



Wisconsin Government Affairs
Seminar
**Chlorides-Regulatory Overview
and Successes**

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Overview of Presentation

- Chlorides Criteria Development
- Chloride Regulations in Wisconsin
- Approach to Compliance
- Successes



**Madison Metropolitan
Sewerage District**

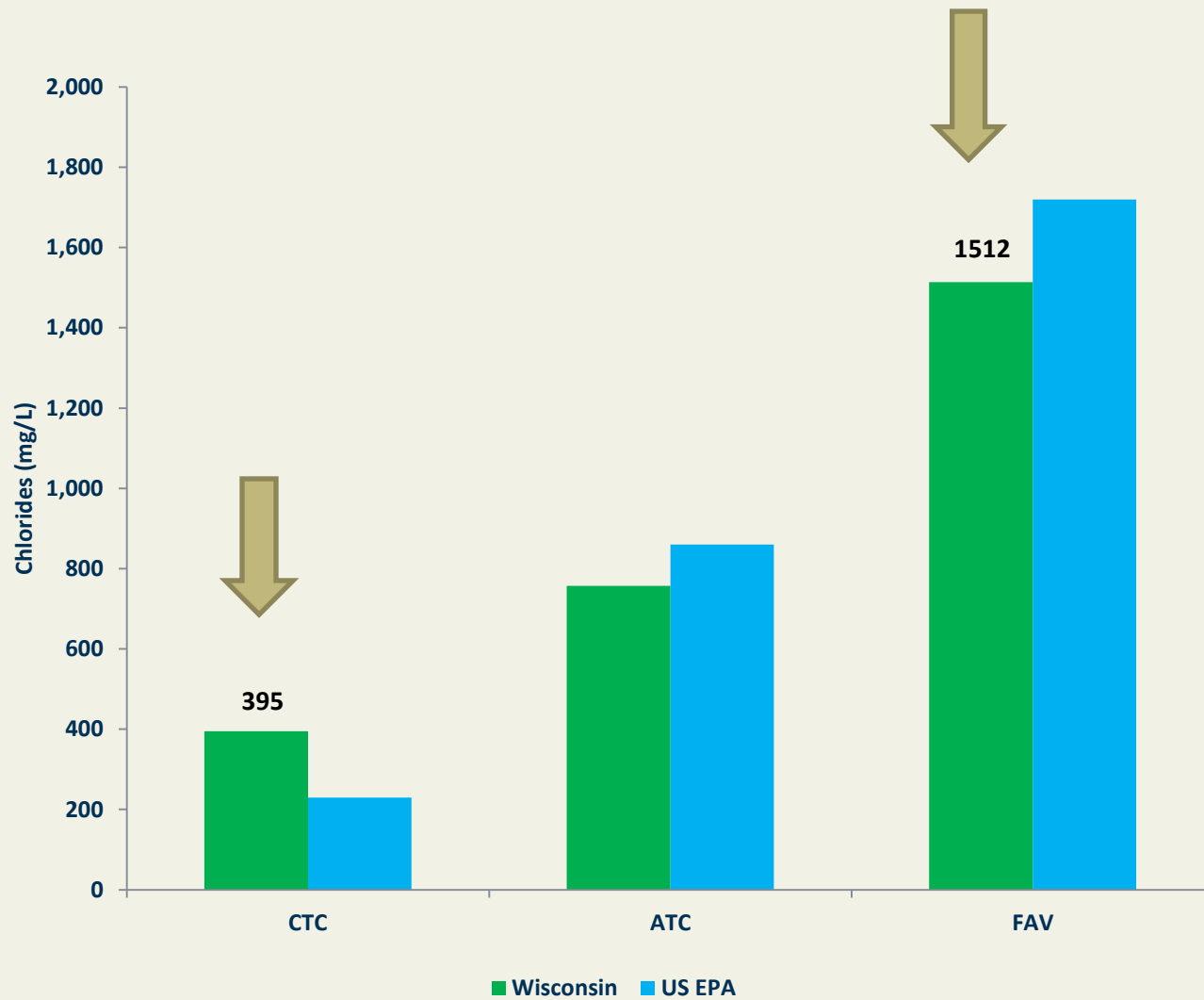


Paddock Lake, WI

Acronyms

ACR-Acute Chronic Ratio
ATC-Acute Toxicity Criteria
DAF-Design Average Flow
DIR-Demand Initiated Regeneration
CTC-Chronic Toxicity Criteria
FAV-Final Acute Value
MEG-Municipal Environmental Group
WDNR-Wisconsin DNR
WER-Water Effects Ratio
WET-Whole Effluent Toxicity
WQBEL-Water Quality Based Effluent Limits

Chloride Criteria in Wisconsin



US EPA Criteria Development



Daphnia Pulex



Fathead Minnow



Rainbow Trout-(Non-Native in Wisconsin)

Chloride Criteria

1988 US EPA Standard

Controlling Species-Daphnia Pulex

Species Tested-Acute

Snails

Clams

Daphnia Magna

Daphnia Pulex

Caddisfly

Rainbow Trout

Fathead Minnow

Bluegills

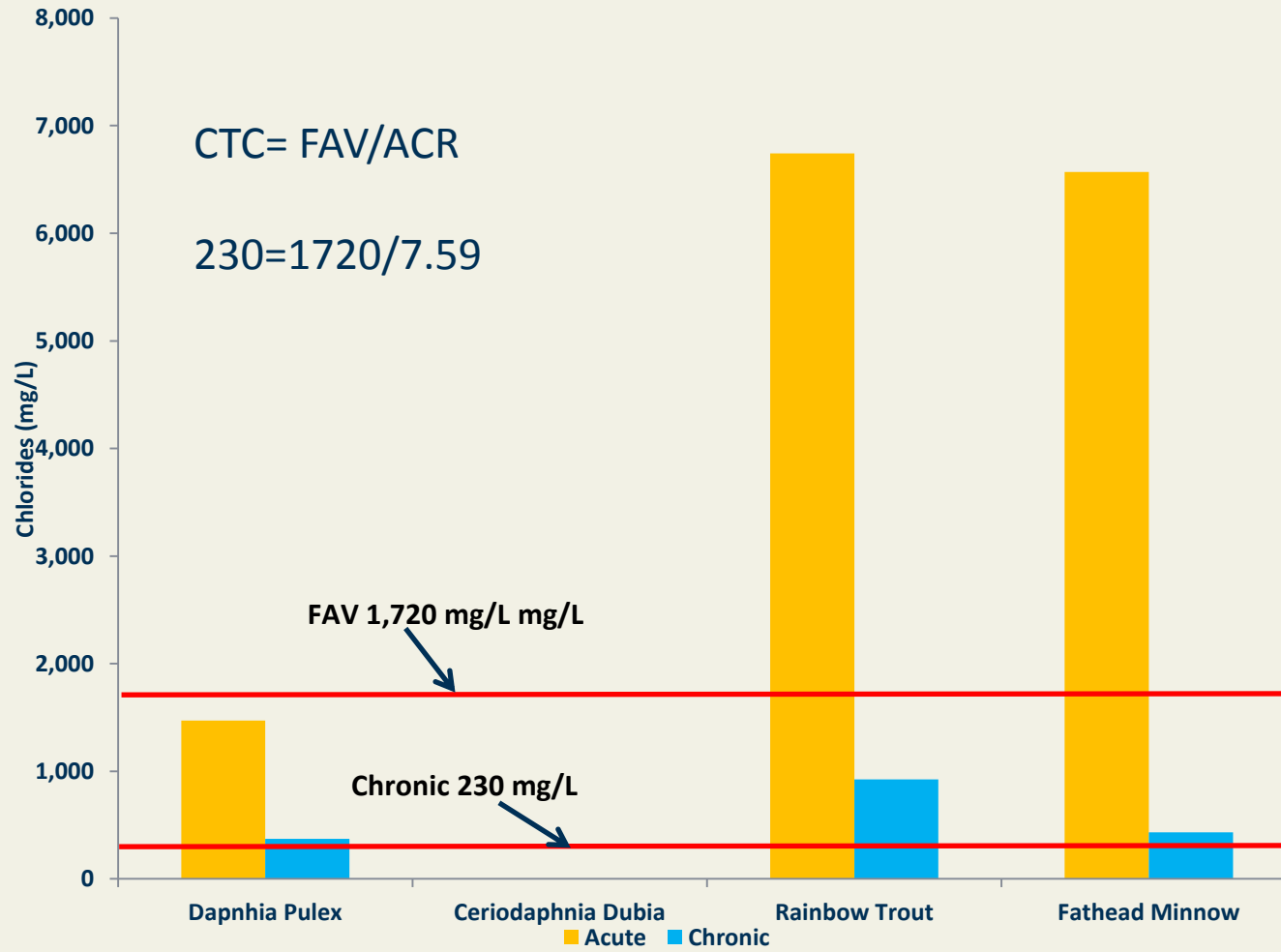
Species Tested-Chronic

Daphnia Pulex

Rainbow Trout

Fathead Minnow

Basis for Criteria-US EPA



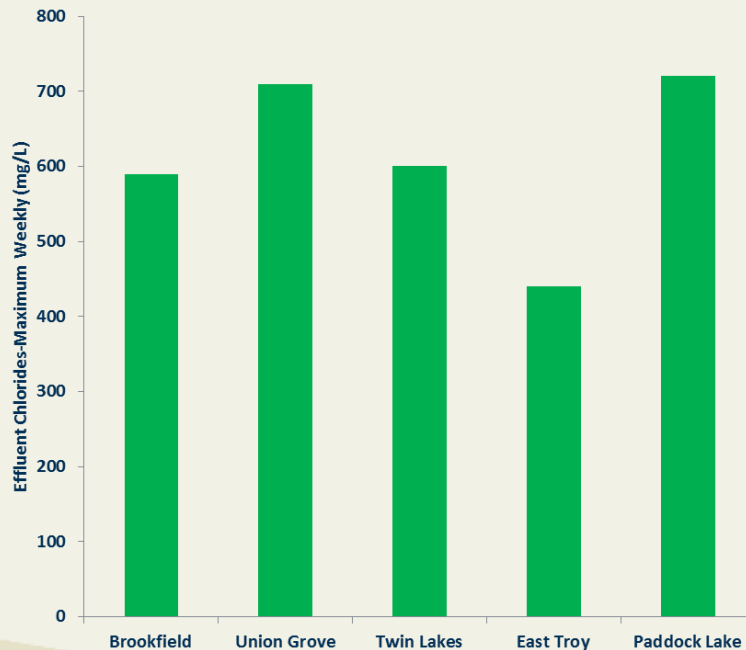
Development of Wisconsin Criteria

Added Ceriodaphnia Dubia

Applicable to All Waters-Ceriodaphnia Dubia Controls

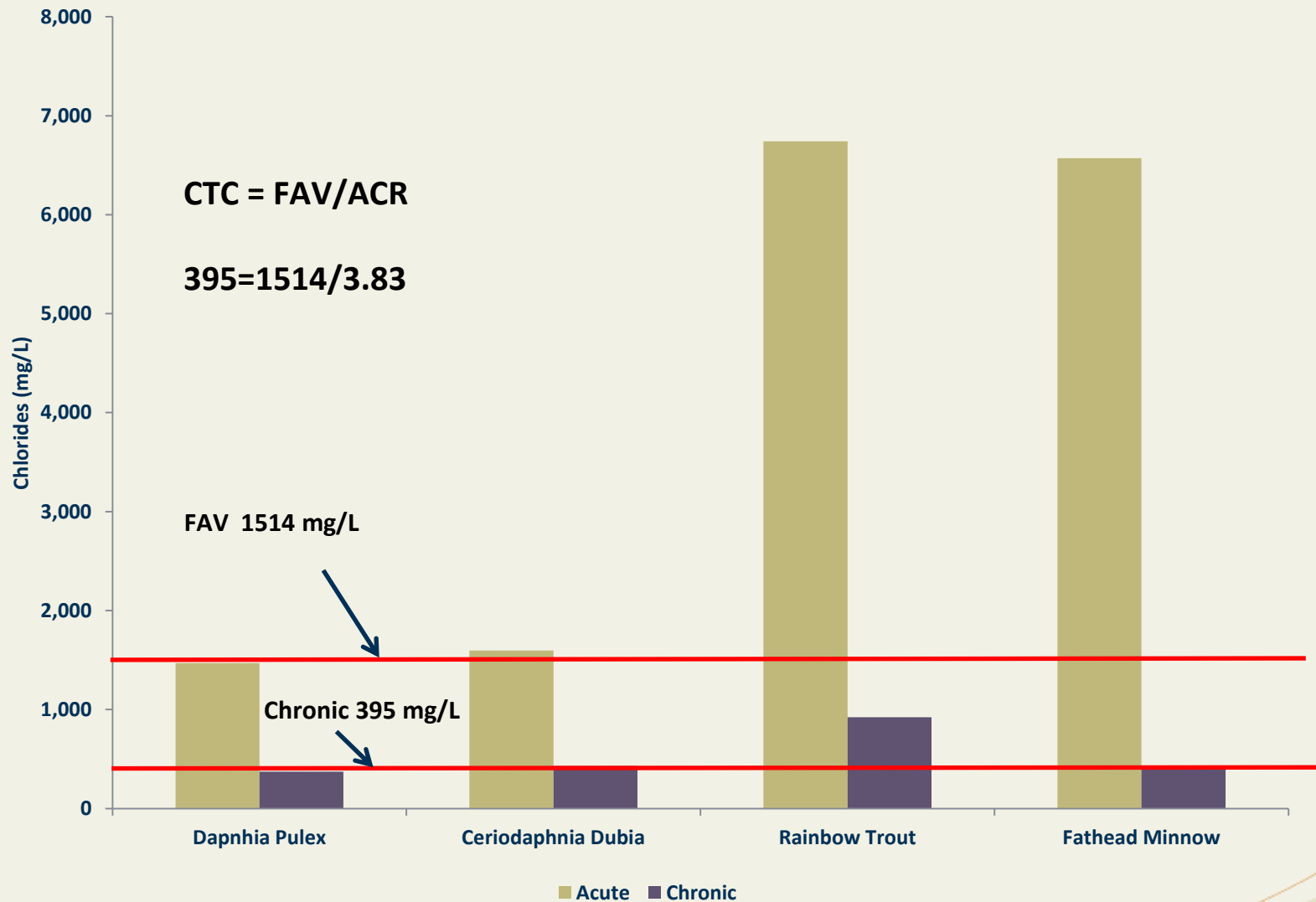
Test Species for WET

Robust Chlorides Chronic Toxicity WET Data Base



96 Variances for
Chlorides (38 %)

Basis for Criteria-Wisconsin



WPDES Implementation

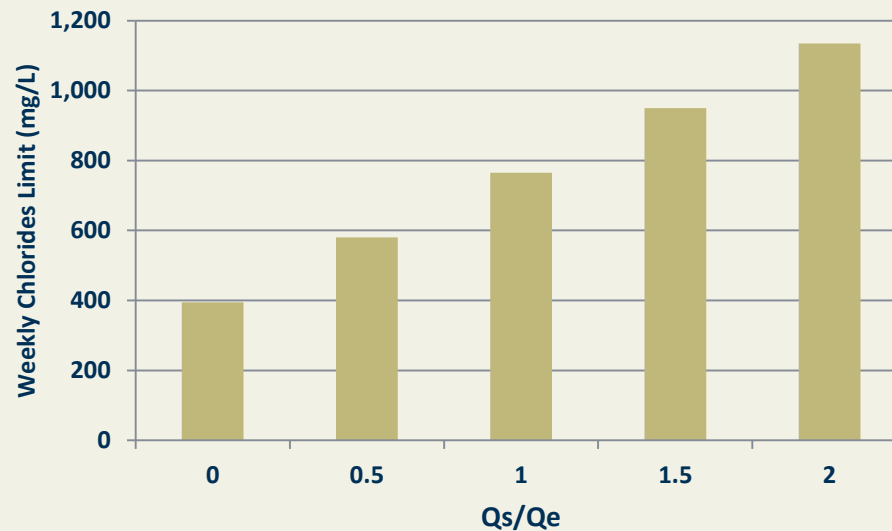
Acute-Final Acute Value (Rare)

Chronic-Chronic Toxicity Criteria (38 % of All WPDES Municipal Permits)

¼ 7Q10-Dilution

Criteria 395 mg/L

Limitation = $((WQC) (Q_s + (1-f)Q_e) - (Q_s - fQ_e) (C_s)) / Q_e$



WPDES Permit Implementation

Multi-Discharger Variance (Economic)
Interim Limit (p 99-Statistical Calculation)
Target Limit
Set of Conditions

Optimization Actions-Tier 1 (Permit Term 1)

Identify Sources of Chloride to Sewer System

Homeowner Education

Recommend Voluntary Residential Softener Tune-Ups

Voluntary Support from Local Water Softening Business

Educate Installers

Voluntary Industrial, Commercial and Institutional Contributors

Public Water Utility Softening Audits

Dairy, Meat and Vegetable Audits

Optimization-Tier 2 (2nd Permit Term)

Mandatory Review of Industrial, Commercial and Institutional Contributors

Mandate a DIR and High Salt Efficiency for New Residential Softeners

Mandate Participation in Residential Softener Tune-Up Program

Public Water Utility

Optimize Softener Operation

Switch to DIR Controller

Evaluate Feasibility of Brine Regeneration

Mandatory Requirements for Dairies and Vegetable Processors

Optimization Tier 3 (Third Permit Term)

Residential Softening-Metered Demand Type

Eliminate Outside Hose-Bib Softening (New Homes on Real Estate Transfers)

Centralized Water Softening

Evaluate Feasibility of Greater Salt Efficiencies

Evaluate Alternatives to Sodium Cycle Ion Exchange

Blend Softened and Unsoftened Water (Customer Satisfaction)

Dairies

Vegetable Processing

Meat Processing

Fourth Permit Term ?

Meeting WQBEL Limit ?

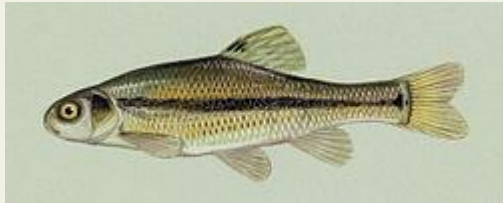
Yes-Continue with Optimization Processes

No

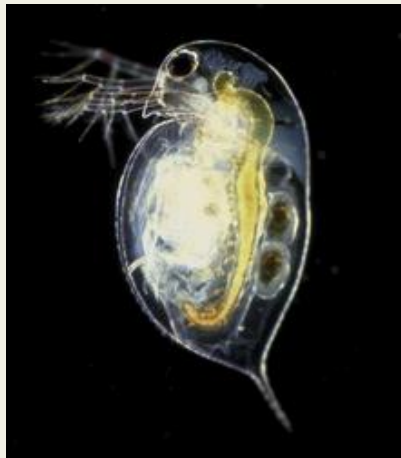
**Continue with Optimization Processes
Site Specific Limit (Optimized Performance)
Water Effects Ratio-Ceriodaphnia Controls**

Site Specific Limit-Water Effects Ratio (WER)

Lab Water



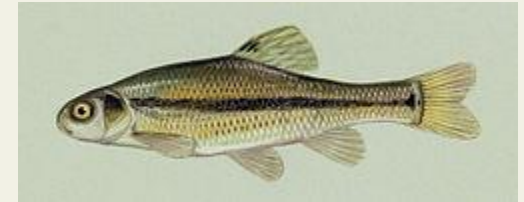
Fathead Minnow



Ceriodaphnia Dubia

**Hardness
Alkalinity
pH**

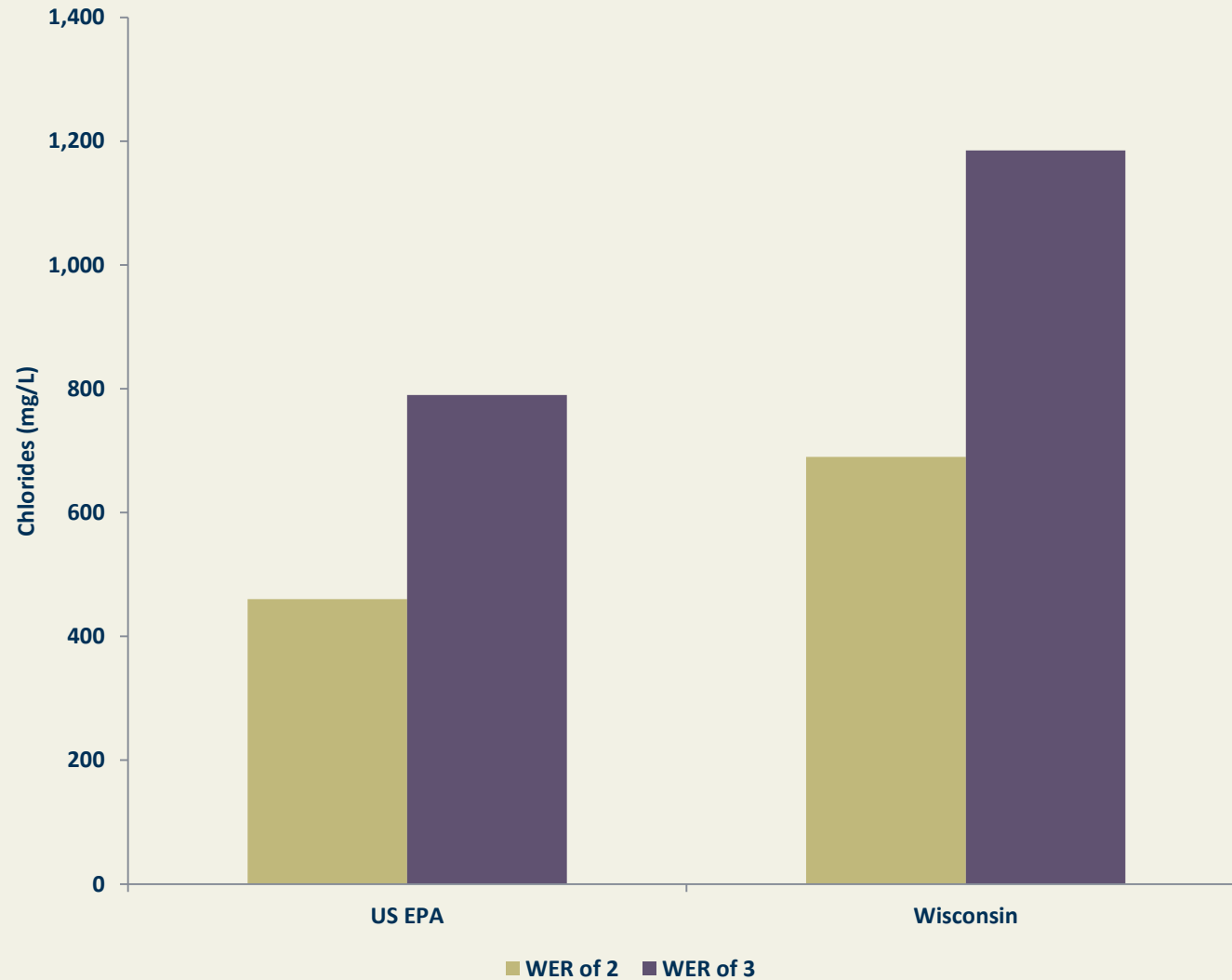
Simulated Water



**WER = Simulated/Lab
Acute
Chronic**

Lab Tests Hardness < 100 mg/L

Potential Site Specific Limit Using WER



Successes

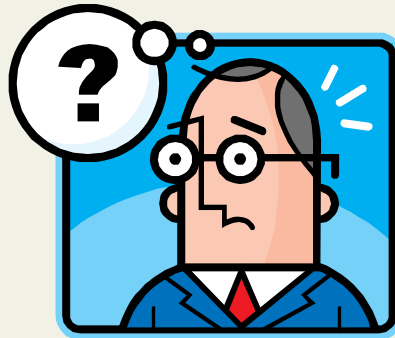
MEG & WDNR-Cooperative Efforts

Potential Basis for Non-Economic Variances in Illinois (US ?)

Madison Metropolitan Sewerage District-Kathy Lake

Paddock Lake, WI-Tim Popanda

Questions



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