



# Kline's Island Sewer System

## Regional Sewer Plan

**Update to Lehigh County Authority Board of Directors**

January 13, 2025

# The time is now

Most components of the KISS were built in 1920s through the 1980s.

Past generations invested heavily in creating the system that supports the quality of life we enjoy today.

It is time to reinvest – to ensure these benefits continue for our region’s future.

KISS municipal leaders have been working on sewer planning for many years – **now is the time to finalize our plans and get started.**



# KISS Service Area

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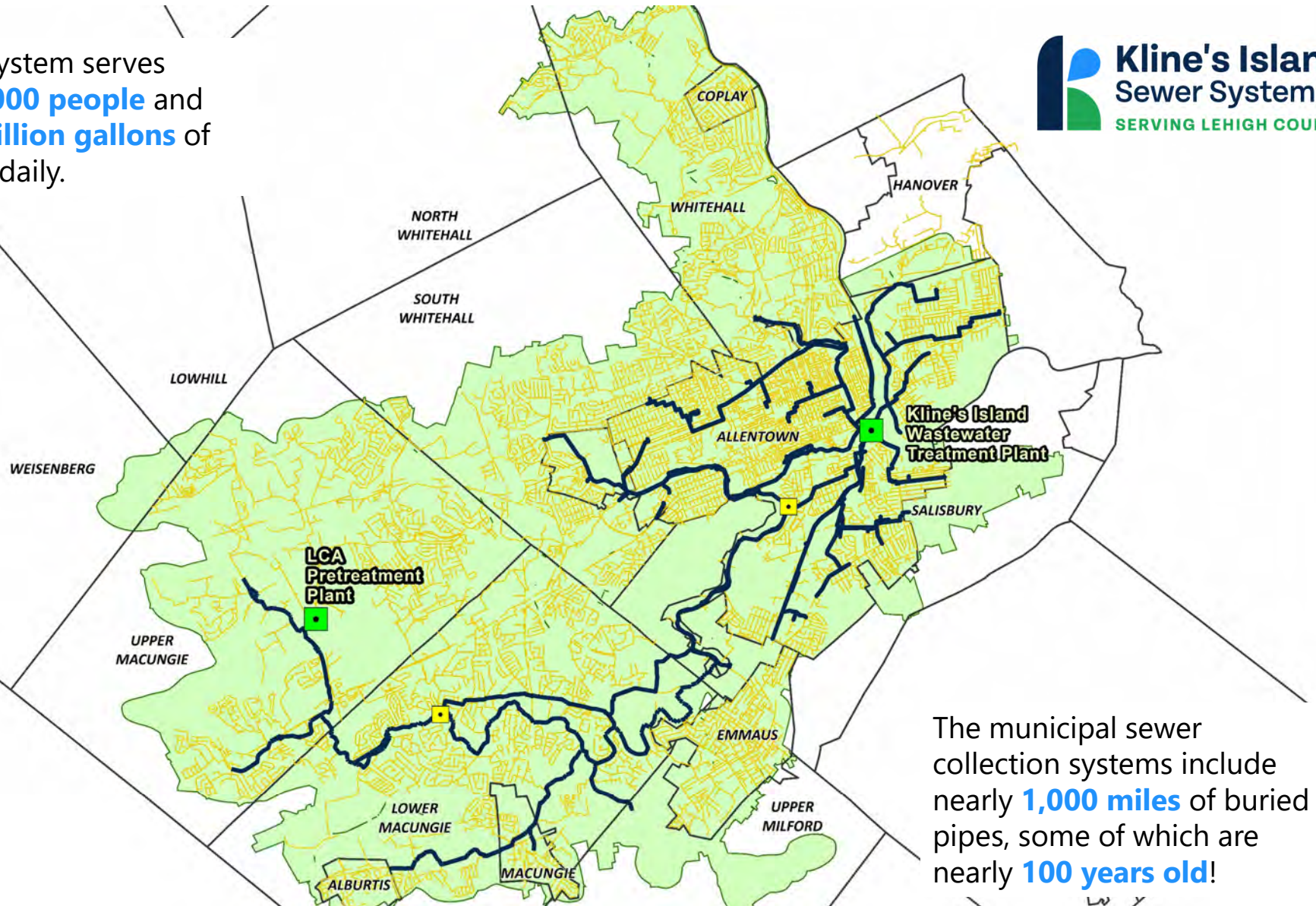
1. City of Allentown
2. Borough of Emmaus
3. Borough of Macungie
4. Borough of Alburtis
5. Borough of Coplay \*
6. Upper Macungie Township
7. Lower Macungie Township
8. South Whitehall Township
9. Salisbury Township
10. Whitehall Township \*
11. Upper Milford Township \*\*
12. Hanover Township
13. North Whitehall Township \*
14. Weisenberg Township \*\*
15. Lowhill Township \*\*

\* The Borough of Coplay, Whitehall Township, and North Whitehall Township receive sewer service through an agreement with the Coplay-Whitehall Sewer Authority.

\*\* Lehigh County Authority (LCA) owns and operates the sewer systems serving Upper Milford, Weisenberg, and Lowhill townships.



The sewer system serves about **270,000 people** and treats **32 million gallons** of wastewater daily.



The municipal sewer collection systems include nearly **1,000 miles** of buried pipes, some of which are nearly **100 years old!**

# Complex Relationships & Old Agreements!

## **LCA Owns:**

- Pretreatment Plant
- Western Lehigh Interceptor
- Park & Spring Creek Pump Stations
- Little Lehigh Relief Interceptor
- Weisenberg, Lowhill & Upper Milford sewer collection systems

## **City Owns:**

- Kline's Island WWTP
- Little Lehigh Interceptor
- Various other interceptors
- City sewer collection system
  
- LCA operates City-owned system under 50-year lease agreement

**Municipalities Own:** Collection systems & pump stations



## Meet LCA

We...

- Manage the system's regional components (treatment plants, interceptors, pump stations)
- Operate some municipal systems directly
  - Allentown, U. Milford, Weisenberg, Lowhill
- Administer municipal cost-sharing agreements
- Work closely on this plan with all municipalities
- Focus on meeting DEP's Act 537 requirements
- Will implement the regional projects





# Pretreatment Plant (PTP)

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1980s Goal: Centralize pretreatment & support growth in region

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Constructed by County of Lehigh in 1990

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Transferred to LCA in 2009 debt-free, but with restrictive operating & customer agreements in place

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Major capital investment needed to upgrade and expand, with few options for cost recovery

The PTP has been successful in attracting and fostering a highly concentrated food and beverage manufacturing industry in our region.

## The Economic Value of the PTP \*



**22** businesses served



**11** industries covered



**2,950** workers employed



**\$253 million** annual earnings

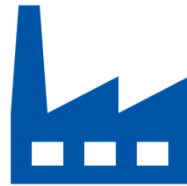
\* Economic Contribution Analysis by AECOM, using 2022 data.



# Three major challenges



Pretreatment Plant at end of its useful life – major replacement needed



Limited / no remaining capacity available for new industrial growth



No financial mechanism currently in place to capture capital costs

**Current Solution Under Development: Smaller project focused on needs of specific current industries.**

# Kline's Island Sewer System (KISS) Faces Major System Challenges



## Aging Infrastructure

Most KISS communities struggle with deteriorating infrastructure that is 50 to 100 years old, causing leakage and sewer overflows



## Size of Existing Infrastructure

Our infrastructure is not designed for wet weather events that leak rainwater into the system, making sewer overflows worse



## Capacity for New Connections

Many system components are at capacity today, regardless of the wet weather challenges, stalling potential economic development and growth



## Regulatory Oversight

System overflows and permit violations have increased regulatory oversight, restricted new connections, compelling us to take action





# Inflow and Infiltration

Our hydraulic model shows that **160 million gallons of water per day** enter the sewer system during wet weather.

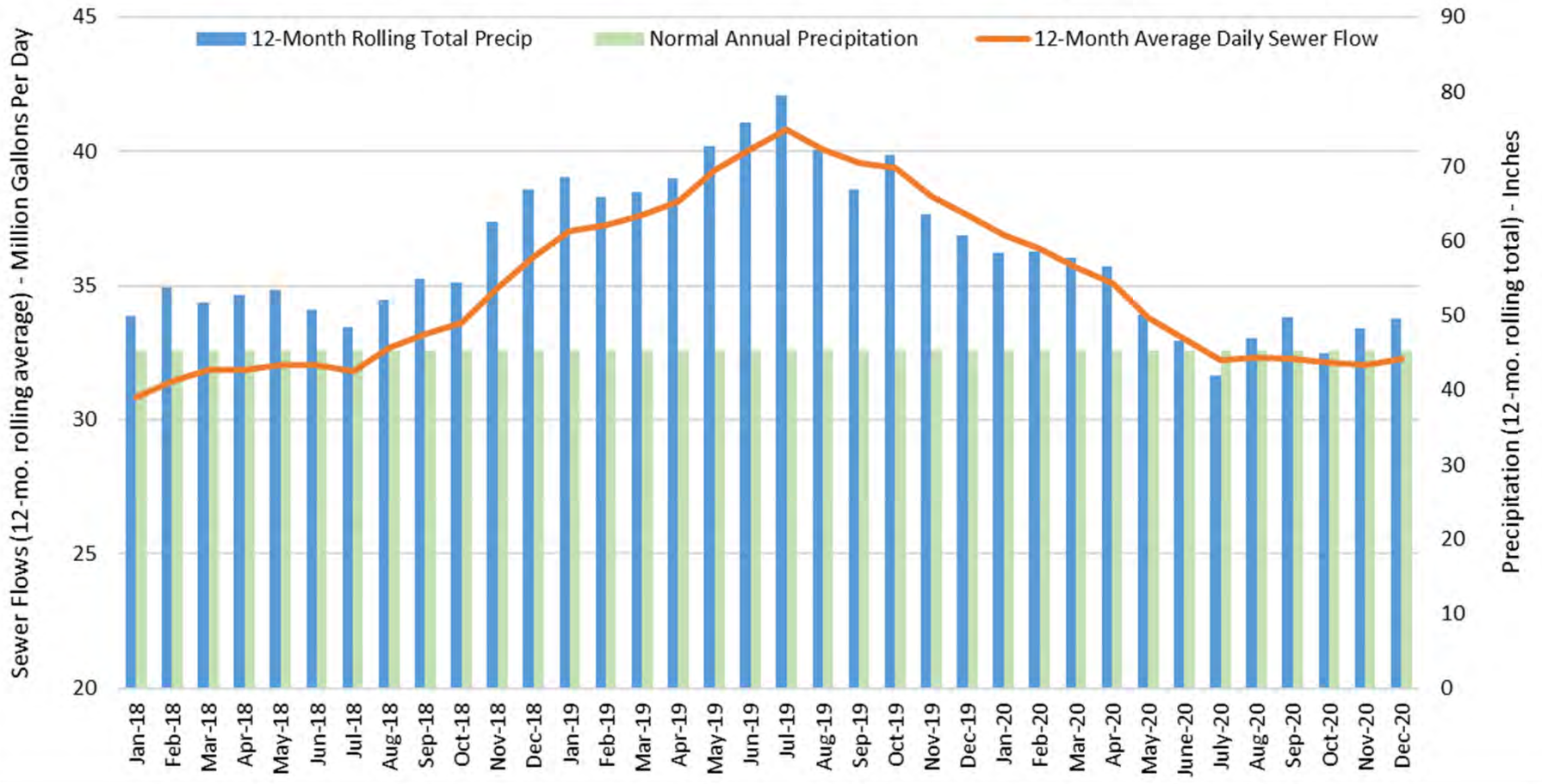
The treatment plant can only process about half of that. When there's no place for the water to go, overflows happen.

And when it's not raining, nearly **10 million gallons of water** enters the system every day through leaking pipes.





### 12-Month Rolling Totals - Sewer Flows vs. Precipitation



# Regulatory Action: A Brief Overview

## Administrative Orders

2007 – 2009

U.S. EPA issues Administrative Orders (AOs) due to excessive sanitary sewer overflows and plant bypasses during wet weather

## Wet Weather

2018 - 2019

Wet weather makes it clear the system needs significant investment

## DEP Corrective Action

2019

System overload triggers corrective action with DEP, new connections limited until Act 537 Plan developed

2007 - 2017

2018 - 2019

2020 - 2025

## Regional Collaboration

2009 – 2018

In response to AOs, some municipalities begin working together on regional sewer monitoring, with increased collaboration over time

## Administrative Orders Lifted

2019

In response to regional collaboration, AOs are lifted, and oversight is transferred to the Pa. DEP

## Act 537 Planning

2020 - 2025

DEP requires Act 537 Plan to be submitted by 2025, including solutions to overflows and plans to address long-term needs

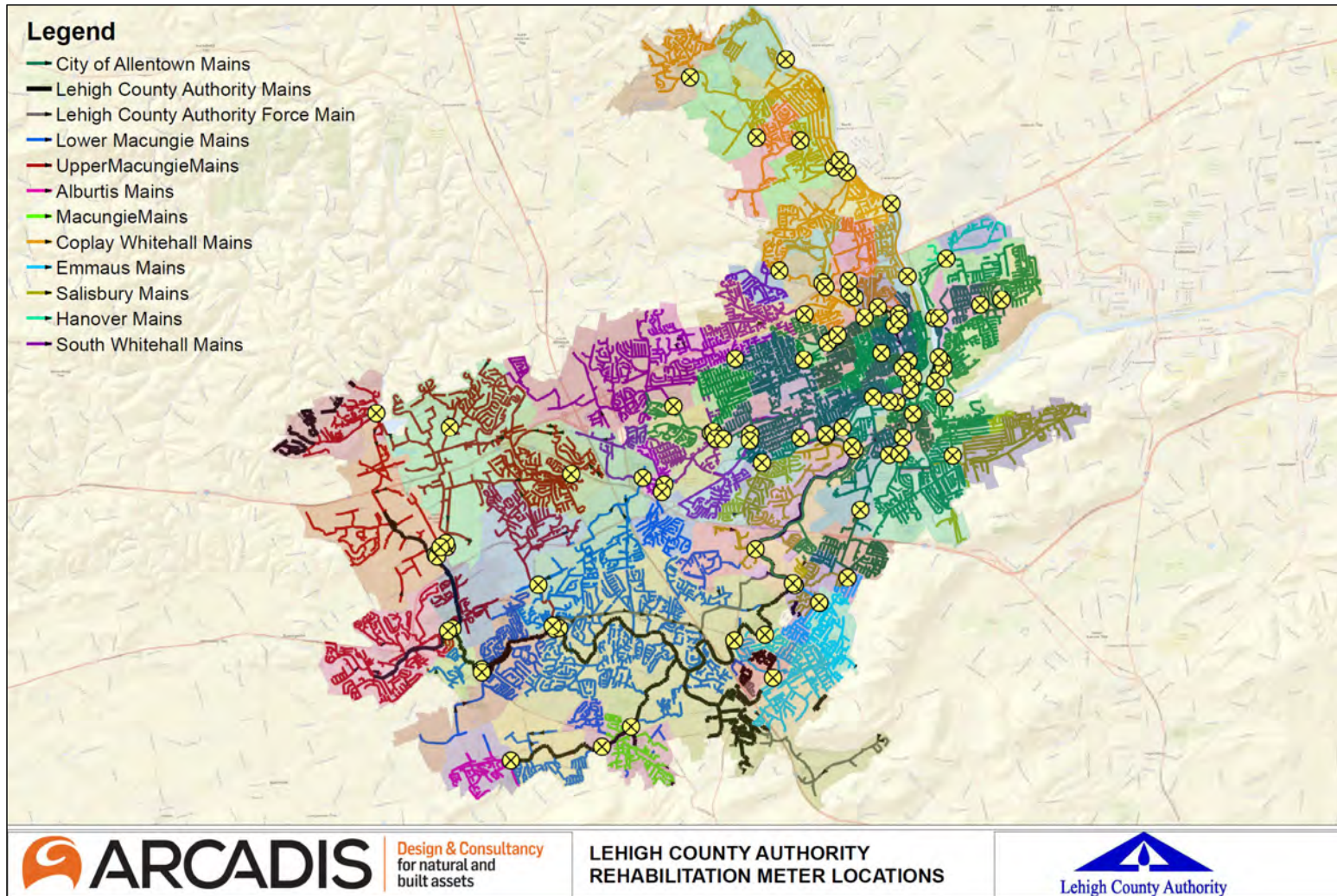
# Overarching Interrelated Challenges

## Aging System $\leftrightarrow$ Growing System

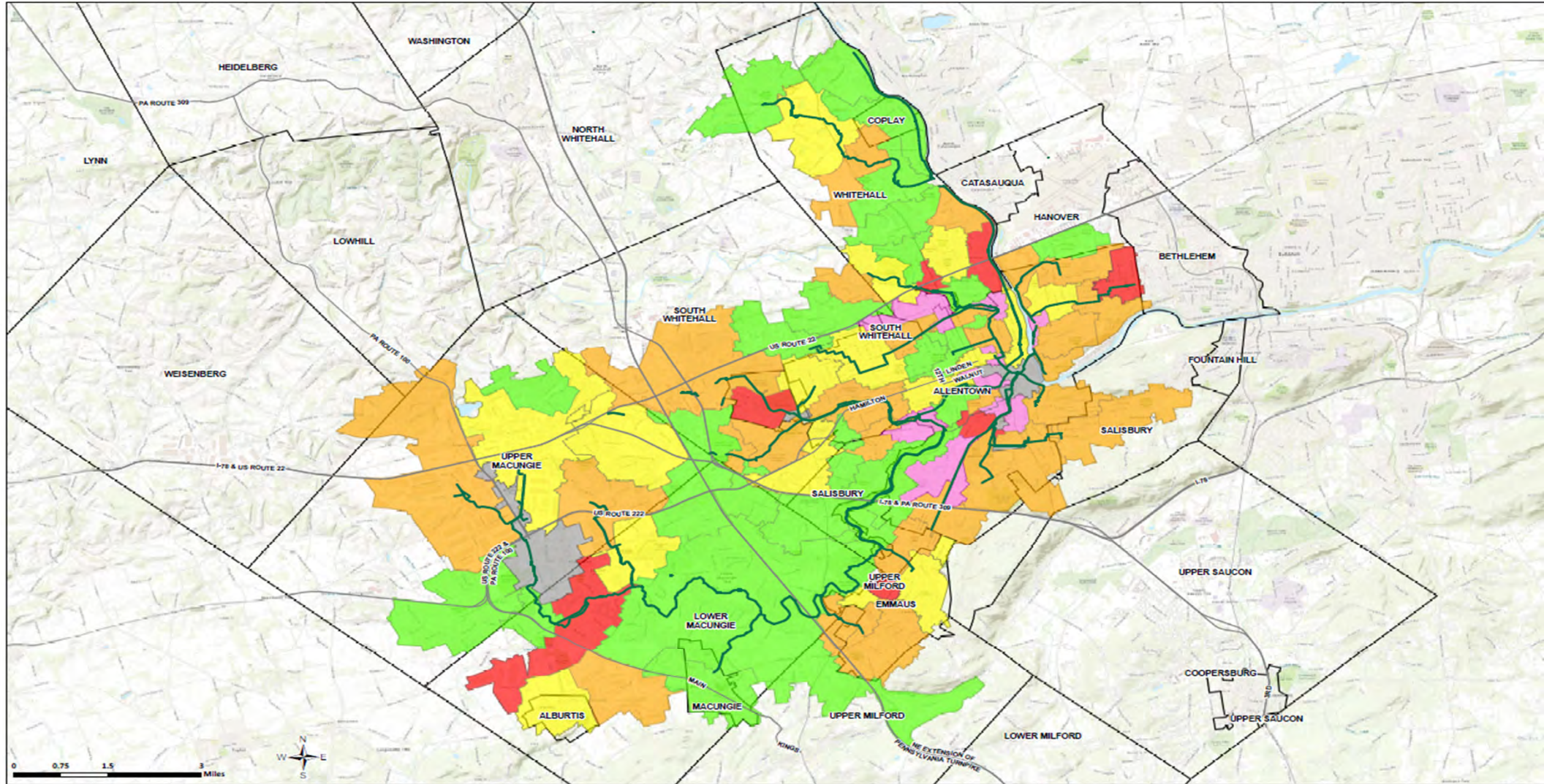
- SSOs & plant bypasses
- System bottlenecks & undersized interceptors
- Adequate dry-day treatment capacity (a good thing!)
- Mismatched intermunicipal agreements
  - › Cost-sharing
  - › Treatment allocation
- Near-constant development pressure!



# 2021 Flow Monitoring – Meter Locations







**Length Normalized RDII (GPD/LF)**

<span style="color: green;">■</span> < 2	<span style="color: red;">■</span> 8 - 15	<span style="color: green;">—</span> Interceptor Main 18" and Over
<span style="color: yellow;">■</span> 2 - 4	<span style="color: pink;">■</span> > 15	
<span style="color: orange;">■</span> 4 - 8	<span style="color: gray;">■</span> No Study Conducted	

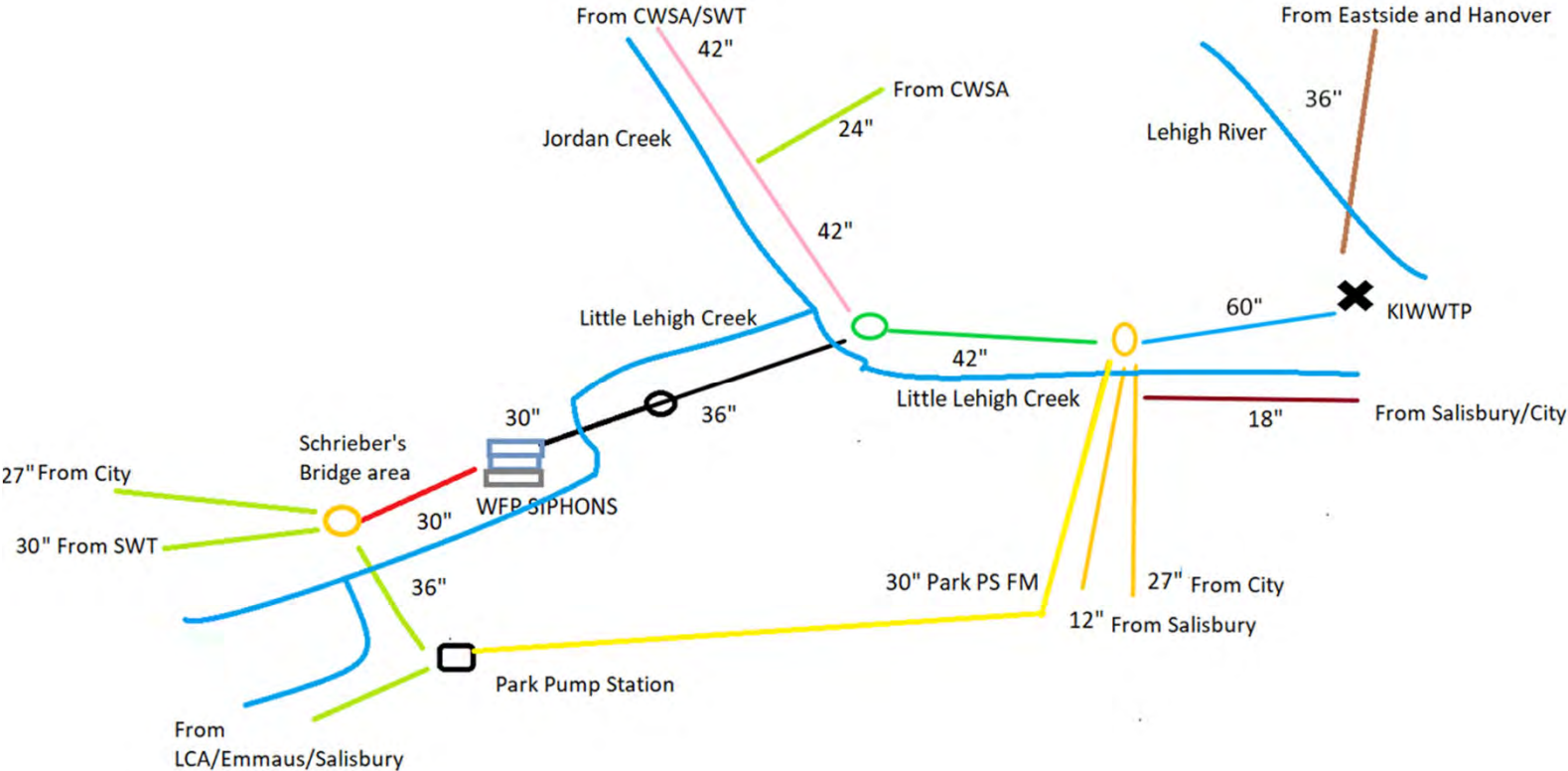
LEHIGH COUNTY AUTHORITY  
**KISS I&I SUMMARY**  
 LEHIGH COUNTY, PENNSYLVANIA

Remarks:  
 I&I studies were not able to be conducted in gray boundary areas

**LEHIGH COUNTY AUTHORITY  
 GIS**  
 DATE: 4/5/2022      SCALE: 1:44,000  
 CREATED:              CHECKED:

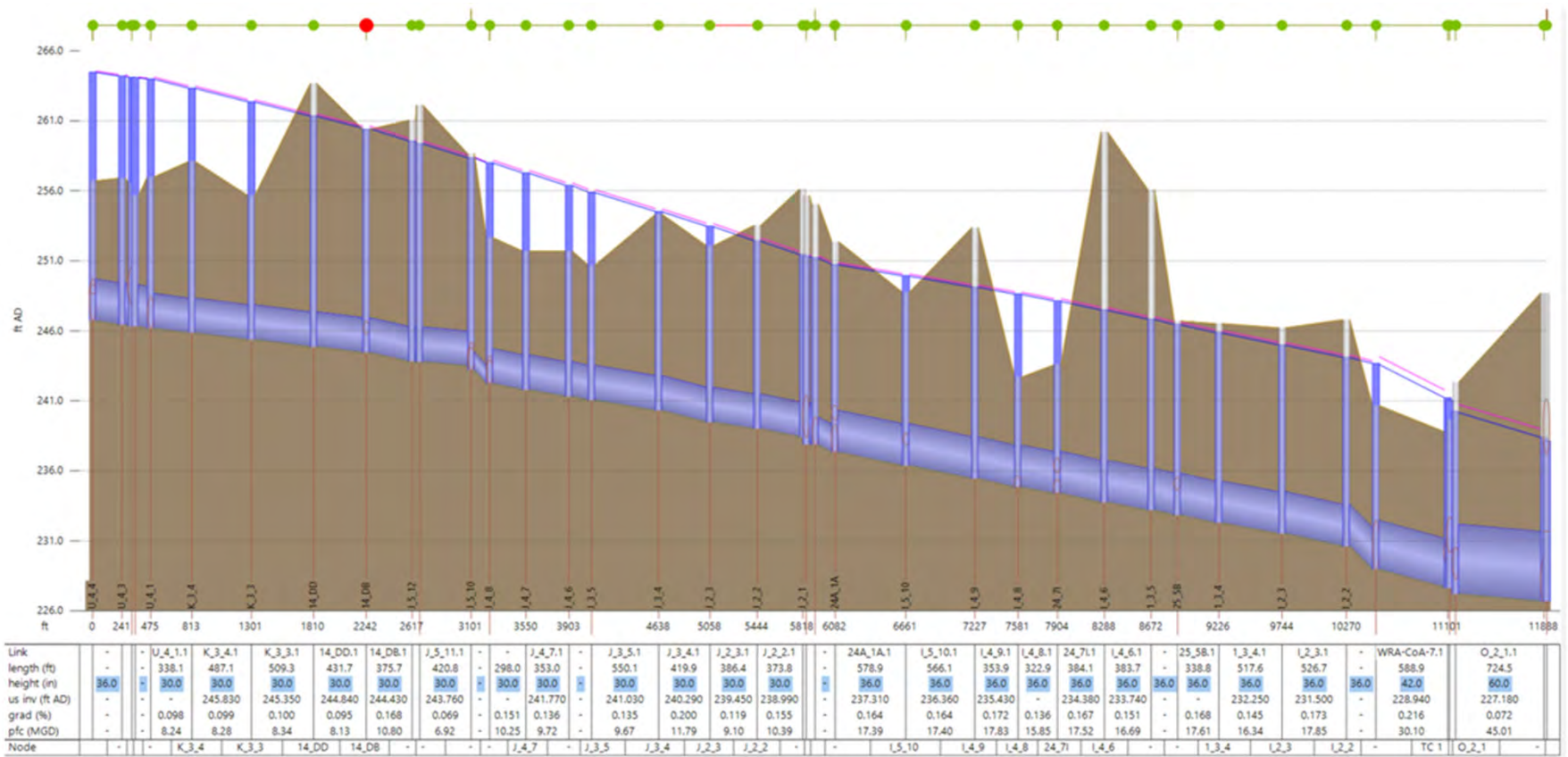
# Kline's Island WWTP Upstream Piping Schematic

This piping arrangement limits peak flows to KIWWTP at ~105 MGD

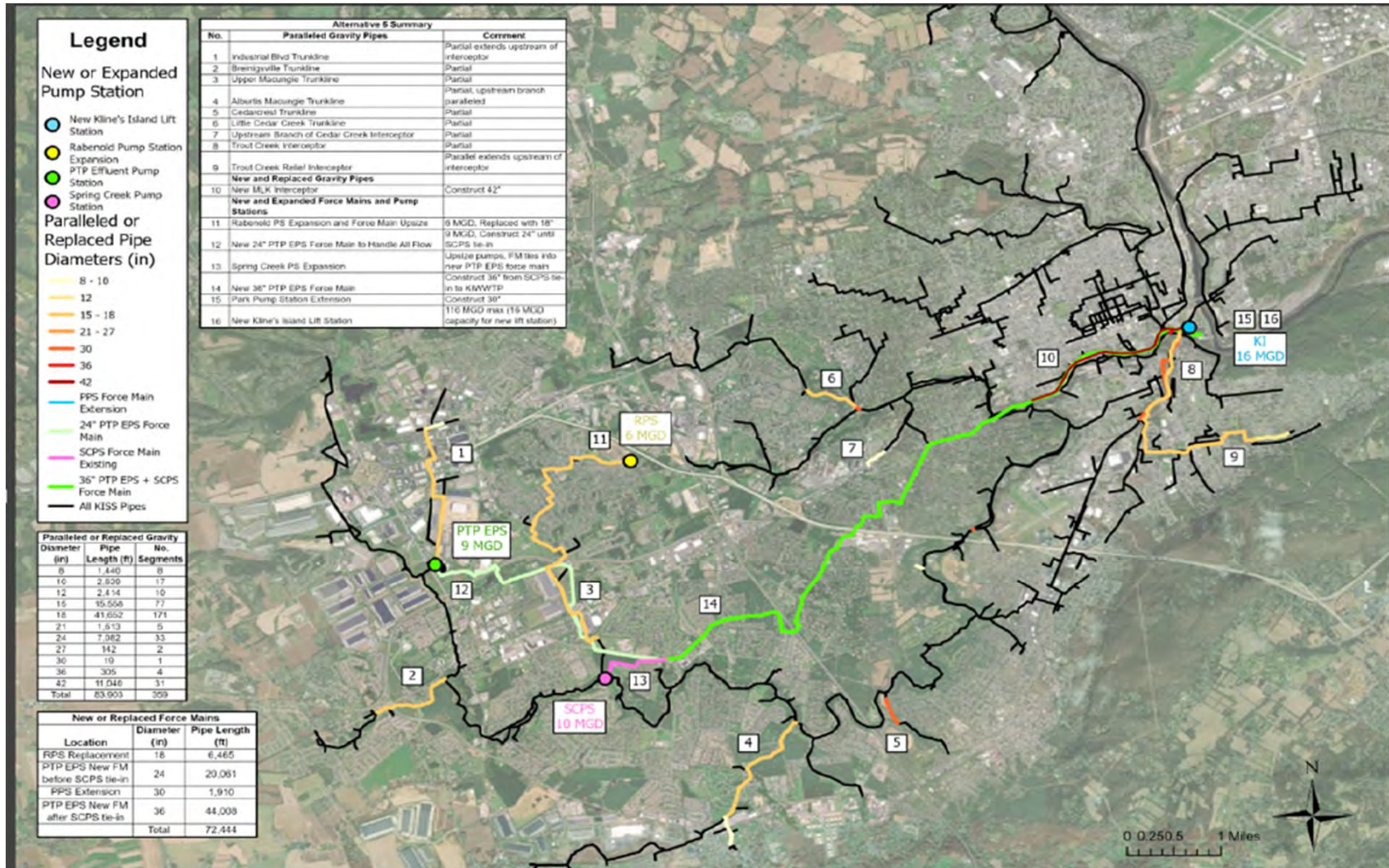




# HGL from Water Plant to KIWWTP

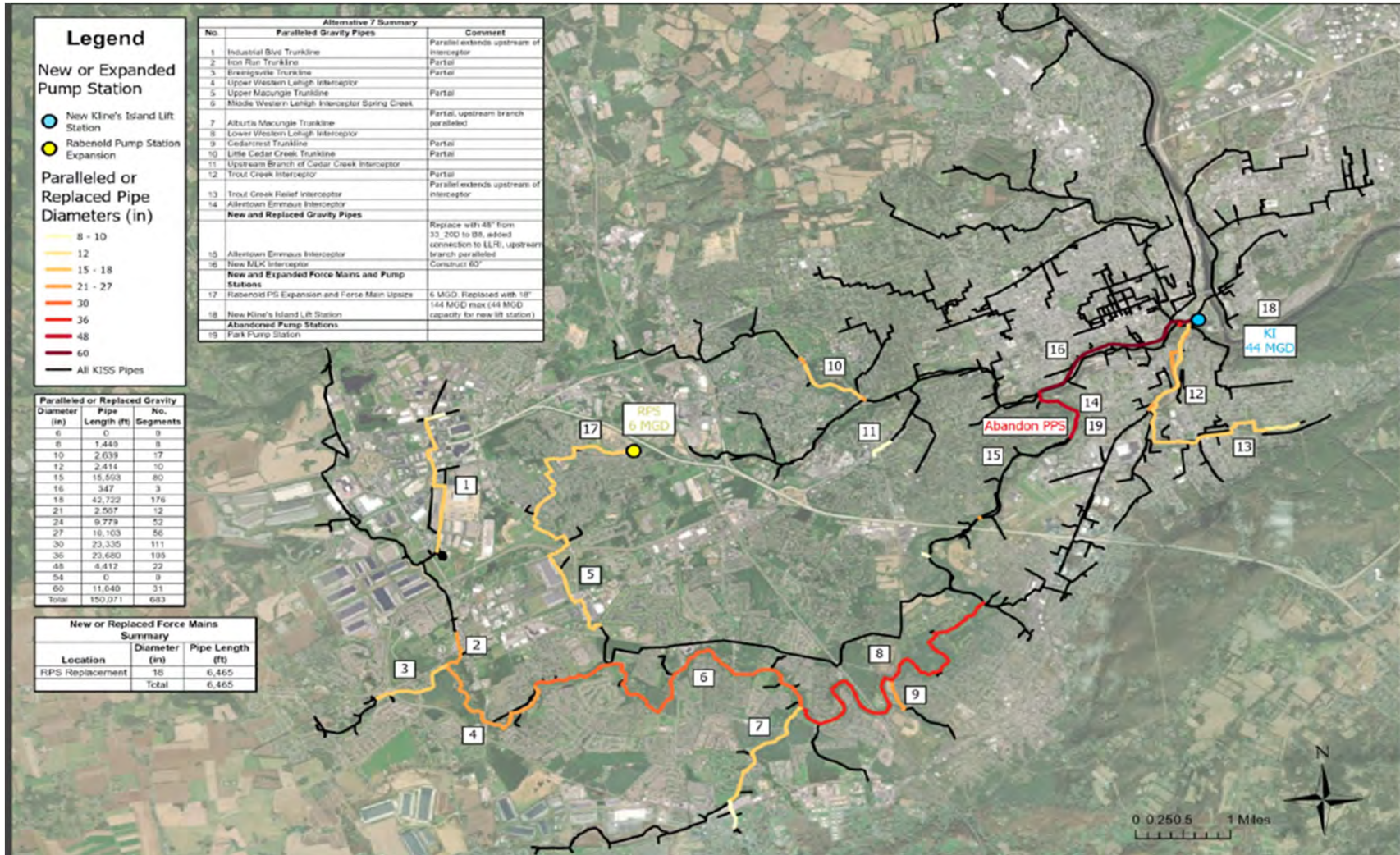


# Alternative 1: Upgrade Pretreatment Plant to Full Treatment





# Alternative 2: Expand Existing Facilities





# Major Alternatives Reviewed

## 1. Pretreatment Plant Conversion

- Upgrade pretreatment plant to full treatment
- Create new discharge point
- Divert XX MGD from KISS to new discharge point
- Reduce downstream investments needed

## 2. Expand Existing Infrastructure

- Upgrade Kline's Island to handle wet-weather flows
- Expand interceptors to remove bottlenecks
- Address pretreatment needs separately / directly with industries
- Reduce inflow & infiltration

# 10-Year Summary of Improvements & Costs

Plan Component	Cost Estimate
Municipal Sewer Rehabilitation Programs (now – 2035)	\$80 – \$100 million
Kline’s Island Wastewater Treatment Plant (now – 2035)	\$70 – \$90 million
KISS Relief Interceptor (2030)	\$23 – \$30 million
Western Lehigh Relief Interceptor (2030+)	\$76 – \$98 million
<b>TOTAL 10-YEAR COST ESTIMATE</b>	<b>\$249 – \$318 million</b>

**Other Potential Projects:**

*Other Municipal Interceptors*

*TBD if needed*

*Pretreatment Plant*

*Cost under review w/ industries*

# KISS Act 537: 5-Year Plan

Plan Component	Cost Estimate
Municipal Sewer Rehabilitation Programs	\$55 – \$60 million
Kline’s Island Wastewater Treatment Plant	\$60 – \$65 million
Proposed Relief Interceptor	\$0 million
Western Lehigh Interceptor System	\$8 – \$10 million
<b>TOTAL ACT 537 PLAN COST ESTIMATE</b>	<b>\$123 – \$135 million</b>

## ***Other Potential Projects:***

*Other Municipal Projects*

*TBD if needed*

*Pretreatment Plant*

*Cost under review w/ industries*

# Projected 5-Year I&I Source Reduction Program Costs

Customer - Total	Total	%	2026	2027	2028	2029	2030
Alburtis - Total	-	0.0%	-	-	-	-	-
Macungie - Total	-	0.0%	-	-	-	-	-
Upper Macungie - Total	3,750,000	7.1%	1,000,000	1,000,000	750,000	750,000	250,000
Lower Macungie - Total	7,500,000	14.2%	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000
Lowhill - Total	-	0.0%	-	-	-	-	-
Weisenberg - Total	-	0.0%	-	-	-	-	-
Upper Milford - Total	200,000	0.4%	200,000	-	-	-	-
City of Allentown - Total	26,500,000	50.3%	5,000,000	5,000,000	5,250,000	5,250,000	6,000,000
Hanover - Total	15,000	0.0%	15,000	-	-	-	-
Emmaus - Total	1,620,000	3.1%	575,000	-	180,000	550,000	315,000
Salisbury - Total	2,000,000	3.8%	400,000	400,000	400,000	400,000	400,000
South Whitehall - Total	2,700,000	5.1%	540,000	540,000	540,000	540,000	540,000
North Whitehall - Total	-	0.0%	-	-	-	-	-
Coplay - Total	-	0.0%	-	-	-	-	-
Whitehall - Total	1,160,000	2.2%	25,000	25,000	370,000	370,000	370,000
LCA - Total	7,230,000	13.7%	250,000	3,000,000	3,000,000	300,000	680,000
<b>TOTAL</b>	<b>52,675,000</b>	<b>100%</b>	<b>9,505,000</b>	<b>11,465,000</b>	<b>11,990,000</b>	<b>9,660,000</b>	<b>10,055,000</b>

*Note: City MH inspection/rehab program is not included above  
(handled elsewhere in the Raftelis model)*



# Open Questions Remain

## Aging System ↔ Growing System

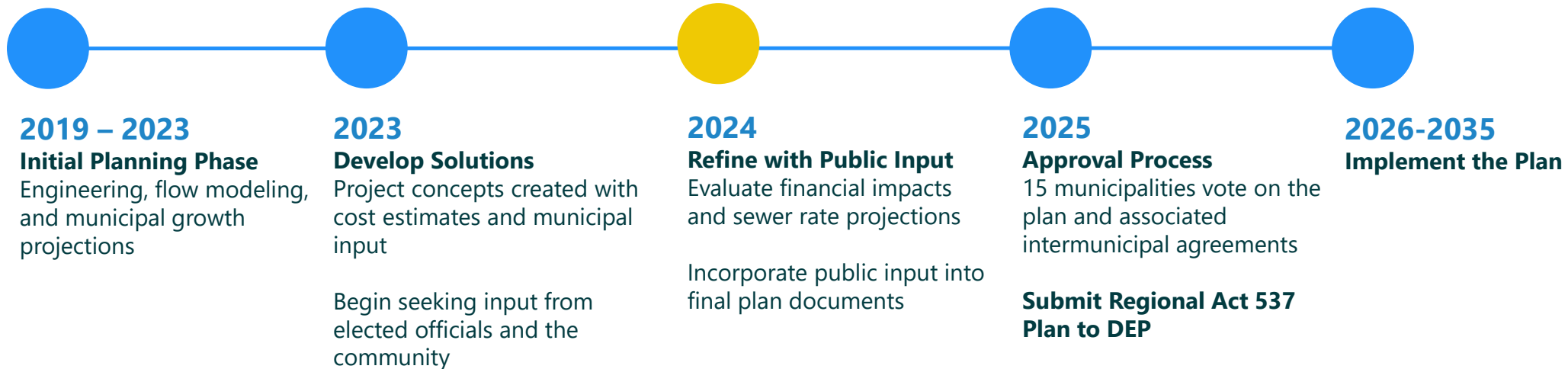
- ✓ SSOs & plant bypasses
- ✓ System bottlenecks & undersized interceptors
- ✓ Adequate dry-day treatment capacity

- Mismatched intermunicipal agreements
  - › Cost-sharing
  - › Treatment allocation
- Near-constant development pressure!



# Act 537 Plan Timeline

2019 - 2035



# Act 537 Plan Review & Approval Process – DRAFT Timeline

Action Steps	Start Date	End Date	# of Days
Final Draft of Act 537 Plan	Ongoing	3/14/2025	n/a
Planning Commission / Agency Review	3/14/2025	5/15/2025	62
Responses to Planning Review Comments	5/15/2025	5/31/2025	16
Publication / Advertisement Date	6/2/2025	6/2/2025	0
Public Comment Period	6/2/2025	7/2/2025	30
Responses to Public Comments	7/3/2025	7/18/2025	15
Final Act 537 Plan Delivered to Municipalities	7/18/2025	7/18/2025	0
Municipal Adoptions by Resolution	7/18/2025	8/29/2025	42
Compiling Documents	8/29/2025	9/15/2025	17
Submission to DEP	9/15/2025	9/15/2025	0
<b>Municipal Review / Approval Process</b>			<b>182</b>

# This Plan is an Investment

To complete work through 2035, we estimate project costs to be **\$300 million**.

This is the largest ever investment our region has made in protecting public health and safeguarding the environment.

Our region's quality of life, clean water ways, and future generations are relying on us to make these investments now.







# Open House Series: October 2024

1. Brief presentation & Q&A
2. Information stations to learn more
  - › KISS Challenges
  - › What is I&I?
  - › Financing the Plan
  - › LCA Overview
  - › Public Input



# Discussion / Questions

**Learn More:** [lehighcountysewer.org](http://lehighcountysewer.org)