



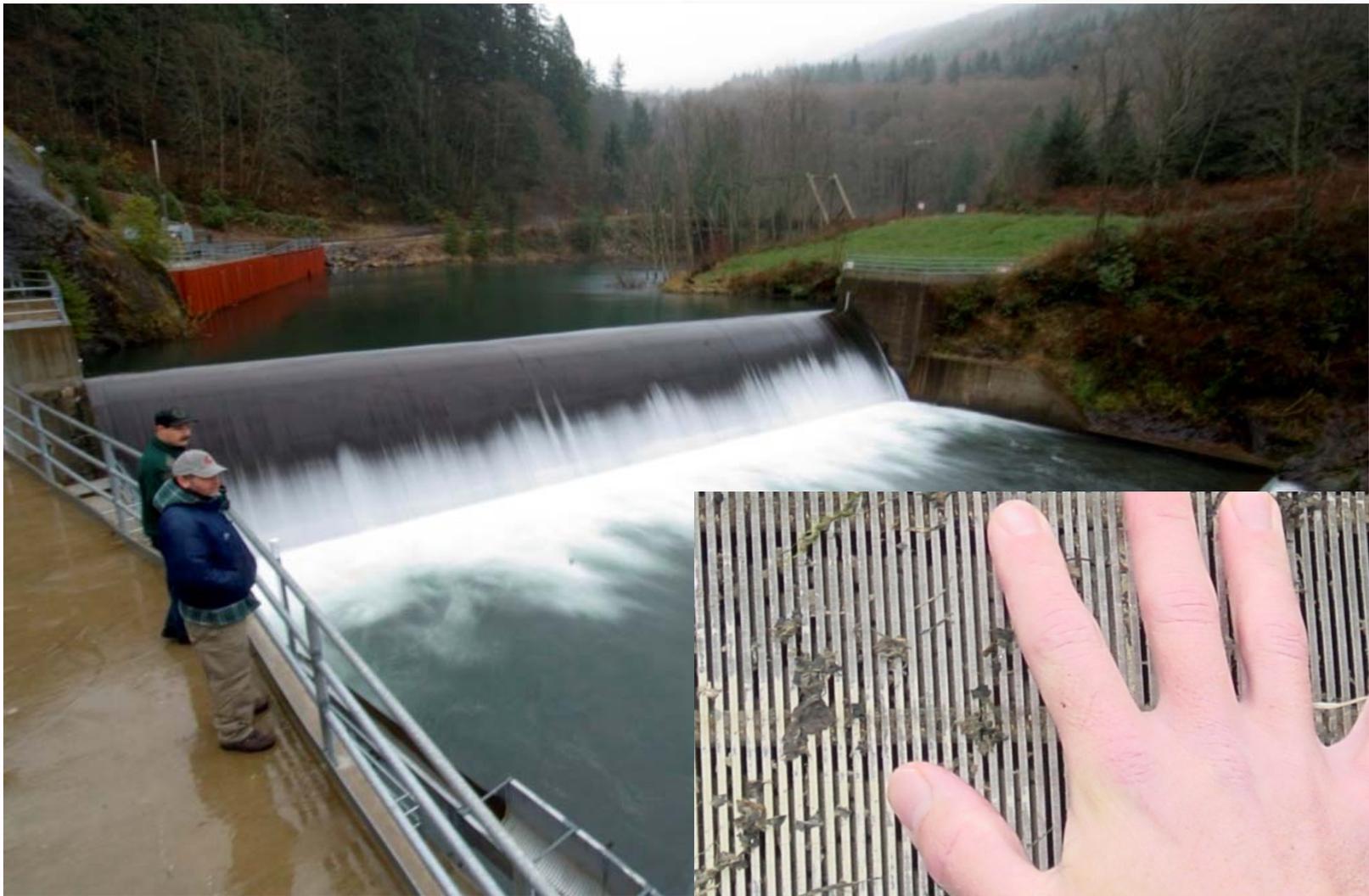
TACOMA  WATER

Tacoma Water's Future Surface Water Treatment *Balancing the Risks*

PNWS-AWWA Annual Conference

May 8, 2009

Unfiltered



Unfiltered

New Long Term 2 Enhanced Surface Water Treatment rule (LT2)

- New rule requires:
 - Additional public health protection against *Cryptosporidium*
- Options
 - Challenge rule or pursue variance
 - Treatment Options
 - UV light disinfection
 - Filter



Challenge Rule/Pursue Variance

- Portland / New York court challenge
 - Federal Court rejected cities' arguments Nov. 6, 2007.
- Variance option
 - EPA rejected Portland's proposal for combination epidemiological/public health surveillance & source monitoring.
 - Portland alternately proposed to demonstrate *Cryptosporidium* levels less than 0.000075 oocysts/L.
 - Detection of a single *Cryptosporidium* organism in 800 liters places our current level at about 17 X the variance allowed by EPA. Testing in the early 1990's showed higher levels.
 - Washington state specifically prohibits a variance from microbial contaminants.

Second Supply Project Service Area

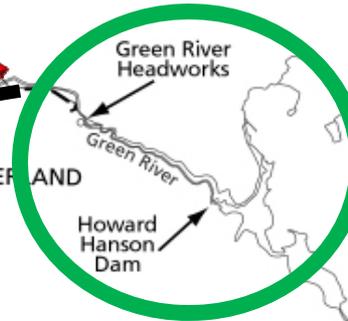


Second Supply Pipeline (\$136 M)
95 MGD

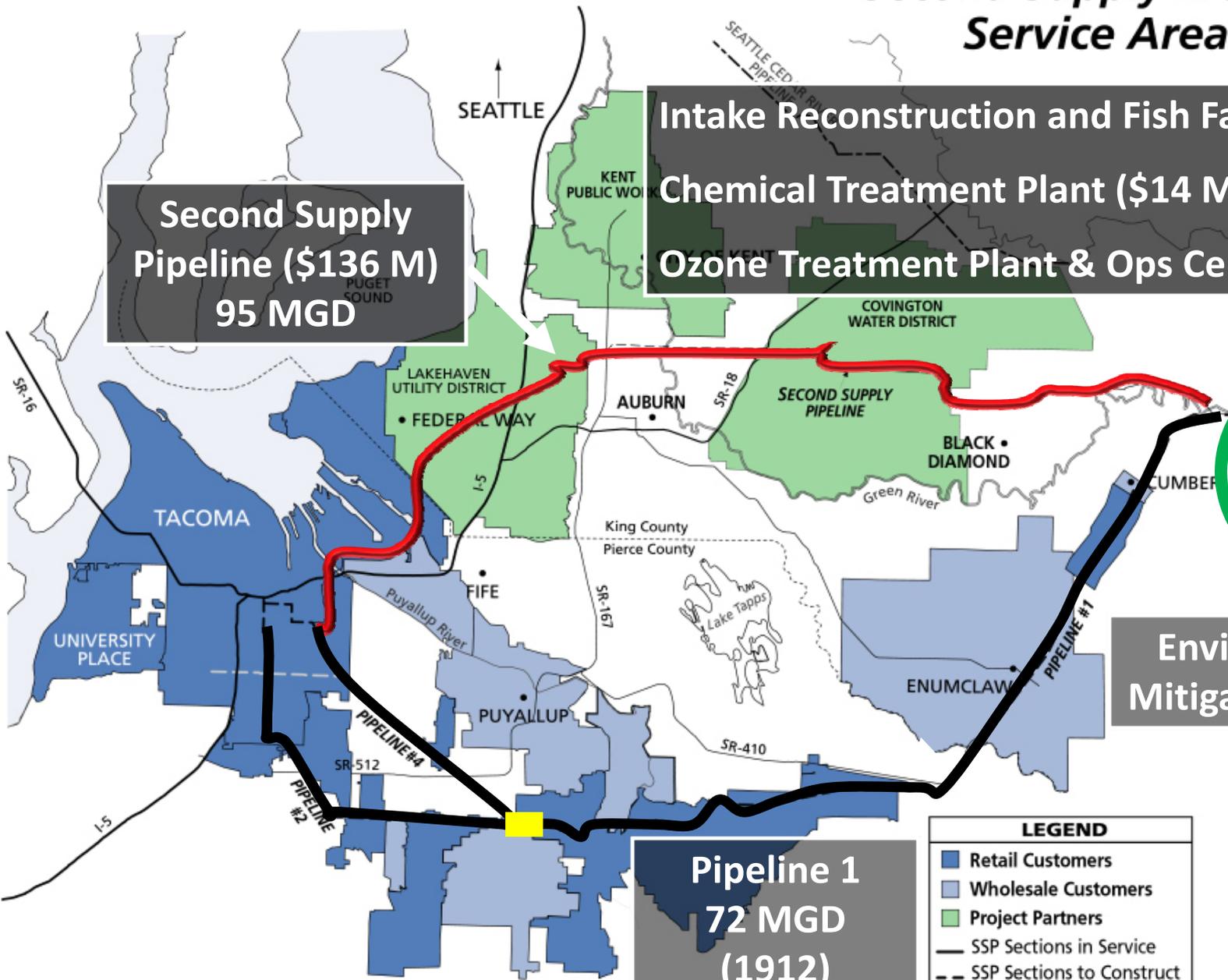
Intake Reconstruction and Fish Facility (\$15 M)
Chemical Treatment Plant (\$14 M)
Ozone Treatment Plant & Ops Center (\$22 M)

Environmental Mitigation (\$25 M)

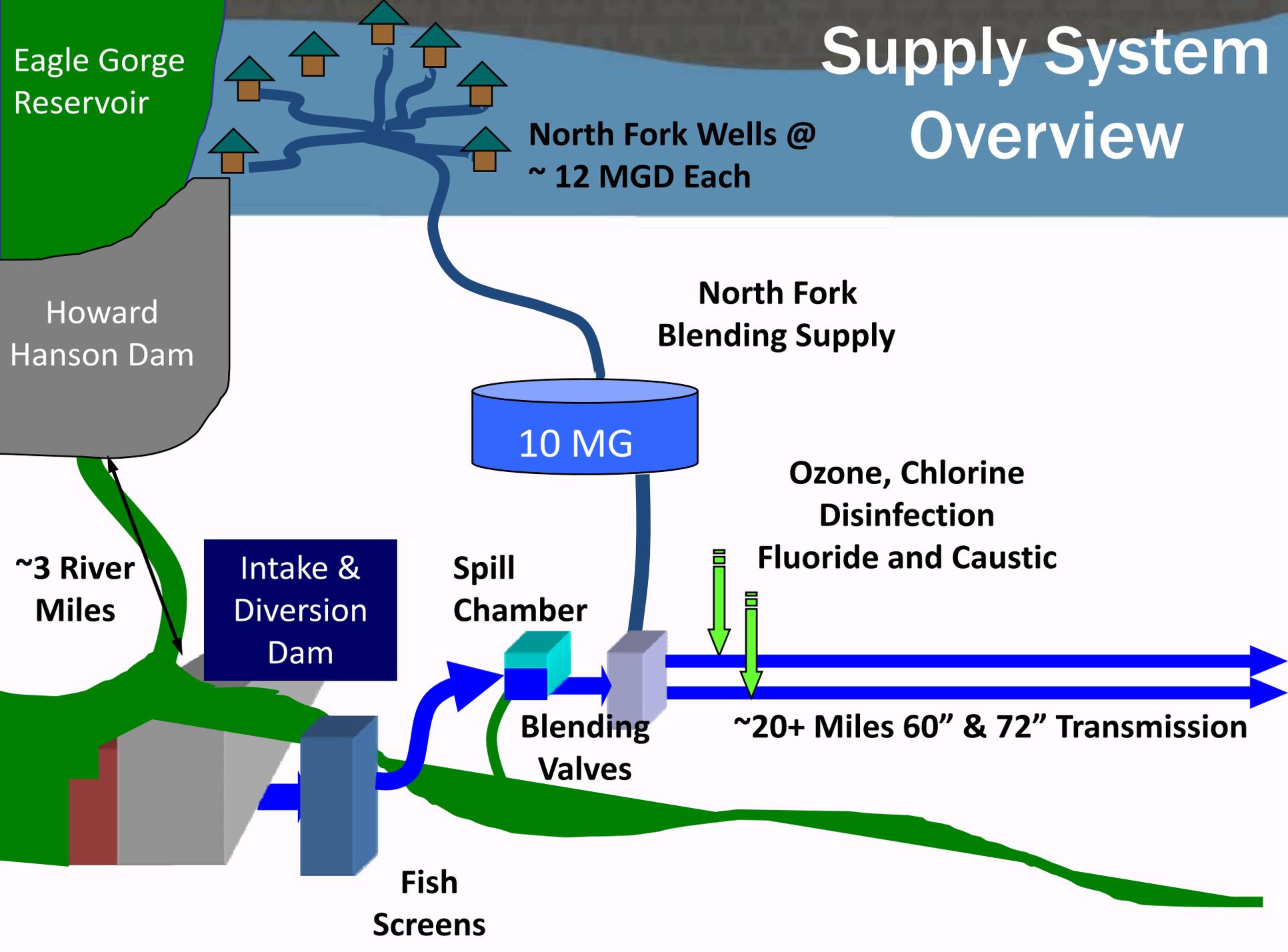
Pipeline 1
72 MGD
(1912)



LEGEND	
■	Retail Customers
■	Wholesale Customers
■	Project Partners
—	SSP Sections in Service
- - -	SSP Sections to Construct

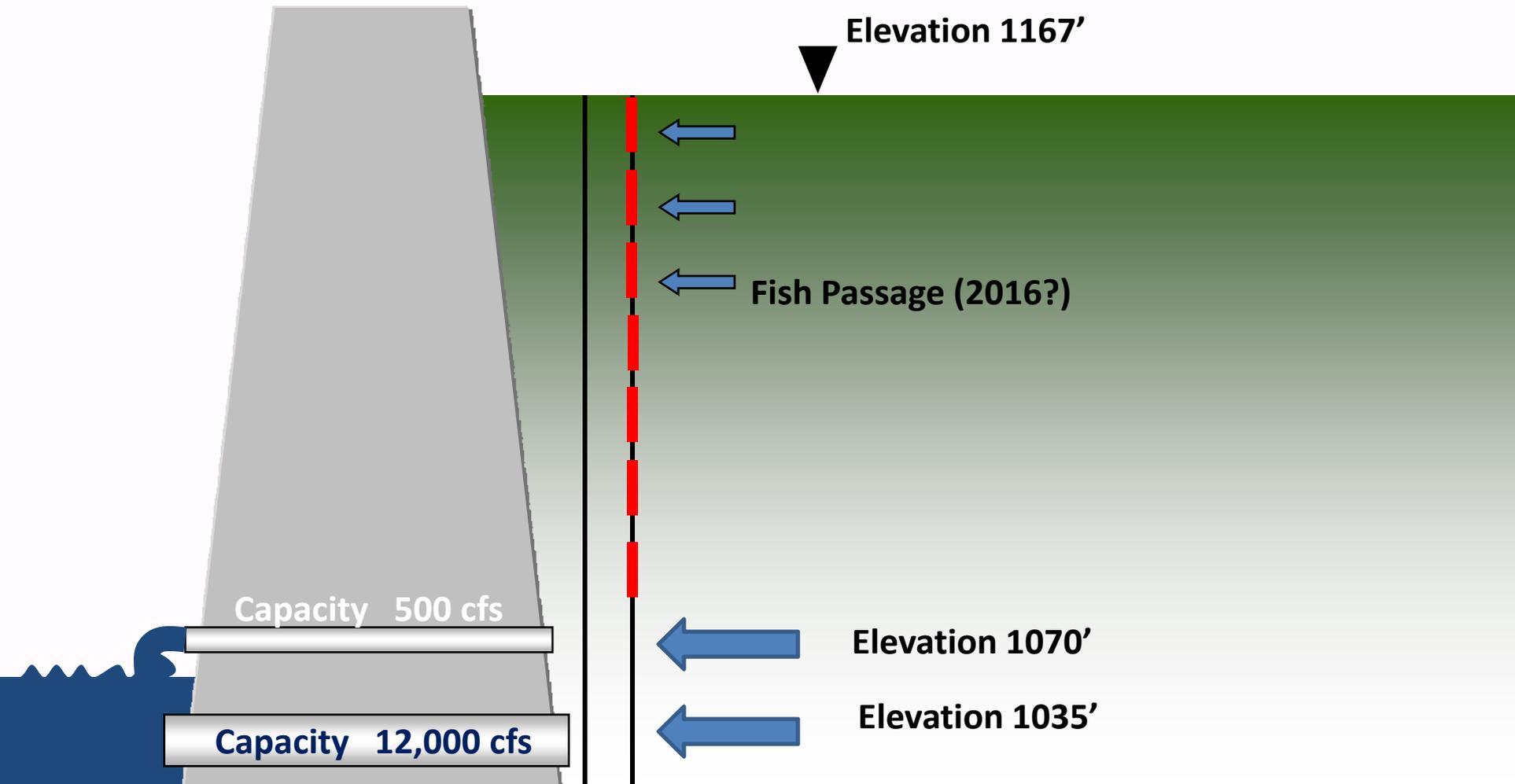


Supply System Overview





Additional Storage, Reservoir Operation and Fish Passage



Unfiltered

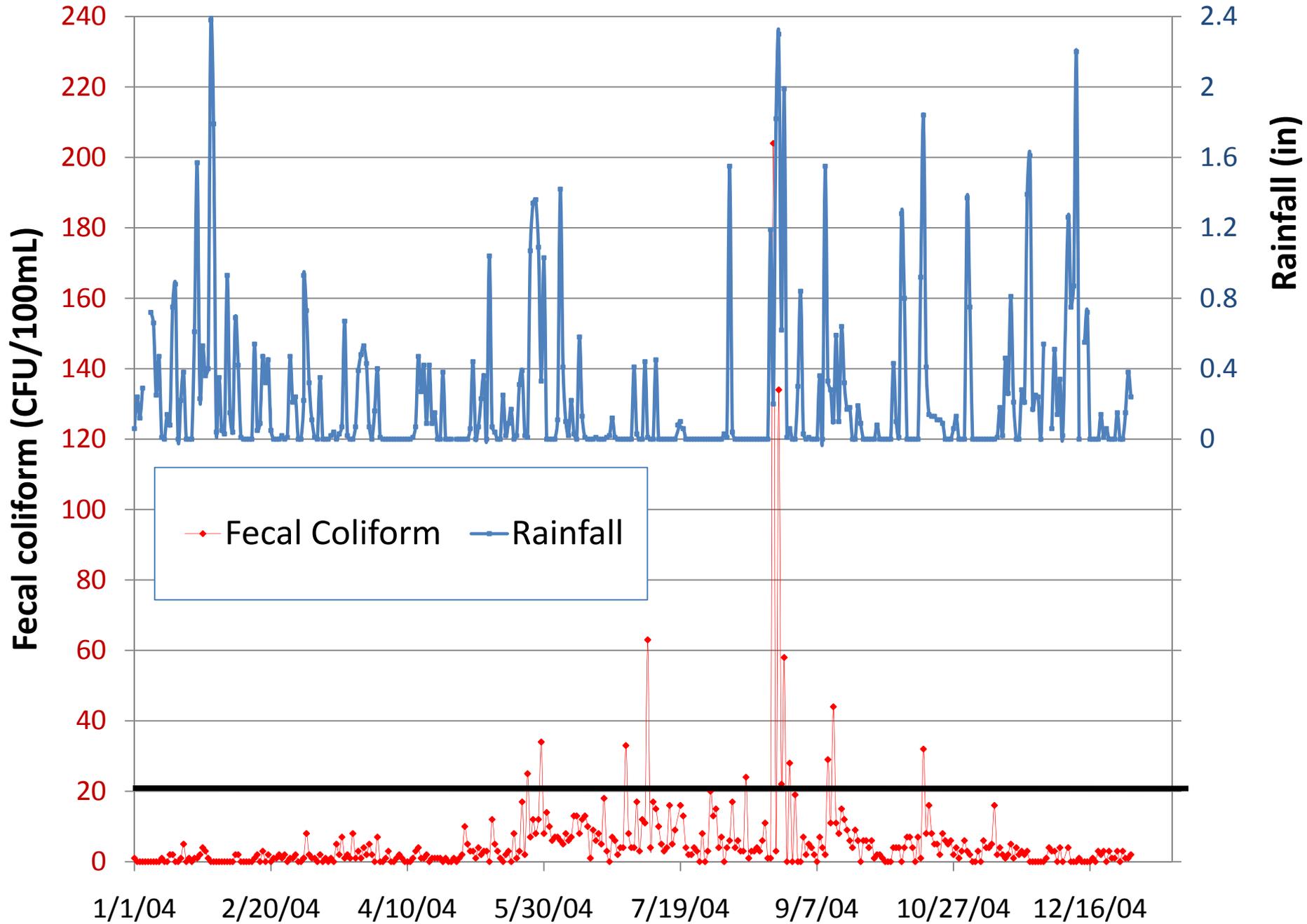
Original Surface Water Treatment Rule

- **Utility must filter unless it meets these criteria:**
 - **Source water Fecal Coliform limits (6 month running average)**
 - **Disinfection Byproducts below specific levels**
 - **Turbidity Limits**
 - **Watershed Control**
 - **Daily certified laboratory access**
 - **No waterborne disease outbreaks**
 - **Redundant disinfection equipment**
 - **Continuous chlorine in & throughout the system**
 - **Compliance with Coliform bacteria requirements**
 - **Annual inspection of watershed & treatment facilities**

Balancing the Risks

At the Source

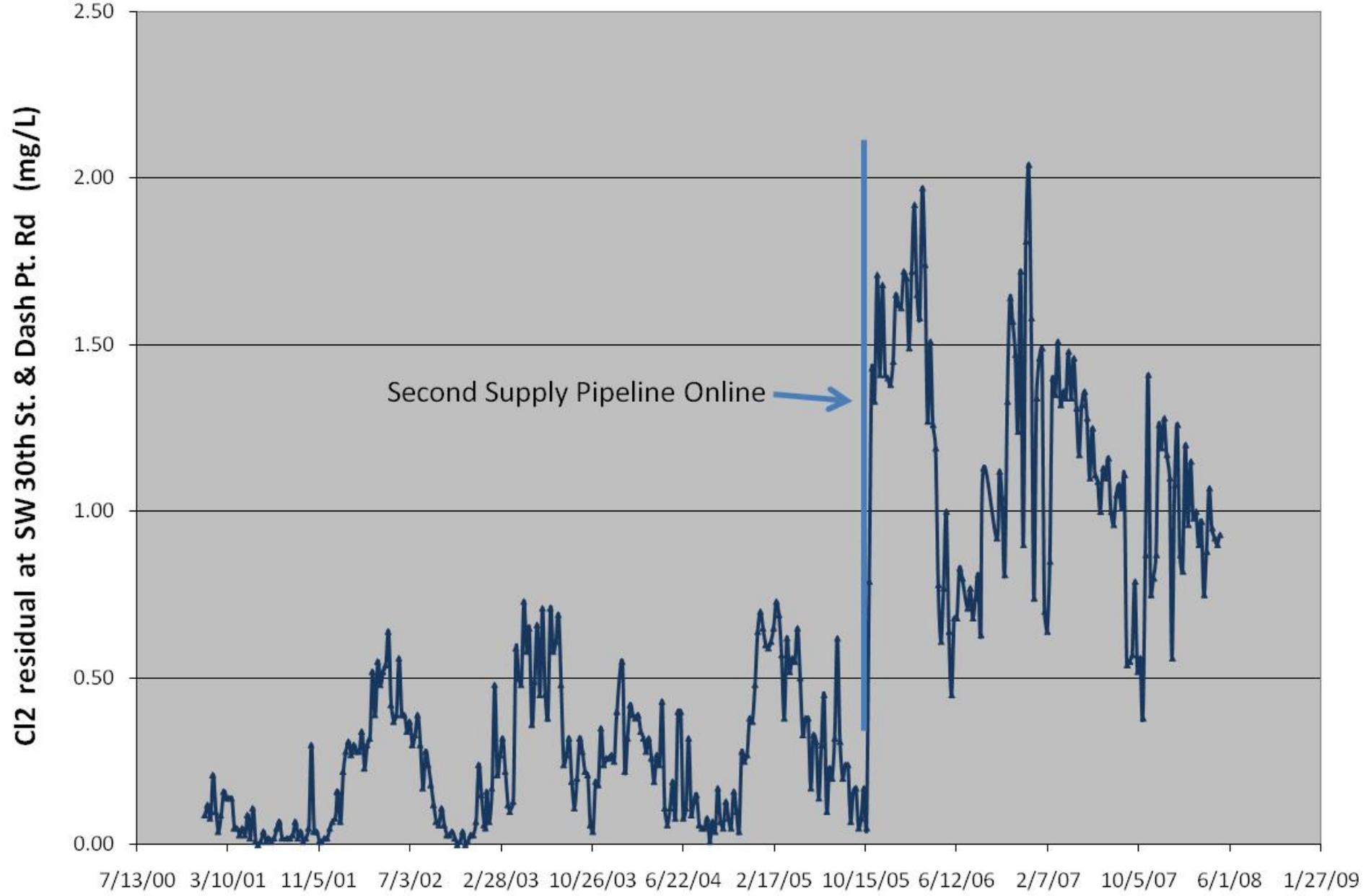
FECAL COLIFORM



At the Tap

DISINFECTION AND IT'S BYPRODUCTS

Distribution Chlorine Residual



Total Haloacetic Acid 5 Running Annual Averages

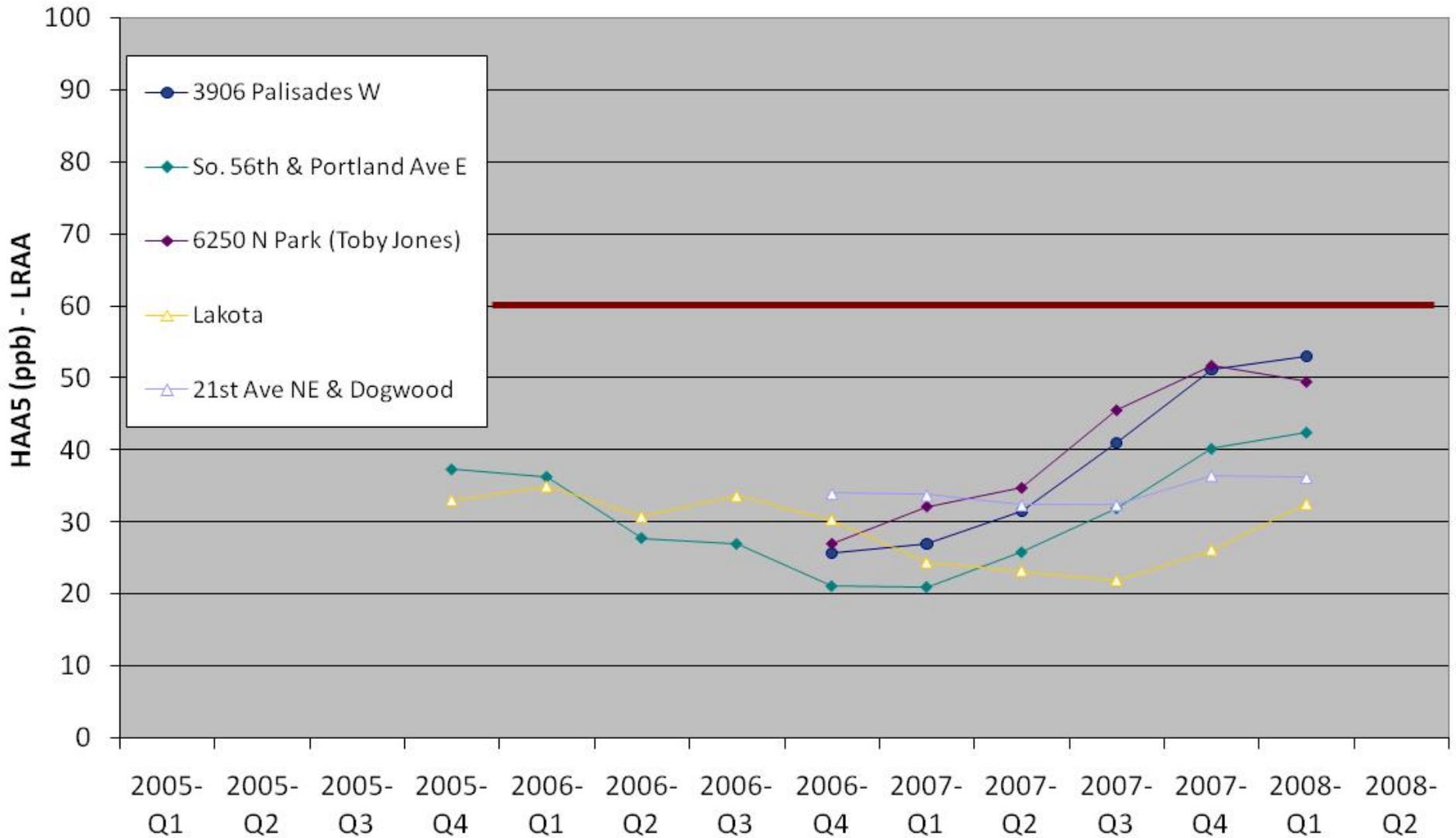
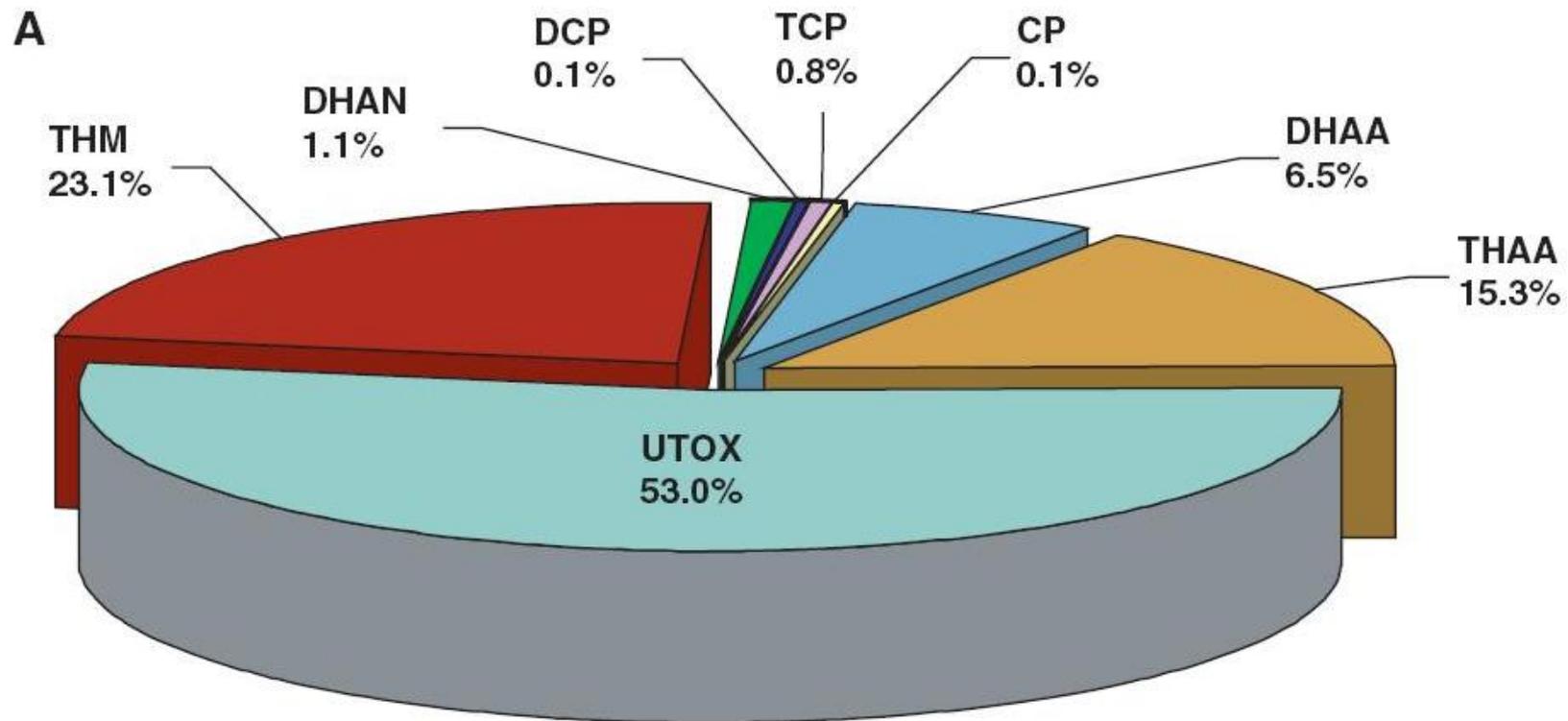


FIGURE 7 TOX distributions in chlorination (A)* and chloramination (B)†



Hua & Reckhow, *JAWWA* 100:8 August, 2008

In the System

TURBIDITY AND ITS BYPRODUCTS

Pipeline Velocity with Flow - 72"

Turbidity: 0.8 NTU – 3.5 NTU (Avg=0.8 NTU)

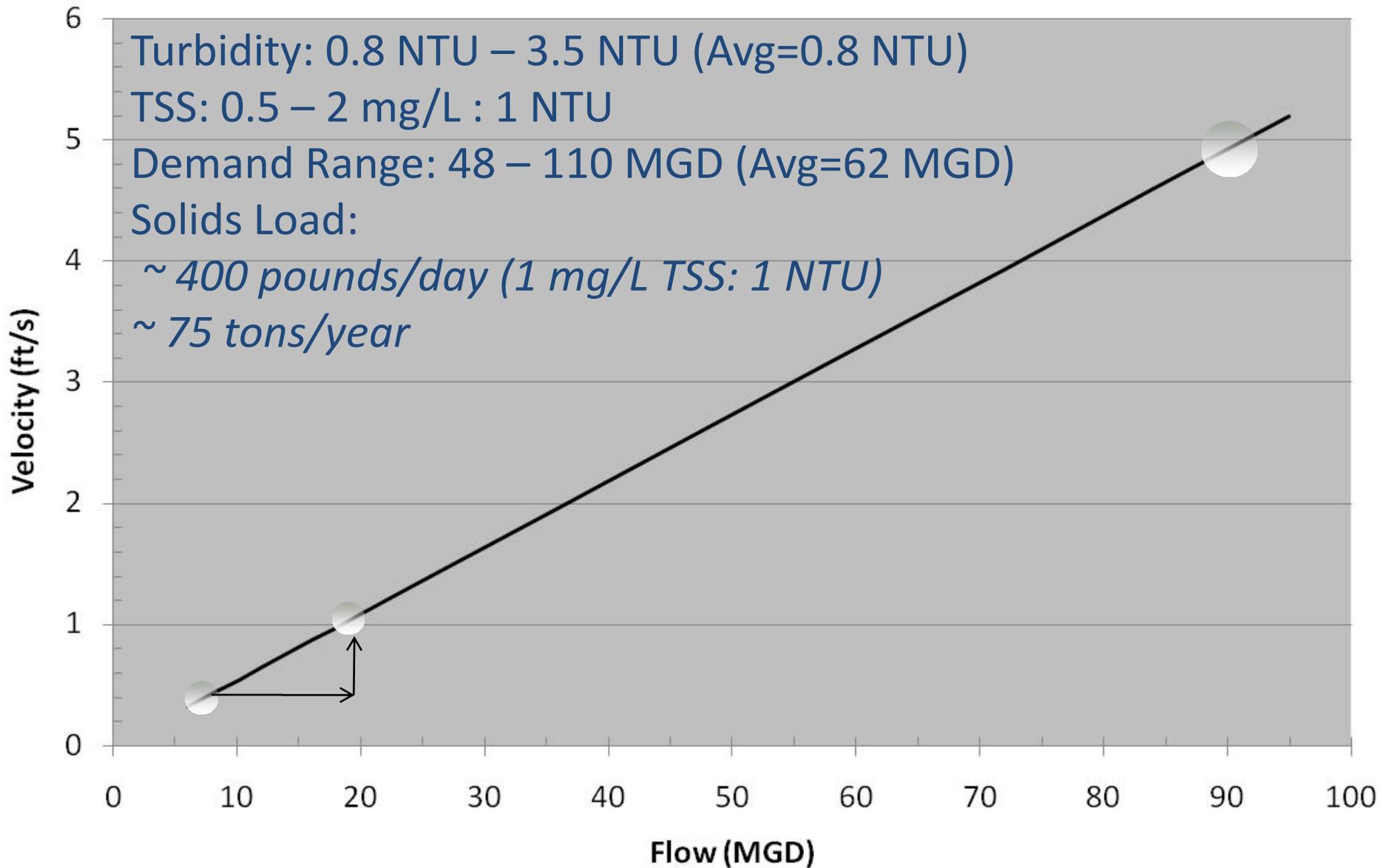
TSS: 0.5 – 2 mg/L : 1 NTU

Demand Range: 48 – 110 MGD (Avg=62 MGD)

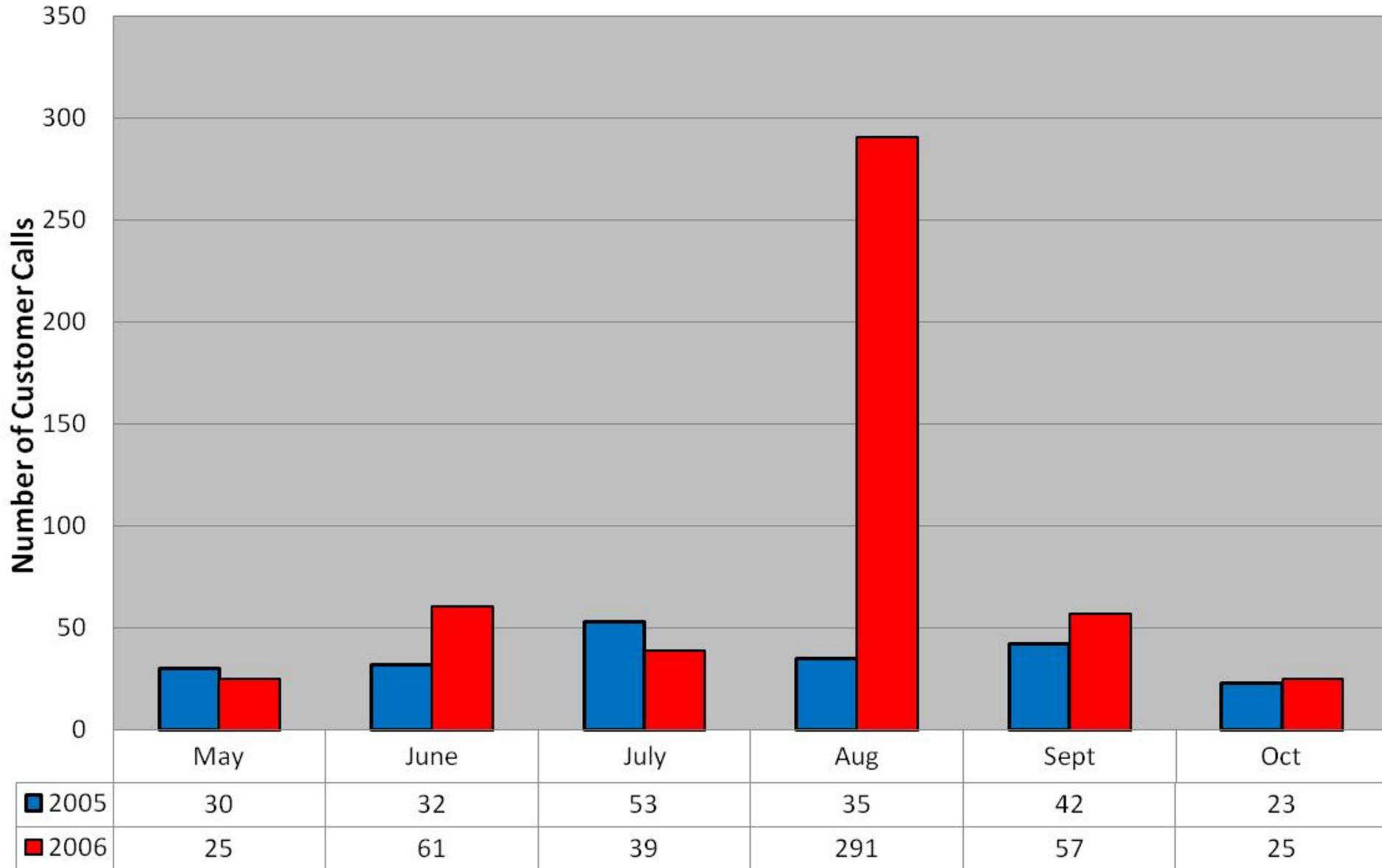
Solids Load:

~ 400 pounds/day (1 mg/L TSS: 1 NTU)

~ 75 tons/year



"Brown/Dirty Water" Calls



Options

**UV OR FILTRATION, AND THEIR
VARIATIONS**

UV light disinfection

- **Estimated cost**

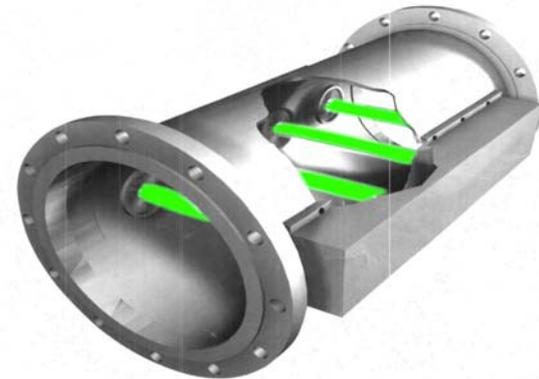
- Preliminary capital cost = \$60 M (2008 dollars)

- **Benefits**

- Improves disinfection barrier
- Meets current regulation
- Lower upfront capital & operating expense

- **Risks**

- Filtering the Green River may still be necessary.
- Disinfection byproduct levels may increase with more storage & completion of the Army Corps' fish passage facility.
- Iron & manganese levels will continue to cause seasonal discoloration in the Green River supply & constrain UV disinfection treatment.



Filtration

- **Estimated cost**

- Preliminary capital cost = \$140 M (2008 dollars)

- **Benefits**

- Meets current regulatory requirements
- Reduces sediment load to the system 100 X
- Substantially improves protection of public health
- Positions utility to meet future treatment requirements
- Reduces organic material, disinfection byproducts & color
- Provides additional yield from the Green River, particularly in fall & early winter

- **Risks**

- Will have a higher impact on rates compared to UV treatment
- Will create competition for resources with other system needs



Schedule

Conclusion of LT2 required

Cryptosporidium monitoring (10/08)

Presentations to PUB and City Council, City of Kent, Covington Water District, Lakehaven Utility District & public (Multiple - 2009)

Public Utility Board and RWSS Partner decision (1/10).

Deadline for installation of *Cryptosporidium* treatment per LT2 w/ 2 year extension (4/14)

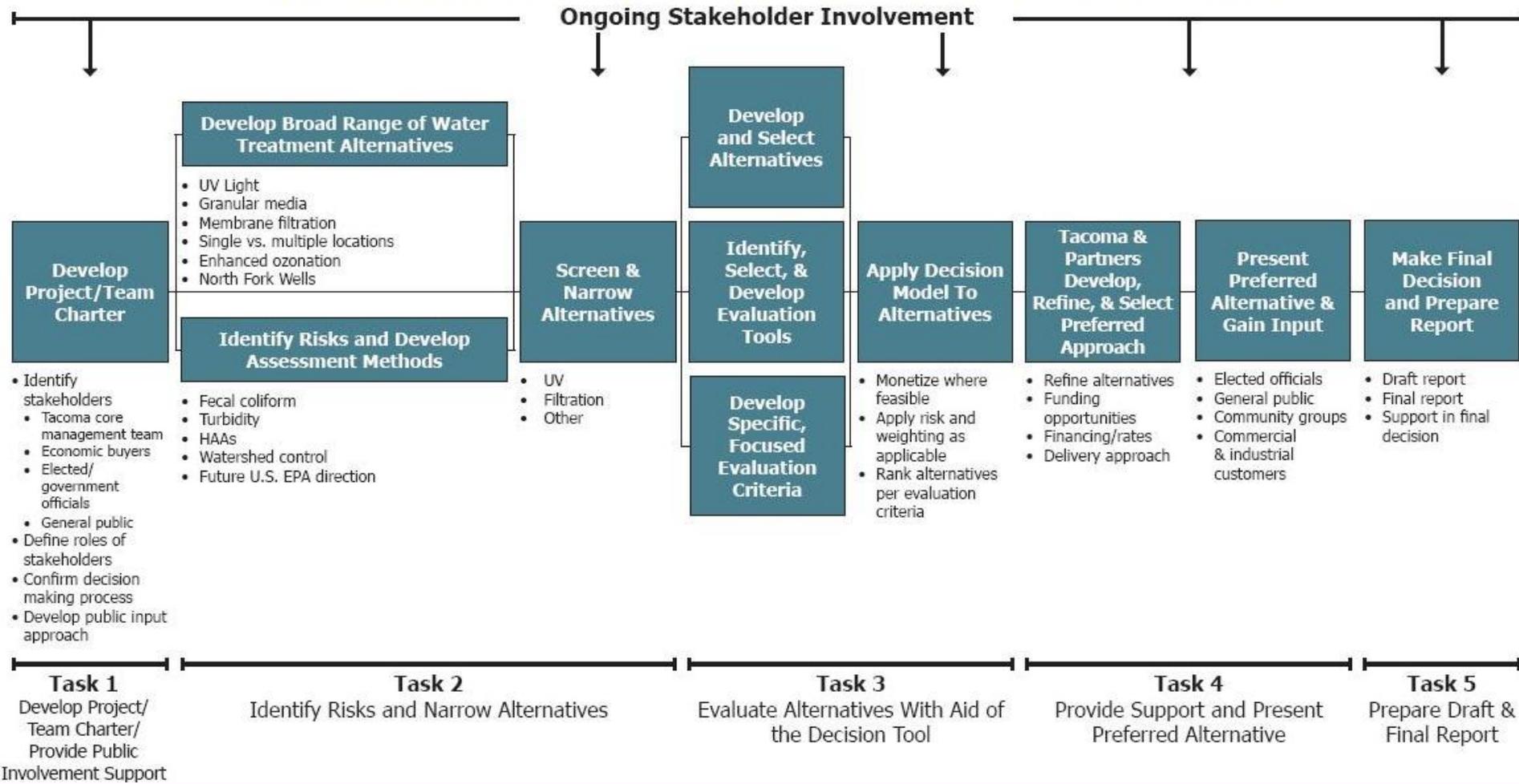
Anticipated Operation of Fish Passage from Howard Hanson Dam (20??)



Advertise RFP for consulting services for decision process (2/09)

RWSS= Covington Water District, City of Kent, and Lakehaven Utility District

TACOMA WATER TREATMENT DECISION PROCESS FLOW CHART



HDR / CH2MHILL Process chart

Summary

- Compliance with the federal LT2 rule requires a treatment response.
- This important decision requires additional information and input both for and from the public, Public Utility Board and City Council.
- The process we have identified will drive toward an informed, risk –based decision.
- Our objective is to complete the decision-making process by January 2010.

What does the Future hold?

UV

Filtration

- Other Critical Infrastructure
- Customer perception and reality



Cost

Timing

Quality

Reliability

Certainty

