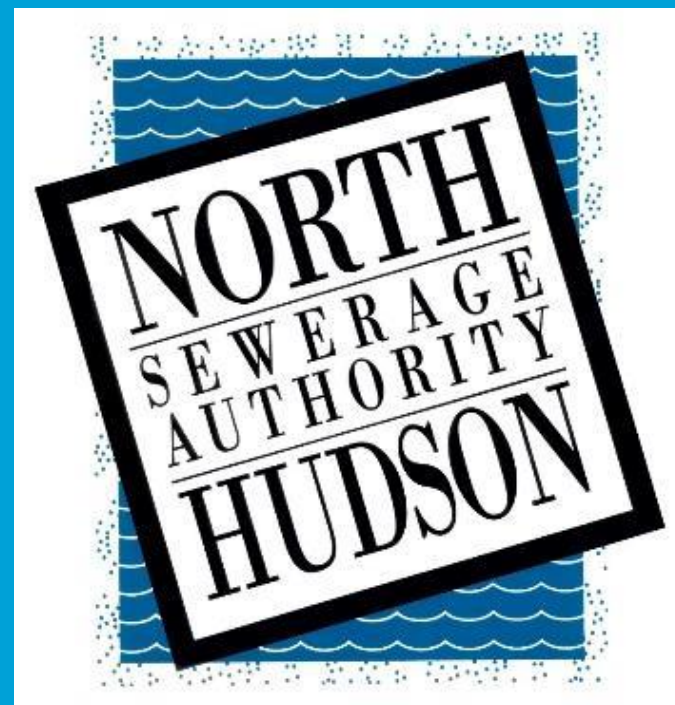


LTCP Alternatives Analysis North Hudson Sewerage Authority

CSO Permittee Network Meeting
Elizabeth City Hall Council Chambers
November 8, 2018



New Jersey Pollution Discharge Elimination System (NJPDES) Permits require an Alternative Analysis for Developing the LTCP

*D.3.b.v: Step 2 - **Development and Evaluation of Alternatives for the LTCP** - In accordance with Sections G.2. through G.5. and G.9., the permittee shall submit an approvable Development and Evaluation of Alternatives Report: within 48 months from the effective date of the permit (EDP).*

- *G.2.c.iii: [Supplemental CSO Team] Provide input for consideration in the evaluation of CSO control alternatives;*

*G.4.a: **The permittee shall evaluate a reasonable range of CSO control alternatives**, in accordance with D.3.a and G.10, that will meet the water quality-based requirements of the CWA using either the Presumption Approach or the Demonstration Approach (as described in Sections G.4.f. and G.4.g).*

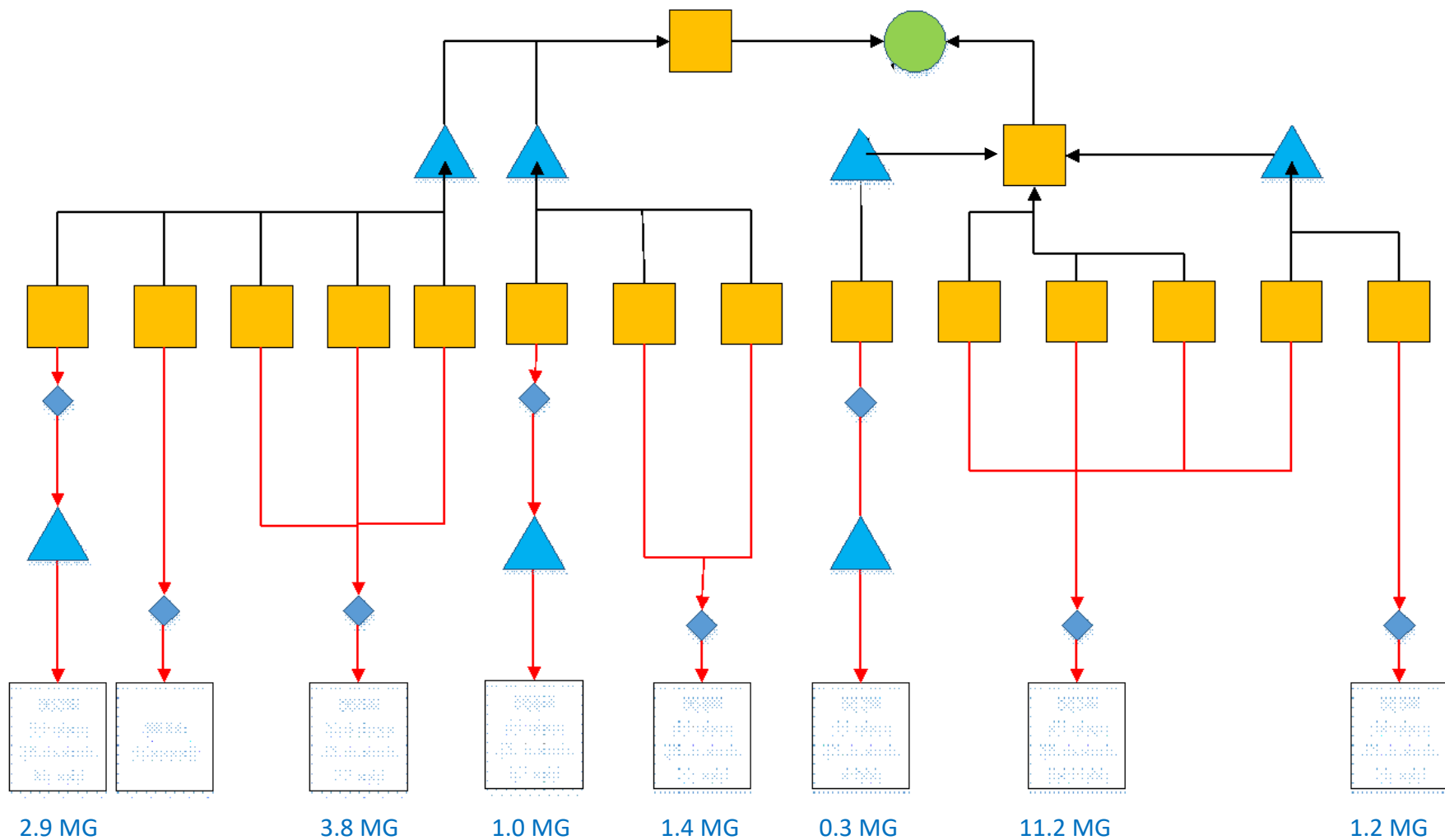
*G.4.e: The permittee shall evaluate a range of CSO control alternatives predicted to accomplish the requirements of the CWA..... The permittee shall **evaluate the practical and technical feasibility** of the proposed CSO control alternative(s), **and water quality benefits** of constructing and implementing various remedial controls and combination of such controls and activities which shall include, but not be limited to the controls below:*

- i. *Green infrastructure.*
- ii. *Increased storage capacity in the collection system.*
- iii. *STP expansion and/or storage at the plant (an evaluation of the capacity of the unit processes must be conducted at the STP resulting in a determination of whether there is any additional treatment and conveyance capacity within the STP). Based upon this information, the permittee shall determine (modeling may be used) the amount of CSO discharge reduction that would be achieved by utilizing this additional treatment capacity while maintaining compliance with all permit limits*
- iv. *I/I reduction to meet the definition of non-excessive infiltration and non-excessive inflow as defined in N.J.A.C. 7:14A-1.2 in the entire collection system that conveys flows to the treatment works to free up storage capacity or conveyance in the sewer system and/or treatment capacity at the STP, and feasibility of implementing in the entire system or portions thereof.*
- v. *Sewer separation.*
- vi. *Treatment of the CSO discharge.*
- vii. *CSO related bypass of the secondary treatment portion of the STP in accordance with N.J.A.C. 7:14A-11.12 Appendix C, II C.7.*

North Hudson Alternative Analysis Approach

- ✓ • Use characterization work as a baseline for planning
- ✓ • Integrate ongoing CSO control projects into the LTCP development process as part of the baseline
- ✓ • Conduct a CSO Alternative Analysis Concept Workshop to identify CSO control alternatives for each CSO outfall
- ✓ • Assign engineers to evaluate CSO alternatives for each outfall
 - Pilot CSO control technologies
 - Submit *Development and Evaluation of Alternatives Report* to NJDEP in 2019

Adams Street WWTP Baseline Characterization - CSOs During Typical Year (2004)



5th Largest typical year storm volumes to be captured to achieve 4 overflows/year

Ongoing Projects to be Integrated into the LTCP development process:

- Sewer Lining
- Hoboken H2 CSO Closure
- Hoboken Southwest Park and Jackson and 7th Street Optimization
- Hoboken H6/H7 CSO LTCP Project
- Green Infrastructure Projects
 - Hoboken Green Infrastructure Strategic Plan
 - North Hudson Projects in Weehawken, Union City and West New York



CSO Alternative Analysis Concept Workshop

- Goal: Develop conceptual approaches and identify technologies for reducing the frequency and volumes of the Authority's CSOs.
- Participants:
 - Authority staff, operational staff, on-call engineers,
 - NJDEP, City of Newark, NJ Future
- 2-Day Workshop – Held June 14-15, 2018
 - Used characterization information to review existing conditions
 - Developed CSO control alternatives to reduce overflows
- Deliverable: Memo with Findings and Recommendations

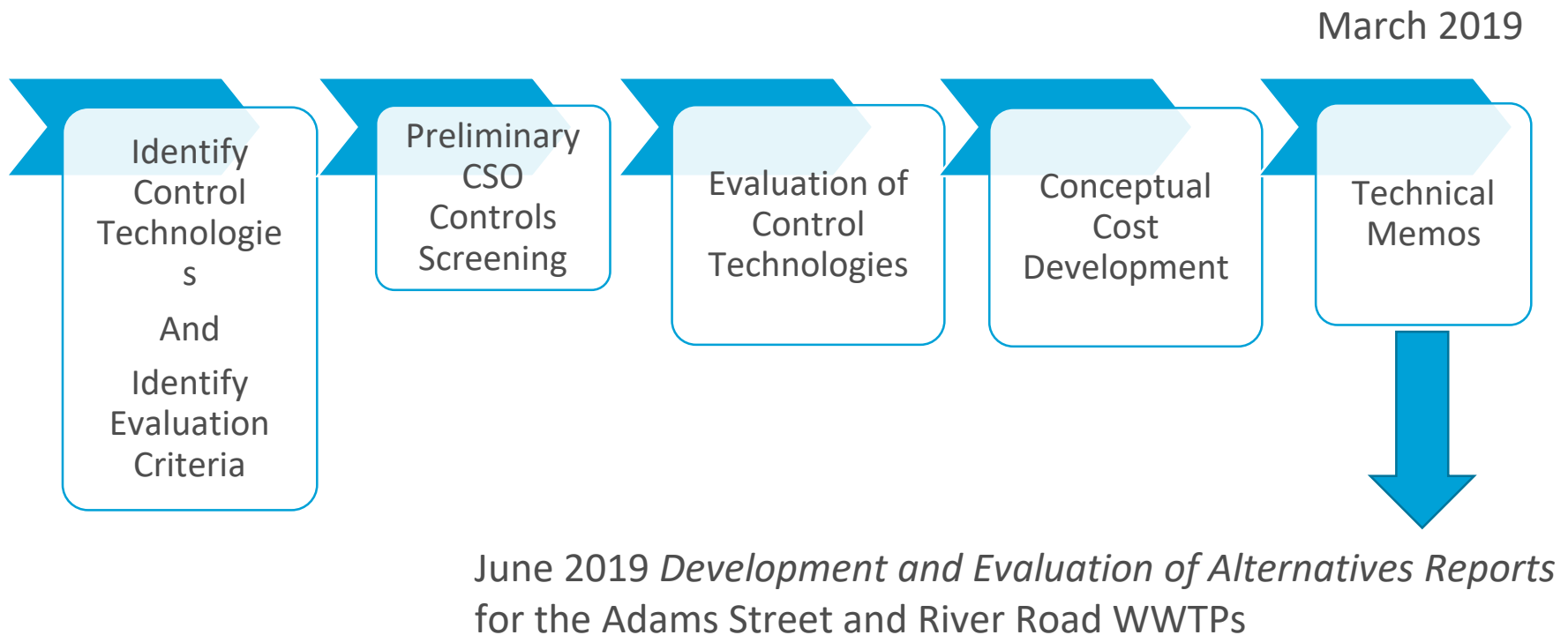


Workshop Recommendations for Alternative Analysis

Outfall	Key Takeaways, Design Points and Control Alternatives
012A	<ul style="list-style-type: none">• Maximize flow to WWTP with increased capacity and larger/second force main from 18th Street Pump Station.• Disinfect at 18th Street Pump Station.• 300,000 gallons may be stored at identified open spaces.
013A	<ul style="list-style-type: none">• Relocating regulators would require dry weather flow connections running from the top of the hill and down the steep rock cliff. This would allow for flow control upstream of the high-energy drop. Biggest issue would be constructing new dry weather flow connections. Benefit would be elimination of the need for manual control of dry weather flow at these locations.• Drop shaft at the top of the hill under Park Avenue to tunnel gently sloped and directed towards Adams Street WWTP.• New drop shafts will likely require vertical flow control.• Overflow detention can include disinfection upstream of the W1234 S/F.• Currently 24-inch and 12-inch siphon on backside of the WWTP. Can increase capacity of the siphon with a third barrel. That would take more flow from the north as a benefit.
015A	<ul style="list-style-type: none">• NHSA intends to further investigate drainage area and possibly meter flows again to better characterize wet weather flows and overflows.• Add disinfection at vortex.• Confirm overflows through vortex and analyse the amount of chlorine contact time needed. Replace/upsized vortex if necessary to achieve required contact time.

Four Alternative Analysis Projects

- End-of-Pipe Bacteria CSO Controls
- Adams Street WWTP, H1-H5, and W1234 CSO Controls
- 18th Street Pump Station and W5 CSO Controls
- River Road (JOSO, WNY1) CSO Controls



Preliminary CSO Control Screening – Adams Street Outfalls

Regulator	Outfall	Technologies
H1	002A	<ul style="list-style-type: none">· Linear Storage under Observer Highway· Storage under nearby parking lot, however this is slated for development
H3/H4/HSI	005A	<ul style="list-style-type: none">· Mirror Pier C Park and use as storage opportunity· Storage under Stevens Park and/or nearby baseball field· Tunneling under Stevens Park· Consolidate flow with 006A

Preliminary CSO Control Screening – Adams Street System-wide

Category	Technologies
Inflow/infiltration	Analyze solutions for inflow/infiltration system-wide for Adams Street service area
Green Infrastructure	Available information on Hoboken’s green infrastructure plan and previous analyses conducted will be compiled to develop the type and/or quantity of green infrastructure that would be effective for the service area
Increased Conveyance	Construction of a parallel siphon
Increased Capacity	<ul style="list-style-type: none"> • Analyze possible increased storage from upgrades to dissolved air flotation filters • New Outfall with Solids/Floatables control • Replace one trickling filter with storage tank • Storage at existing sludge handling building
Tunneling	<ul style="list-style-type: none"> • Hold, Release, Treat-Strategy for tunnel in Weehawken. • Convey, Release, Treat-Strategy for tunnel in Hoboken
Treatment	Sidestream/blending treatment to allow for increased flow or storage at WWTP

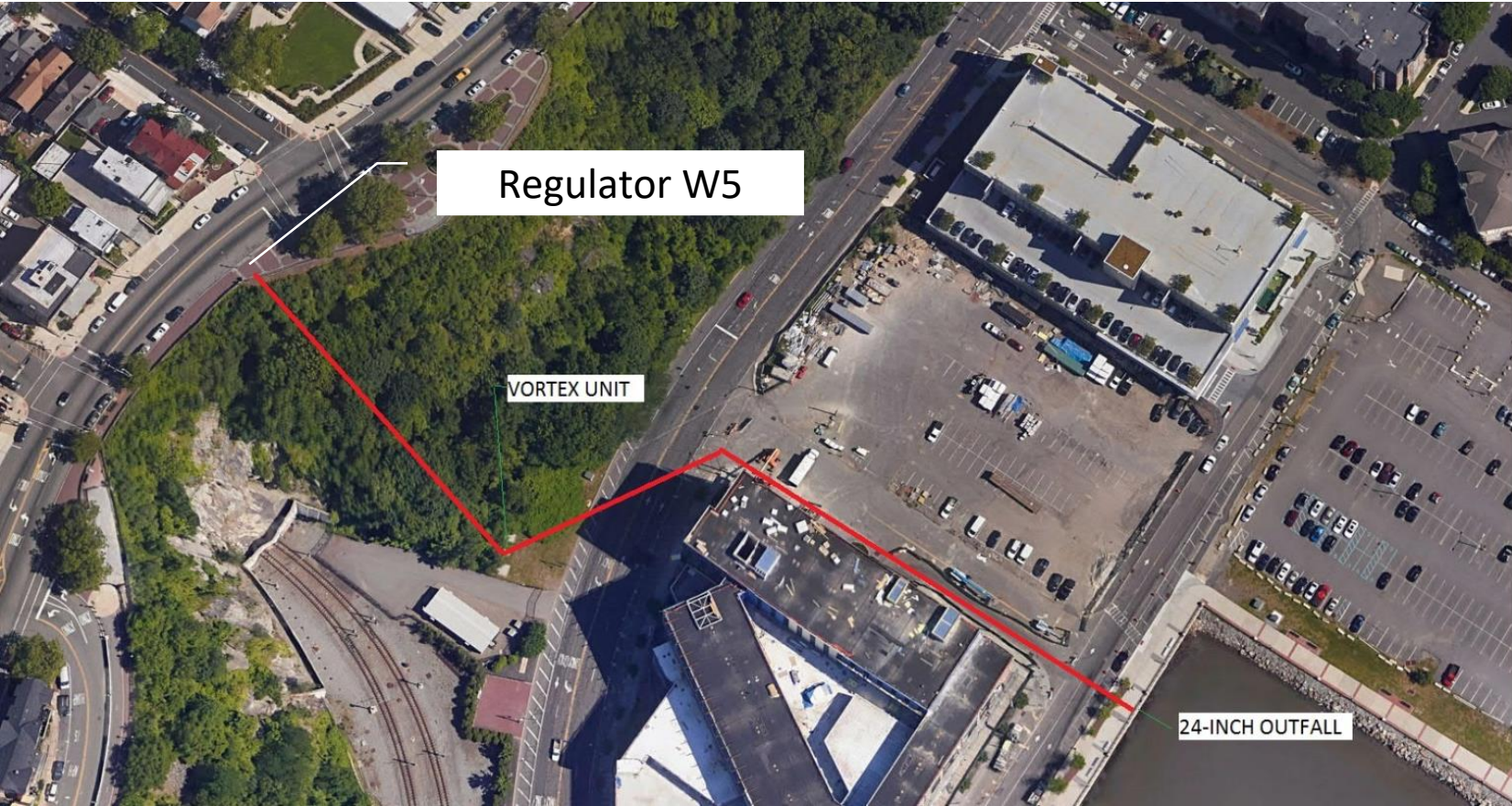
Evaluation of Technologies

Weighted Evaluation Criteria

Category	Category Weight (%)
CSO Reduction	15
Feasibility	15
Regulatory Compliance	10
Location Constraints	20
Cost	20
Community Impact	10

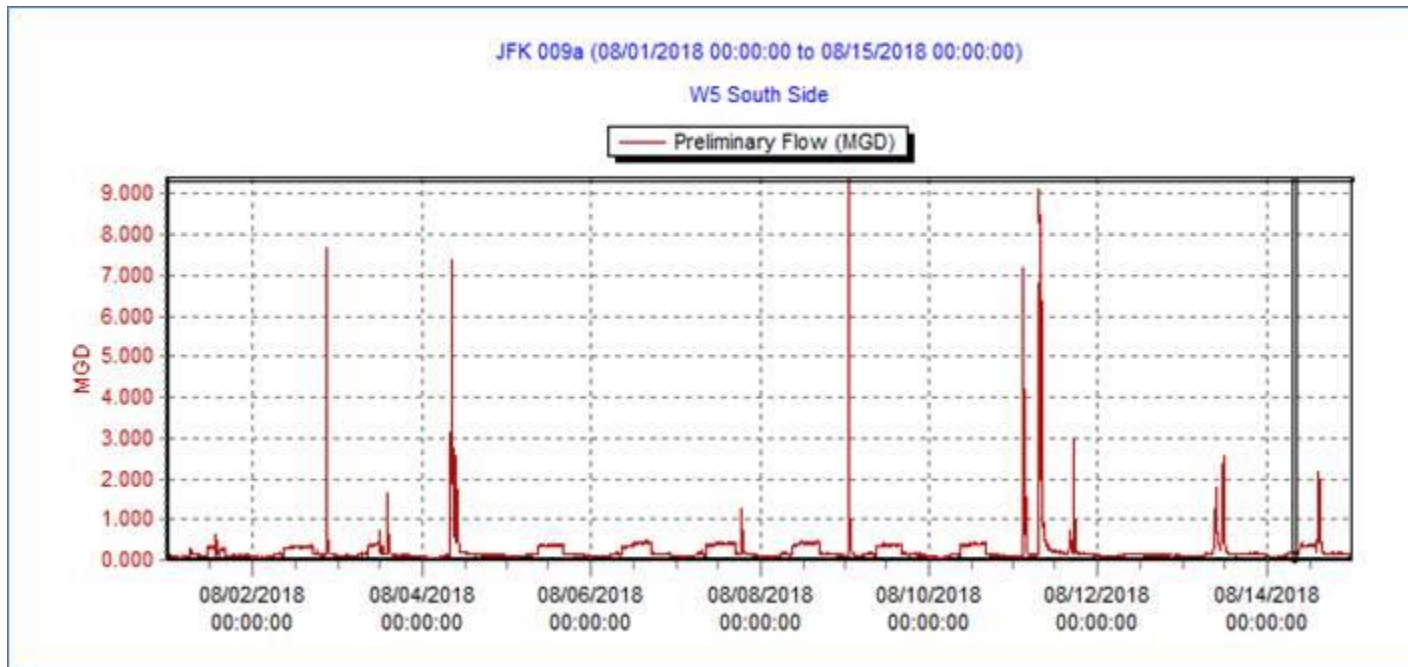
Category	Criteria
Feasibility	Availability of validation on main technology for the alternative
	Flexibility of the alternative to be adjusted or optimized with future changing flows
	Flexibility of the alternative to provide effective operation under variety of operating conditions.
	Anticipated Operations from the Authority's personnel
	Reliability
Location Constraints	Anticipated Land Acquisition
	Anticipated Traffic Impacts
	Compatibility with Existing Infrastructure
	Anticipated Noise and Odor Impacts
	Physical Characteristics

W5 Pilot Disinfection Study



W5 Disinfection Pilot Work

- 24-inch outfall
- Flows under pressure
- Chlorination/Dechlorination
- Submitting a Work Plan to the NJDEP in the next 60-days



Thank You

