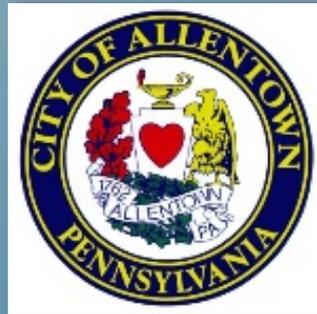


# EPA Administrative Order Status Update



City of Allentown

November 9, 2016



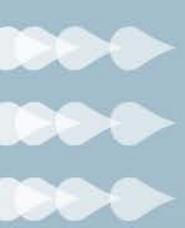
# Absolutely and Unequivocally

Blending will NOT result in the discharge of raw sewage into the Lehigh River.

Blending will in NO WAY affect the drinking water within the Little Lehigh or Lehigh Watersheds.

Blending will NOT impact recreational activities on the Lehigh River.

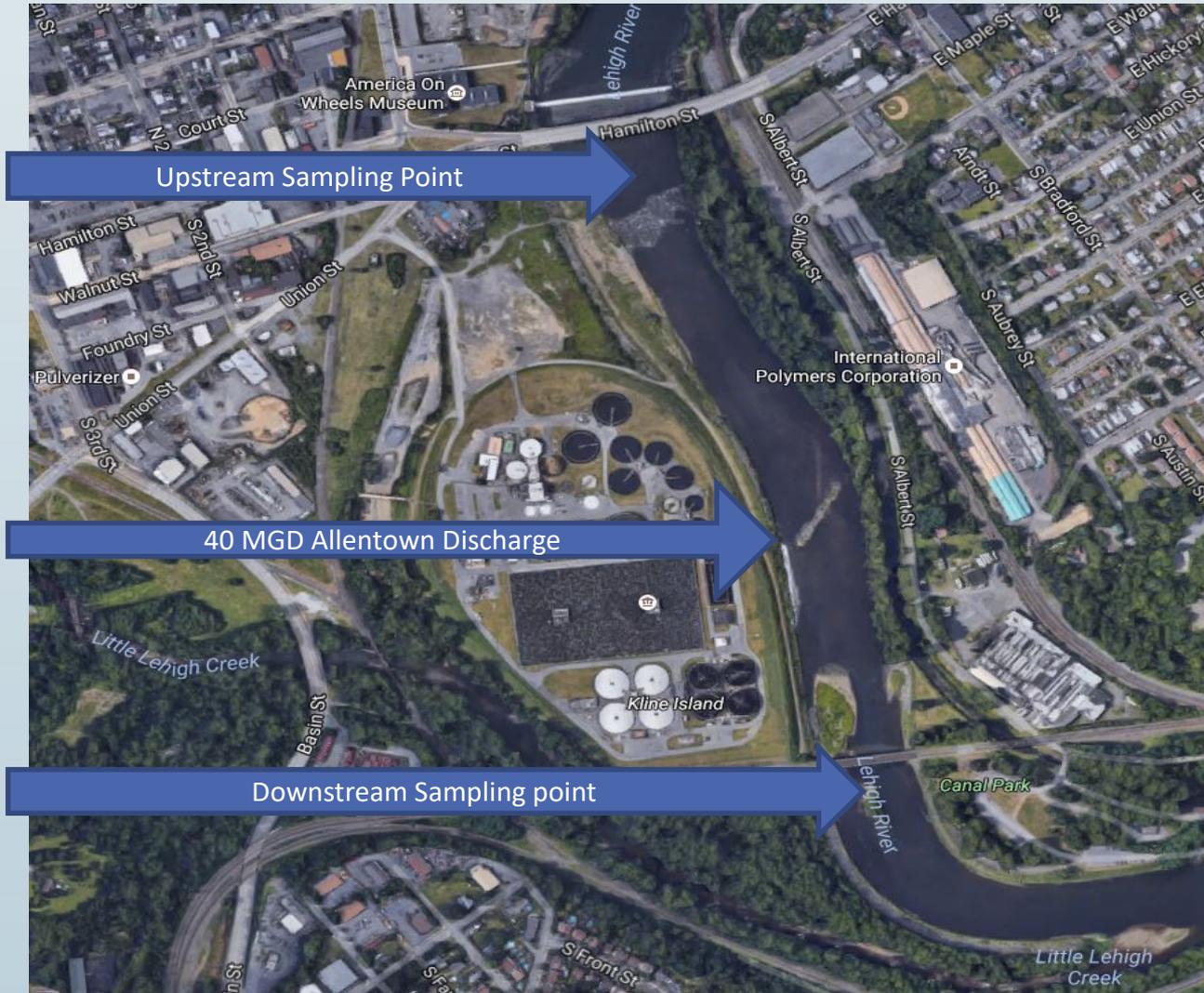
Blending is an EFFICIENT use of rate (not tax) dollars to address the EPA Administrative Order.



# What is Blending?

Blending is an in-plant alternative for treating wet-weather, high volume, sewage flows that result in a discharge into the receiving stream (Lehigh River) that complies with permit conditions.

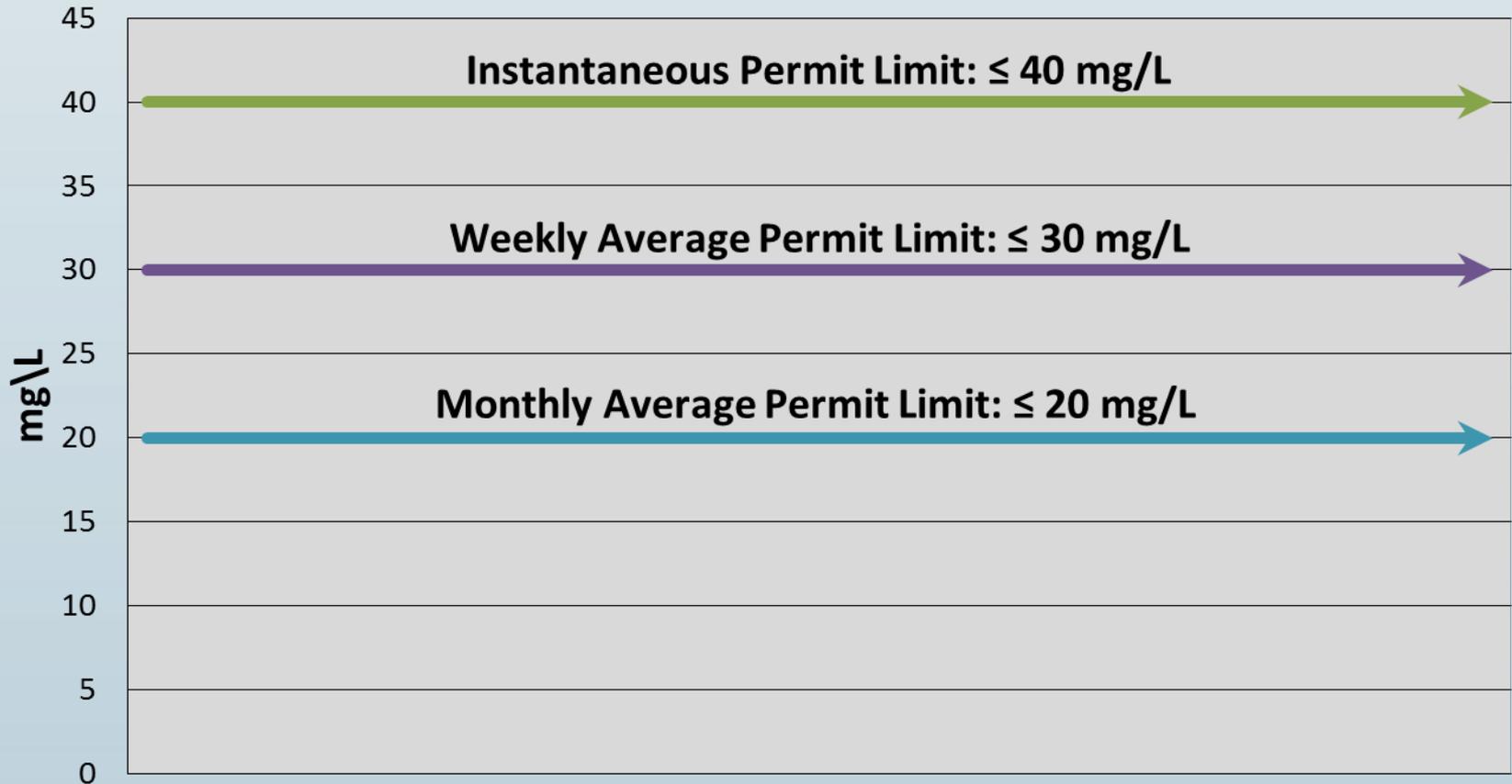
# Determining Permit Limits



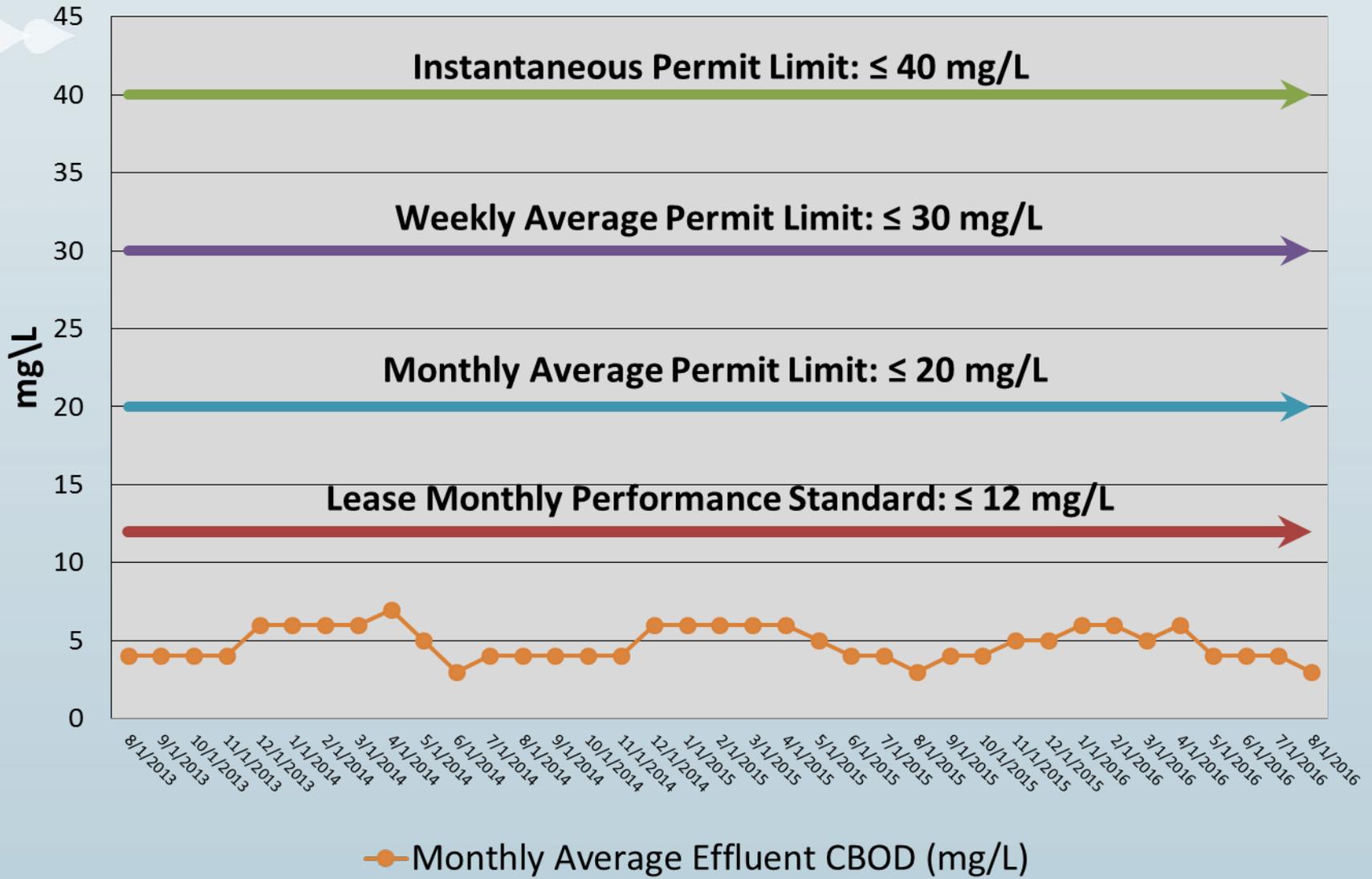
## Inputs & Considerations:

Designated Uses of The River, Pollutants of Concern, Background Concentrations, Water Chemistry (pH, Hardness, etc.), Mixing, Q7 10 Flow

# Carbonaceous Biochemical Oxygen Demand (CBOD) Permit Limits



# Carbonaceous Biochemical Oxygen Demand (CBOD)



# At the Wastewater Treatment Plant ...

The City's wastewater treatment plant can effectively treat up to 87 million gallons of sewage.

If the flow coming into the plant exceeds 87 million gallons, the excess volume must be treated to avoid an overflow at outfall 003 which is prior to the headworks (entrance) to the plant.

Two options are available:

- blending or installing equalization tank(s)



## HURRICANE IRENE

# GOOD RIDDANCE!

Irene puts August over the top as Allentown's all-time wettest month

One of the worst storms to hit our customers in 20 years, PPL says

Start of school year delayed in Bethlehem, Easton, elsewhere



HARRY FISHER/THE MORNING CALL

The Colonial Industrial Quarter in Bethlehem was overcome by floodwaters from the Monocacy Creek as Hurricane Irene passed through the Lehigh Valley on Sunday morning.

# View of the Lehigh River from the Hamilton Bridge during Hurricane Irene



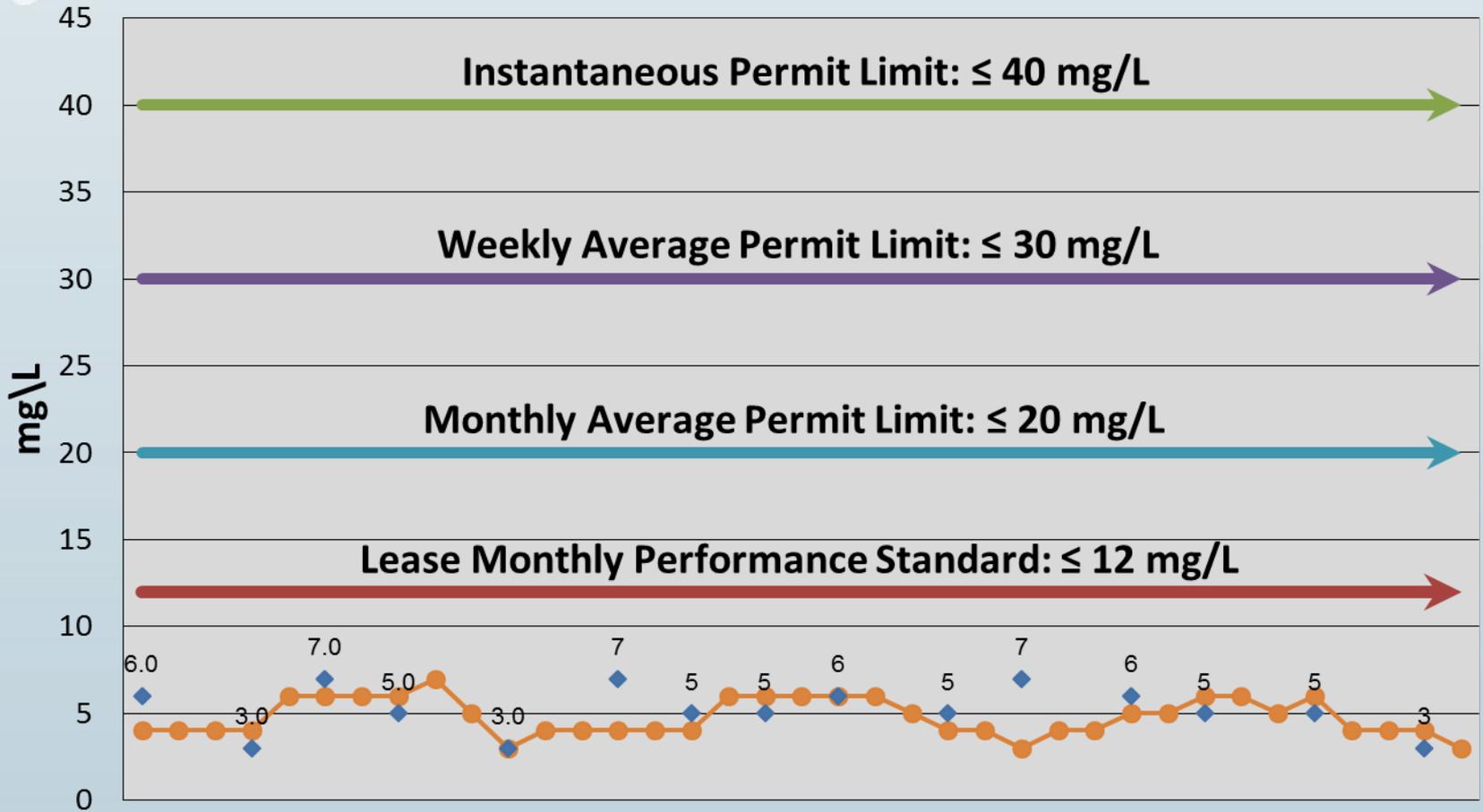
# 003 Outfall Bypasses

Date	Storm Event	003 Total Volume (MGD)	Plant flow (MGD)
2/24/2016	Mechanical Problem - Pumps & Hydraulic Capacity Exceeded	1.18	47.16
2015	No Bypasses		
10/29/2014	Mechanical Problem - Bar Screens	0.0072	29.53
4/30/2014	Mechanical Problem - Bar Screens & Hydraulic Capacity Exceeded	0.9890	62.02
5/1/2014	Mechanical Problem - Bar Screens & Hydraulic Capacity Exceeded	0.1790	71.74
2013	No Bypasses		
8/5/2012	Power Outage - Severe Thunderstorm	0.0144	30.01
9/6/2011	Hydraulic Capacity Exceeded - Lee	0.0440	77.18
9/7/2011	Hydraulic Capacity Exceeded - Lee	2.0400	86.21
8/28/2011	Hydraulic Capacity Exceeded - Irene	4.6600	84.24
8/13/2011	Mechanical Problem - Pumps	0.3950	30.95
9/30/2010	Mechanical Problem - Bar Screens& Hydraulic Capacity Exceeded	2.3000	49.32
10/1/2010	Mechanical Problem - Bar Screens& Hydraulic Capacity Exceeded	3.0200	63.82
2009	No Bypasses	-	
12/12/2008	Mechanical Problem - No.5 Aux. Pump	0.0400	66.63
2/13/2008	Hydraulic Capacity Exceeded	0.7400	68.87
2007	No Bypasses	-	-
6/28/2006	Hydraulic Capacity Exceeded	2.8100	76.07
6/26/2006	Mechanical Problem Bar Screens	0.4000	42.39

# 003 Outfall Bypasses

Date	Storm Event	003 Total Volume (MGD)	Plant flow (MGD)	Treated Plant CBOD (mg/L)
2/24/2016	Mechanical Problem - Pumps & Hydraulic Capacity Exceeded	1.18	47.16	6
2015	No Bypasses			
10/29/2014	Mechanical Problem - Bar Screens	0.0072	29.53	3.0
4/30/2014	Mechanical Problem - Bar Screens & Hydraulic Capacity Exceeded	0.9890	62.02	7.0
5/1/2014	Mechanical Problem - Bar Screens & Hydraulic Capacity Exceeded	0.1790	71.74	5.0
2013	No Bypasses			
8/5/2012	Power Outage - Severe Thunderstorm	0.0144	30.01	3.0
9/6/2011	Hydraulic Capacity Exceeded - Lee	0.0440	77.18	7.0
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6/28/2006	Hydraulic Capacity Exceeded	2.8100	76.07	5.0
6/26/2006	Mechanical Problem Bar Screens	0.4000	42.39	3.0

# Carbonaceous Biochemical Oxygen Demand (CBOD)



● Monthly Average Effluent CBOD (mg/L)

◆ Effluent CBOD (mg/L) during bypass events



# COMPLIANCE

As environmentalists, many of you realize that in addition to the concentration being low, the total pounds of a pollutant discharged to the Lehigh River must be within the permit limits as the total flow leaving the plant will now be greater than the 40MGD .

Blending is a treatment alternative designed to **fully comply** with permit conditions.



# NPDES Permits and Water Quality Protection

- Wastewater treatment Plant (WWTP) performance, operation, and monitoring regulated by NPDES Permits
- Goal of federal NPDES program is to protect water quality
- NPDES Permits stipulate the specific effluent limits required for water quality protection
- Performance data submitted to PADEP on a monthly basis for review
- **NPDES Permit Compliance =Water Quality Protection**

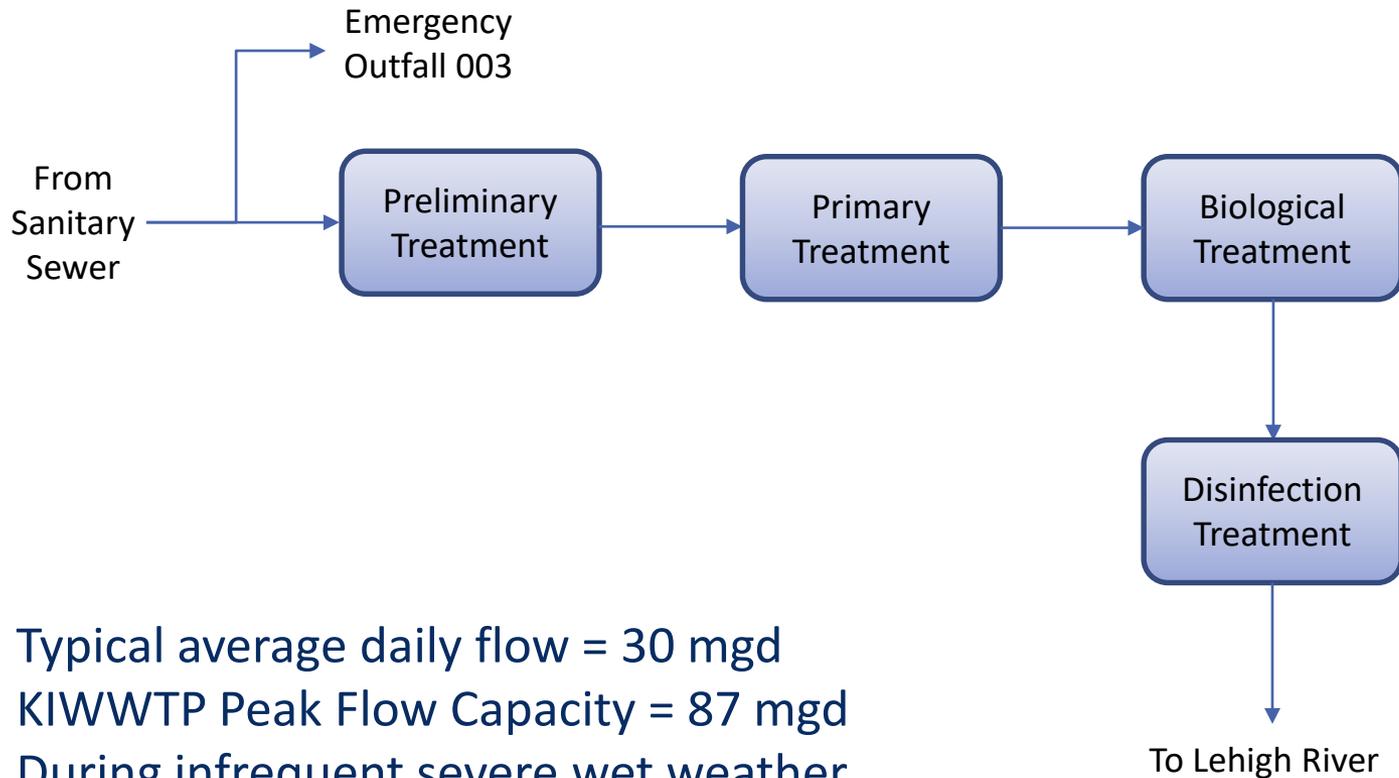
# KIWWTP Effluent Limits

<b>Parameter</b>	<b>Monthly Average</b>	<b>Weekly Maximum</b>	<b>Instantaneous Maximum</b>
CBOD <sup>(1)</sup>	20 mg/L	30 mg/L	40 mg/L
TSS <sup>(2)</sup>	30 mg/L	45 mg/L	60 mg/L
NH3 <sup>(3)</sup> -Summer	5 mg/L	n/a	10 mg/L
NH3 <sup>(3)</sup> -Winter	15 mg/L	n/a	30 mg/L
FC <sup>(4)</sup> - Summer	200 cfu/100 ml	n/a	1,000 cfu/100 ml
FC <sup>(4)</sup> - Winter	2,000 cfu/100/ml	n/a	10,000 cfu/100 ml

1. Carbonaceous Biochemical Oxygen Demand
2. Total Suspended Solids
3. Ammonia-Nitrogen
4. Fecal Coliform

- KIWWTP designed to achieve these limits

# KIWWTP Plant Flow Diagram



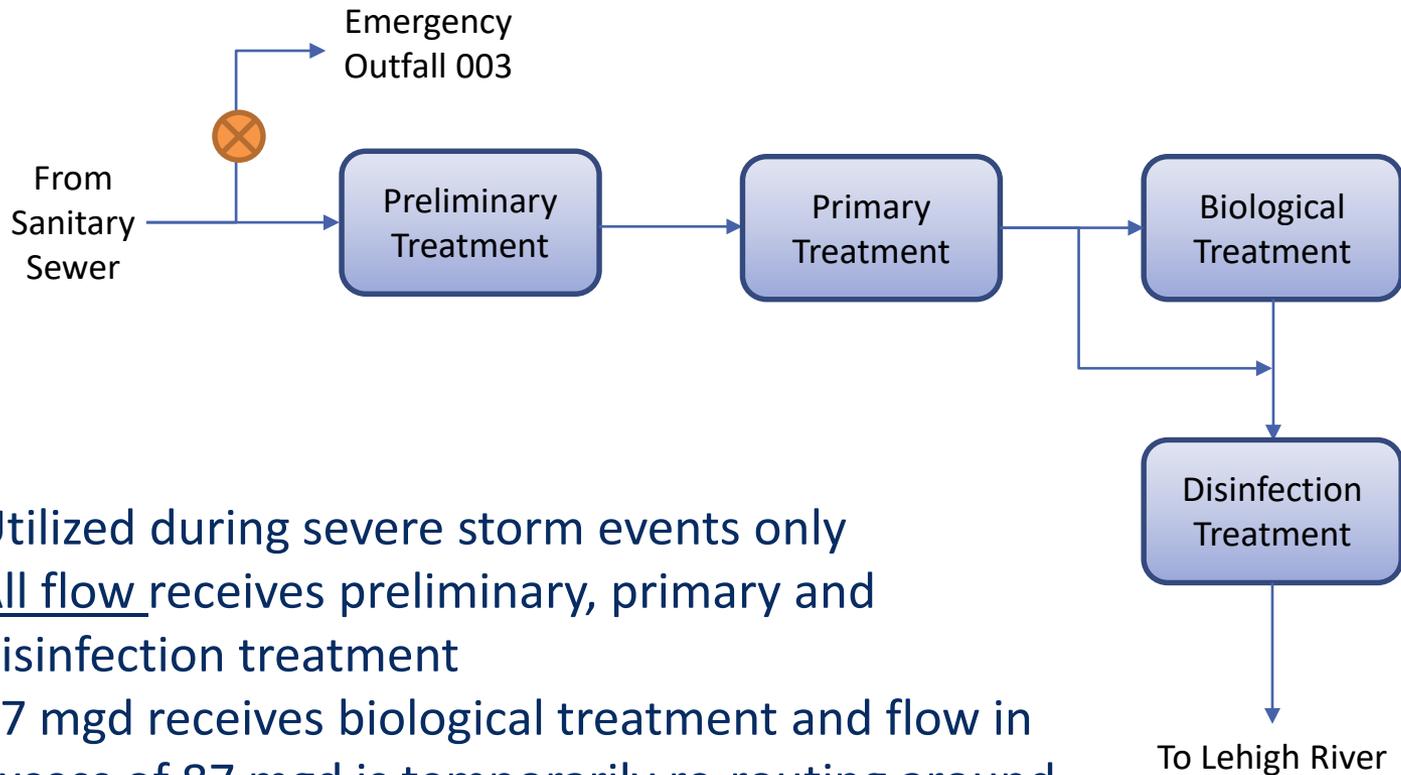
- Typical average daily flow = 30 mgd
- KIWWTP Peak Flow Capacity = 87 mgd
- During infrequent severe wet weather events peak flow can exceed 87 mgd



# Blending Objectives

- Enable KIWWTP to treat infrequent wet weather flows > 87 mgd resulting from severe storm events
- Comply with all effluent limits
- Comply with the Administrative Order
- Significantly reduce capital cost and user rate impacts compared to temporarily storing excess wet weather flows in large tanks - Flow Equalization

# KIWWTP Blending Flow Diagram



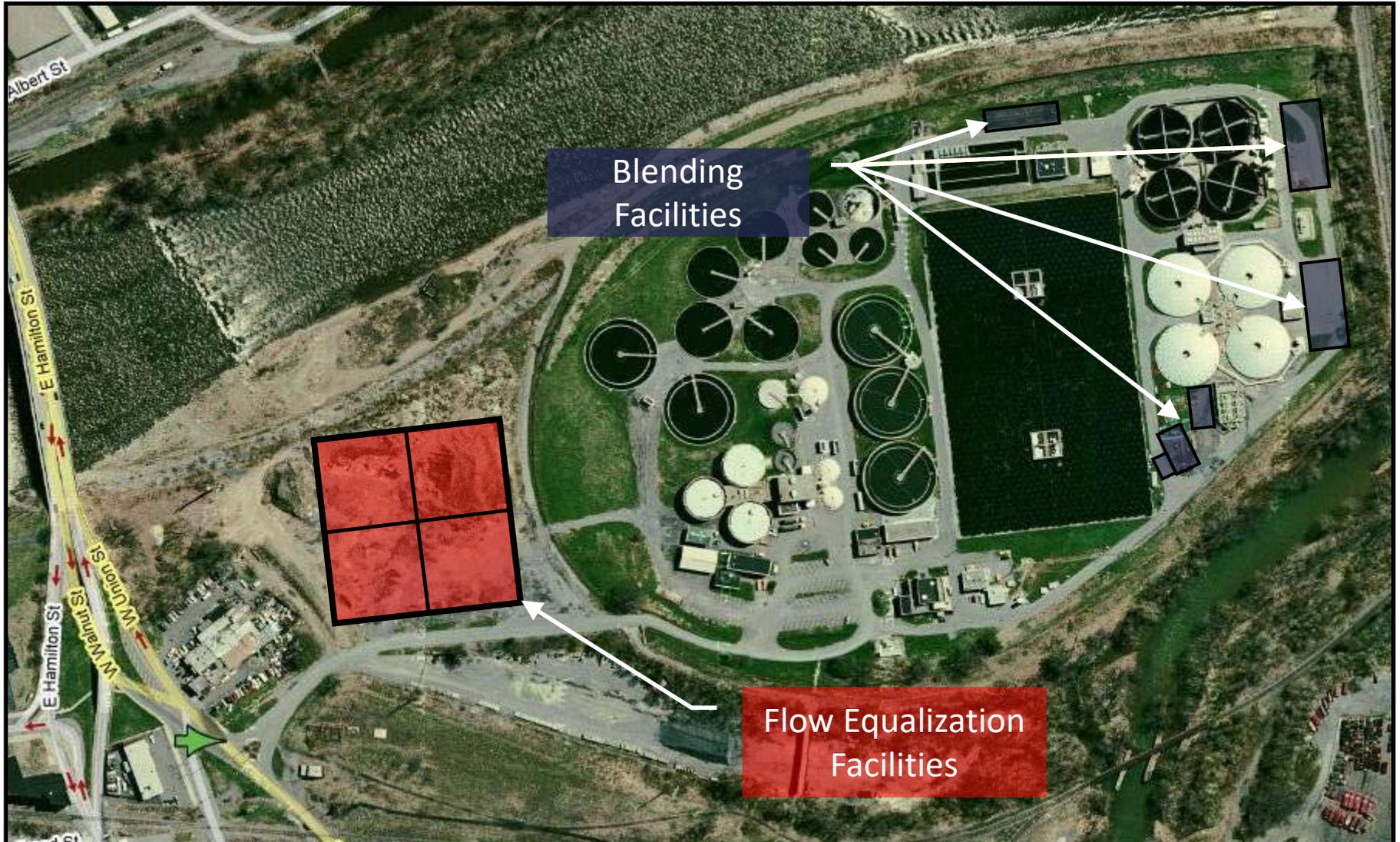
- Utilized during severe storm events only
- All flow receives preliminary, primary and disinfection treatment
- 87 mgd receives biological treatment and flow in excess of 87 mgd is temporarily re-routing around the biological treatment process
- Will comply with all NPDES Permit effluent limits

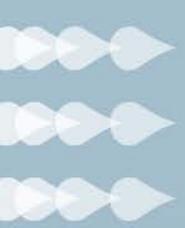


# Blending Benefits

- Cost savings of approximately \$37 million in comparison to flow equalization
- No impact on effluent limit compliance
- No impact on water quality
- Enhanced operational benefits
  - Improve resiliency and maintainability of existing treatment systems
- No odor generation concerns
- Conservation of land for future use
  - Blending facilities require much smaller land area, thus conserving a much larger percentage of the limited remaining land area for potential future uses
    - Such as treatment of emerging contaminants that could be regulated in the future

# Land Use Comparison





Questions  
?

# EPA AO Status Update Public Meeting

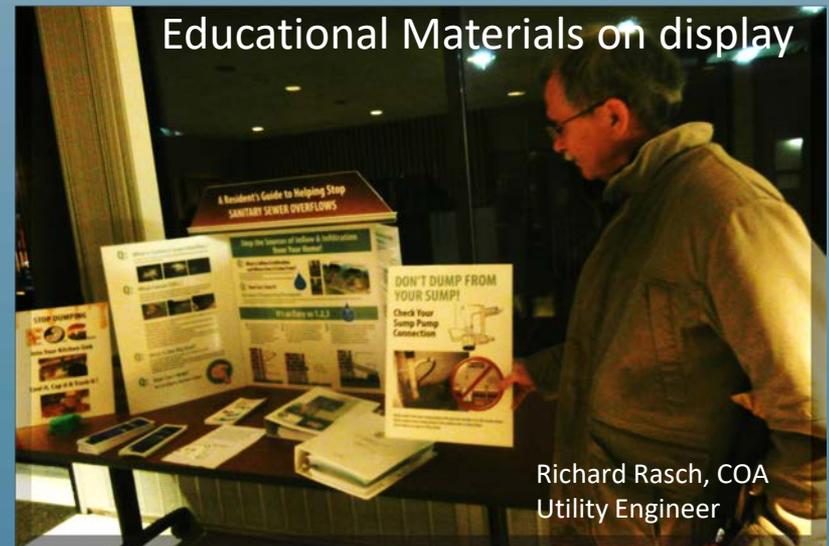


Dan Koplish, Water, Waste Water, Storm Water Management Consultant



Tim Bradley, Vice-President, Kleinfelder

November 9, 2016  
City Council Chambers



Richard Rasch, COA  
Utility Engineer