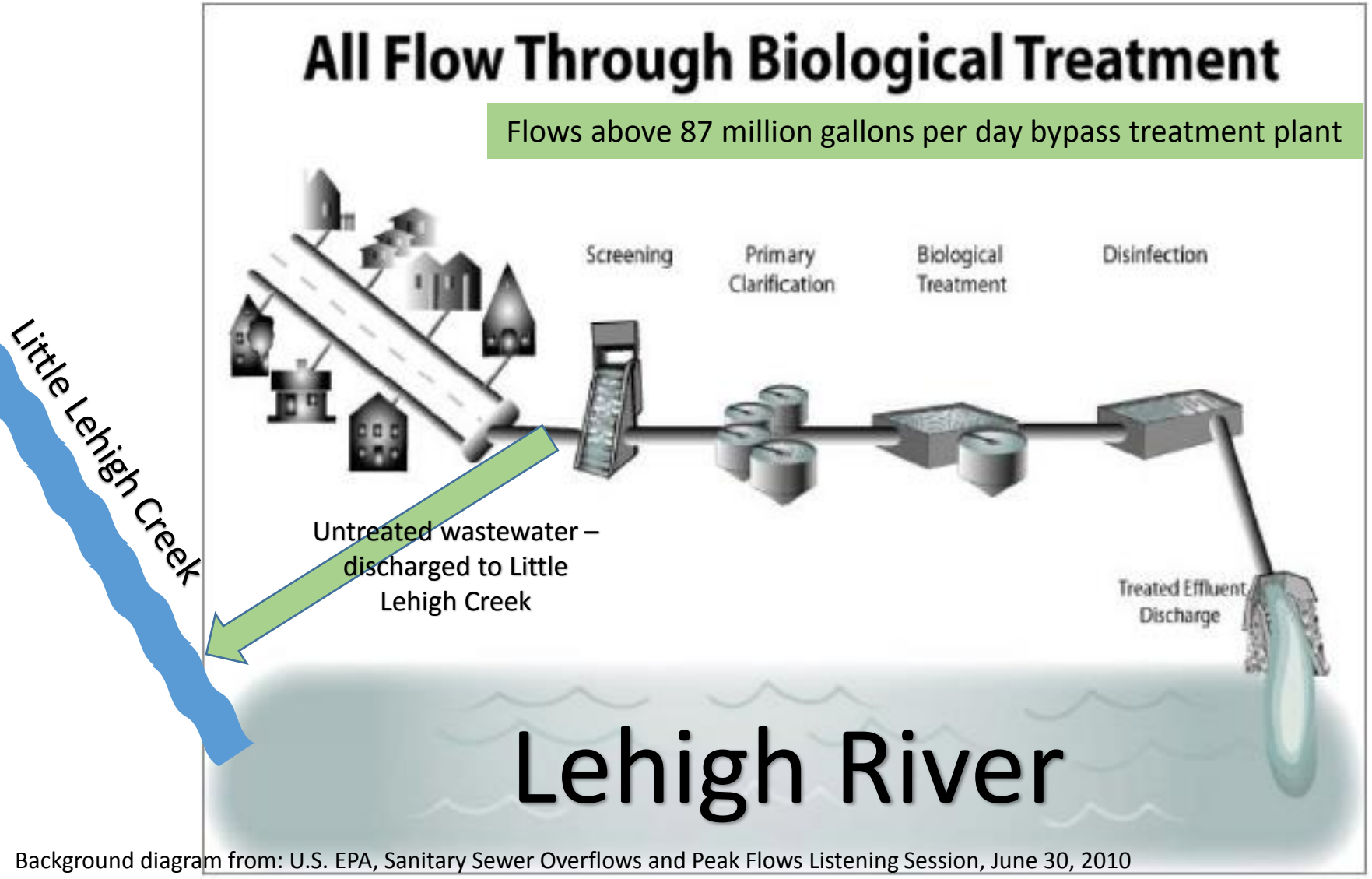
- Blending is a common engineering practice to address wet-weather flows across the nation, which regulators have approved / permitted (San Francisco, CA; Toledo, OH; Lawrence, KS)
- Blending would prevent raw sewage from being discharged. All wastewater would be treated and disinfected.
- If blending is permitted in Allentown, all discharges would be required to meet permit requirements.

EPA has produced some good diagrams to help explain…

# What happens today…


Background diagram from: U.S. EPA, Sanitary Sewer Overflows and Peak Flows Listening Session, June 30, 2010

# What happens today… during a storm




Background diagram from: U.S. EPA, Sanitary Sewer Overflows and Peak Flows Listening Session, June 30, 2010

# How blending works


Background diagram from: U.S. EPA, Sanitary Sewer Overflows and Peak Flows Listening Session, June 30, 2010

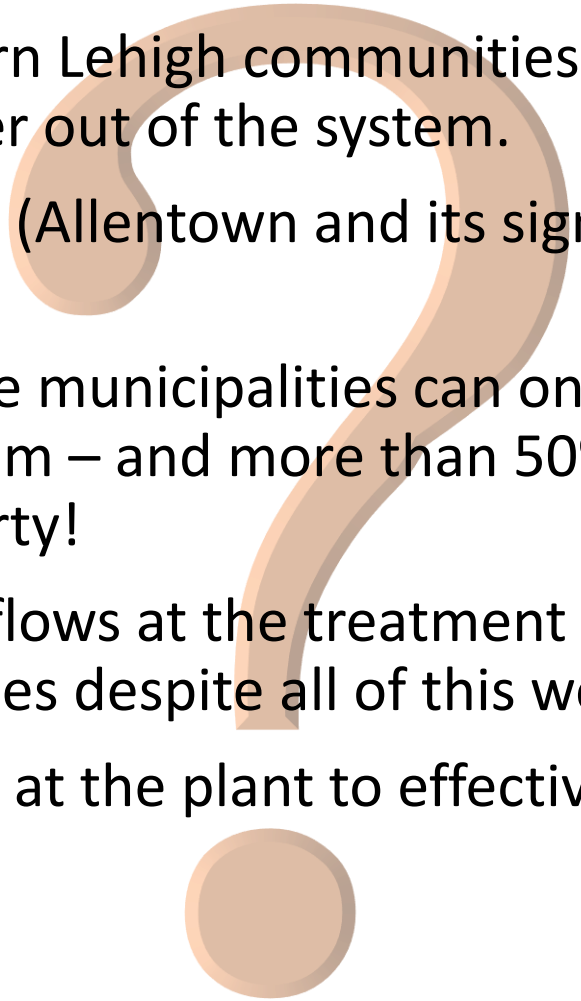
# The alternative to blending: Flow Equalization

# Flow Equalization

- Divert peak flows into large tanks for treatment later
- Can be operationally and environmentally problematic:
  - Odor / pest / mosquito control
  - Potentially higher electric use for pumping
  - Wet-weather capacity is limited to the size of tanks that can be built -- additional wet-weather flow would be discharged to the environment without treatment
  - Back-to-back storms cannot be addressed if tanks are full
  - Huge real estate requirements on a limited parcel
  - Significant earth-moving requirements in a sensitive environmental area
- In-stream water quality not measurably different than other alternatives
- Will also meet permit requirements, subject to limitations noted above
- More expensive, but it will work in most conditions

# Why do any of this?

*Shouldn't we just focus on addressing the root cause of the problem?*



- LCA and the Western Lehigh communities will spend $212 million to remove rainwater out of the system.
- Other communities (Allentown and its signatories) must do their part as well.
- But remember… the municipalities can only address the public portion of the system – and more than 50% of the problem comes from private property!
- Peak wet-weather flows at the treatment plant will continue for many years / decades despite all of this work.
- We <u>need</u> a solution at the plant to effectively treat the peak flows!

# Why does LCA care?

- We represent 7 municipal signatories and Boston Beer in Western Lehigh County – they pay for this work, not LCA
  - Costs pass through LCA to the signatories / customers
  - LCA's fiduciary responsibility is to represent the signatories
  - City decides about blending / other wet-weather improvements
- But LCA does care because:
  - As the plant operator, LCA must meet permit requirements
  - LCA must meet more stringent lease requirements
  - LCA bears a portion of ongoing operating costs of the city plant
  - LCA cares about the rate impact to the communities we serve, and their customers
  - LCA cares about eliminating overflows and improving environmental quality

# LCA Position:
# Keep blending on the table

- Current engineering shows:
  - Blending will be effective in meeting permit requirements
  - In-stream water quality not measurably different than other alternatives
  - Construction of blending facilities will cost $37 million less than other alternatives
  - Blending is operationally and environmentally favorable
- It's worth continuing to explore until it is resolved from a regulatory / legal viewpoint
- LCA is responsible for representing our signatories' interests – they want the City to pursue blending

# The Holistic View

- Any changes / improvements at the Allentown treatment plant will be “end of pipe” solutions that have very little impact on resolving the overall problem of sewer overflows to the Little Lehigh Creek – it is a small piece of the puzzle.

- Much more work is needed “upstream” in the system to reduce peak flows and to eliminate bottlenecks that lead to overflows in the Little Lehigh Creek.

- An integrated approach is required!

# The ultimate goal of an integrated approach…
# What we're trying to protect!

# LCA Priorities to Provide Leadership

- Work with our municipal signatories to develop a cost-effective, thoughtful and integrated program to comply with the AO – plan submission required by 12/31/17
- Evaluate and recommend cost-sharing options
- Facilitate our municipal signatories' efforts to reduce wet weather flows through their source removal programs
- Maintain and enhance our own portion of the system – the regional interceptors and pump stations – to meet the current and future needs of our signatories
- Represent our municipal signatories' interests as Allentown pursues improvements at the treatment plant
- Facilitate collaboration between the City and its signatories
- Help our signatories communicate effectively with the public about rate impacts and property owner responsibilities
- Operate the Allentown system in a cost-effective manner that meets all regulatory and lease requirements


# Discussion / Questions