



# Pacific Northwest Clean Water Association

Boise, Idaho

October 22, 2012

## Tale of Two Screens

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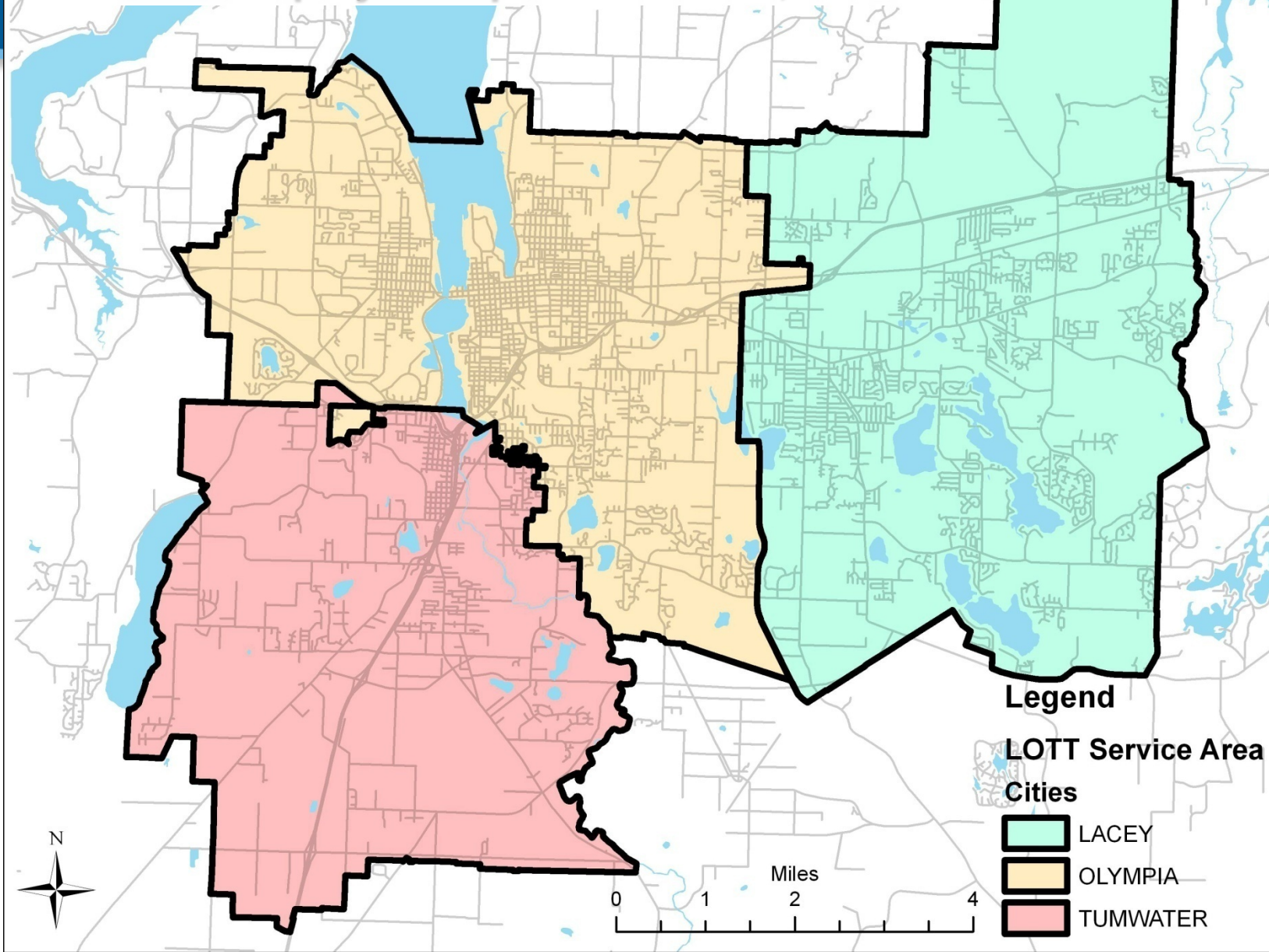


## Our Mission:

**Preserve and protect public health and the environment by cleaning and restoring water resources for our communities**



**Sewered Residential Population 103,309**  
**Sewered Employee Population 92,498**



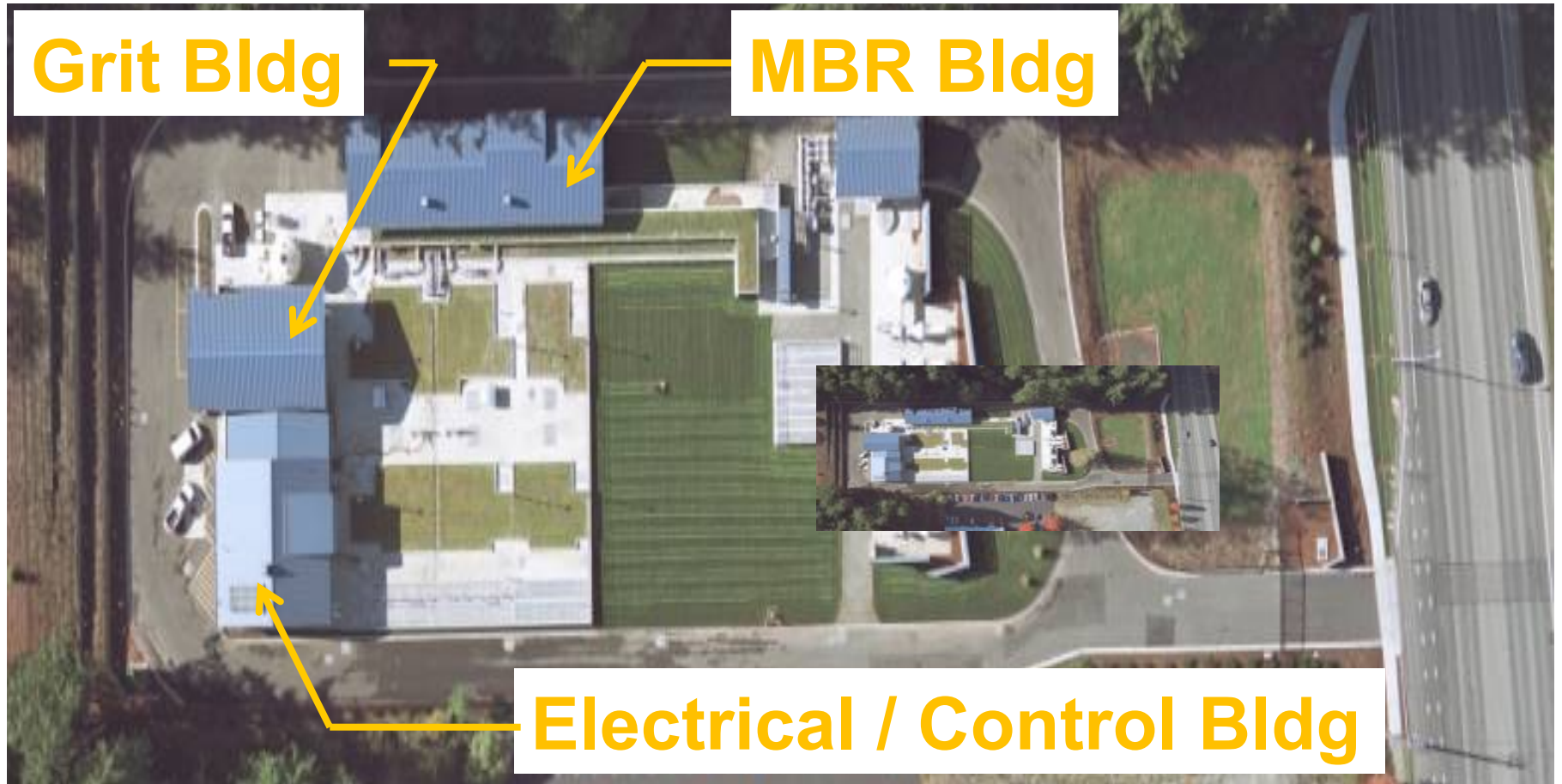
# Location of Facility



Martin Way  
**Reclaimed Water Plant**



# Martin Way Facility





# First Barrier In the Treatment Process

- Influent Screen
- 3 mm Perforated Plate
- Water Spray and Brush Cleaning





# Cleaning Mechanism



**Brush and Water Spray**



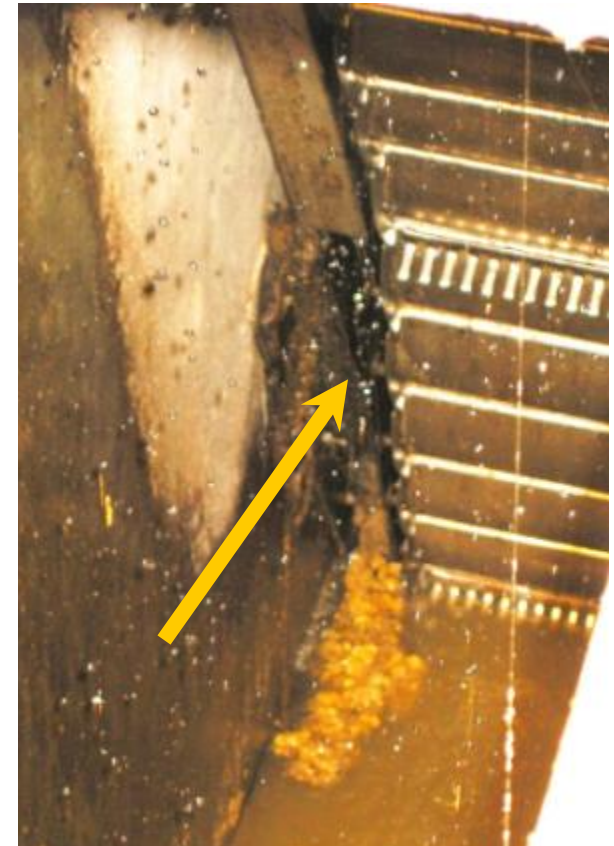
**Debris Carryover From Brush  
and Water Spray**



# Debris That Passes Around 3 mm Screen



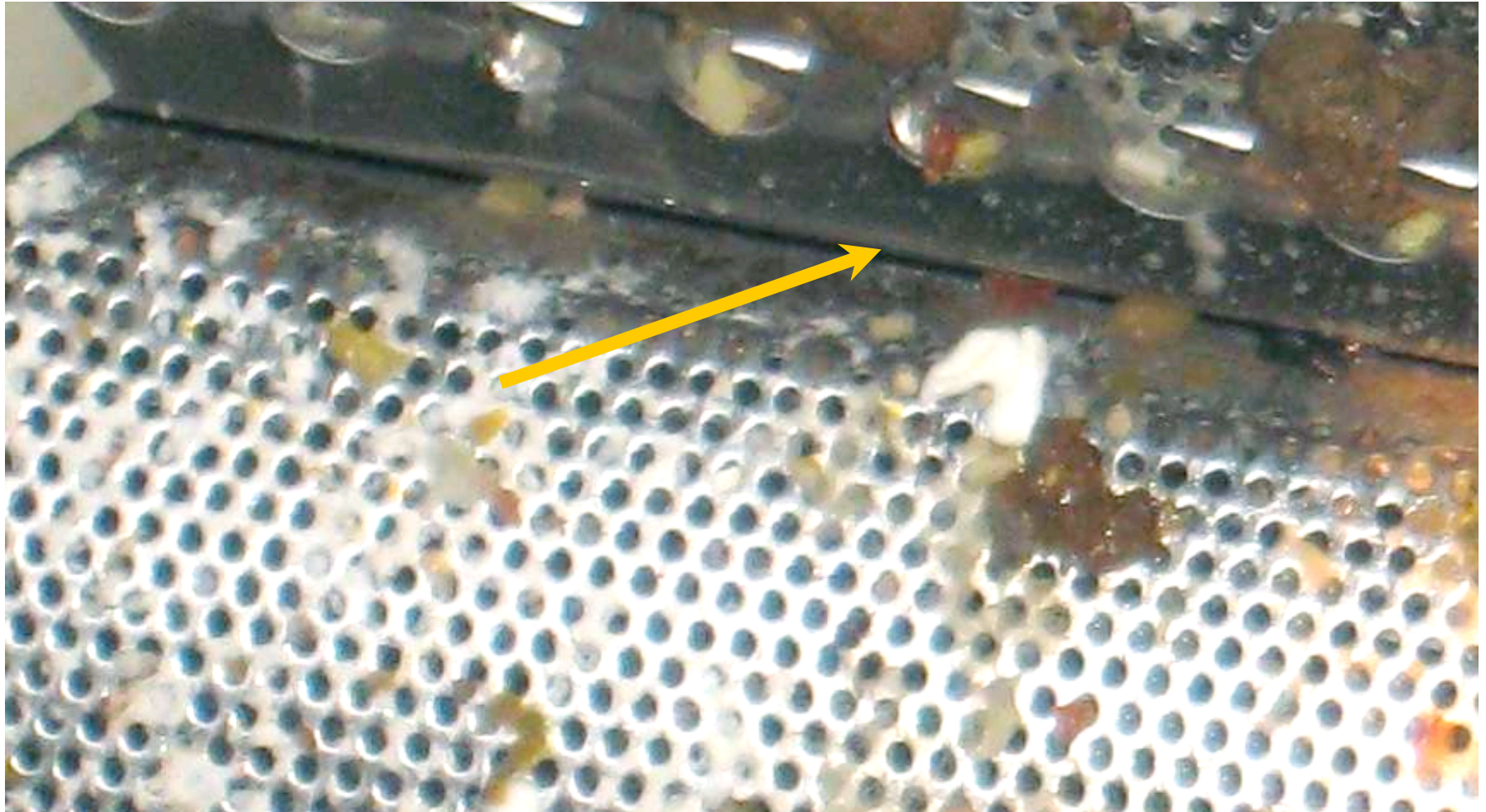
**Passage Around Edges  
of Plates and Frame**



**Contractor Forgot To  
Completely Grout between  
Frame and Channel**



# Gaps Between Plates



**Gaps between perforated plate panels**

# How Much Debris Really Gets By The 3 mm Screen



**After 2 hours in the  
Screened Sewage**



**After 18 hours in the  
Screened Sewage**

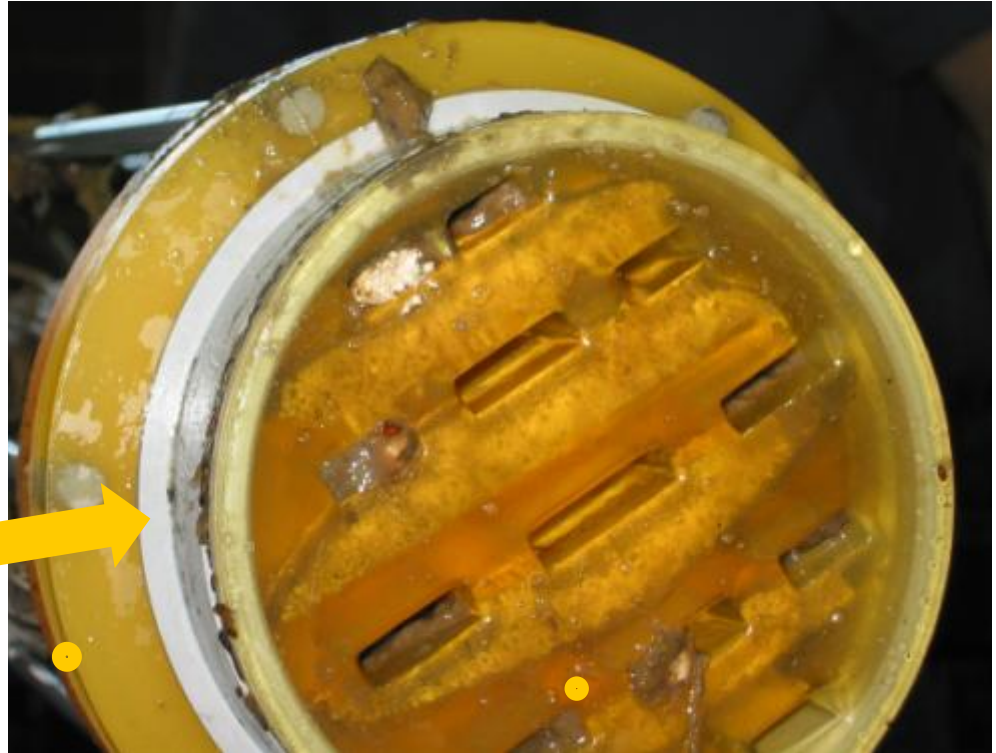


# What Happened in the MBR Facility ?



# Fouled Membrane Modules

**Top of Membrane Clover**

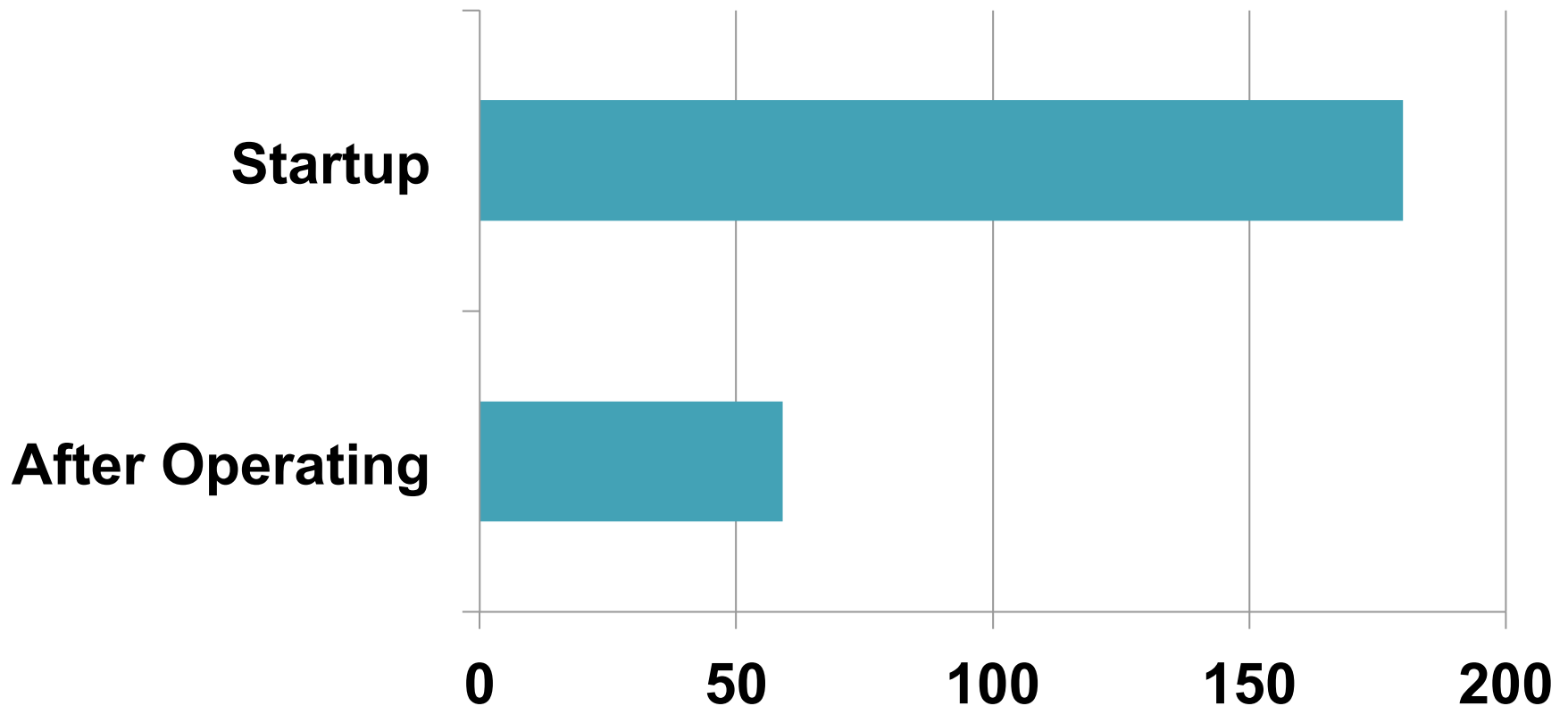


**Rack End of Module**



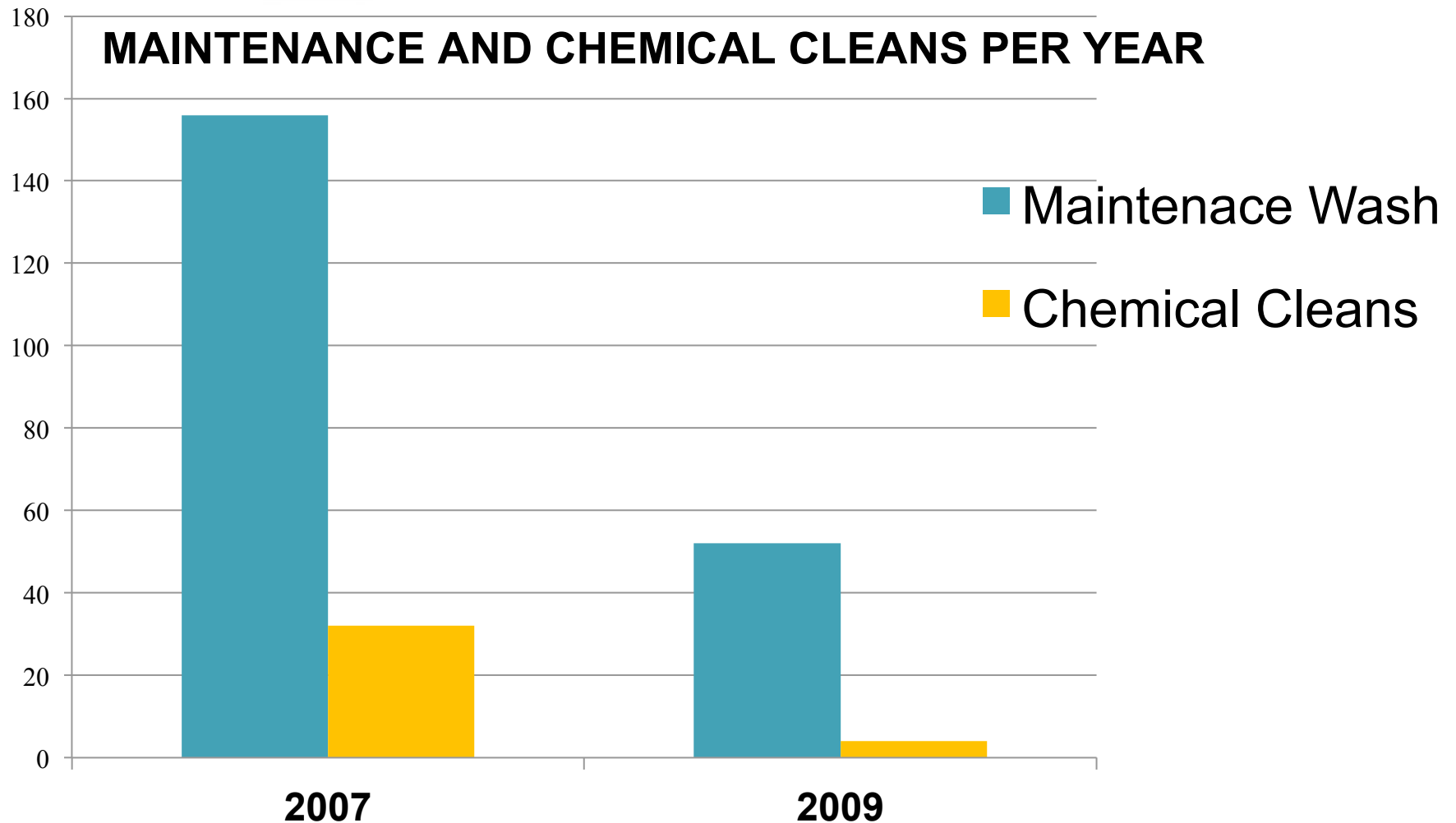
# Loss of Performance

## Membrane Permeability lmh/bar



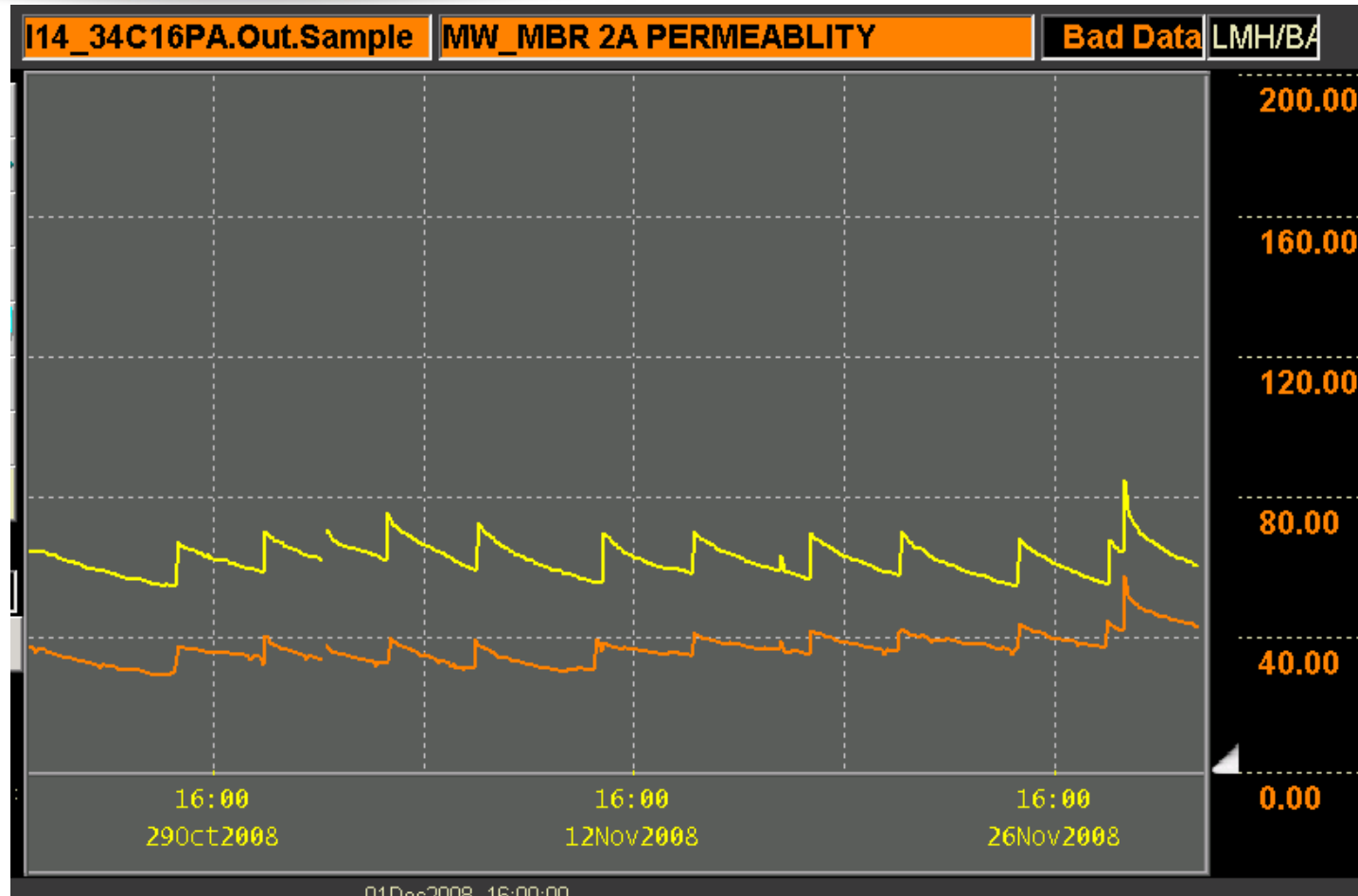
# Excessive CIP's

## *Screen Operational July 2008*





# Loss of Permeability and Increased CIP's due to Fouling



- Maintenance washes 2-3 times per week
- After new screen installation, permeability starts to increase

# Resolution To Membrane Fouling

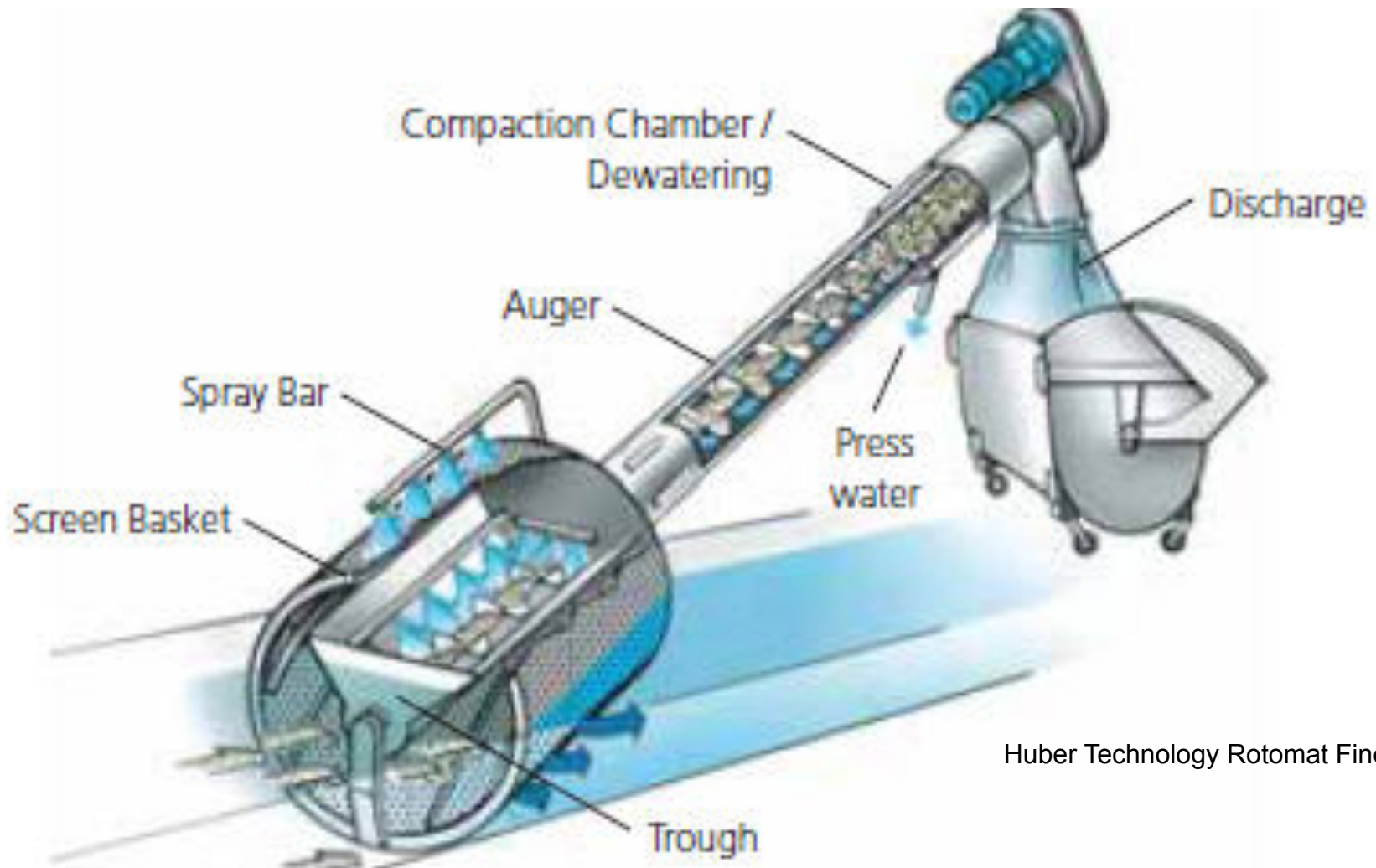


**Design and Install a Screening Facility in the Existing Grit Room**



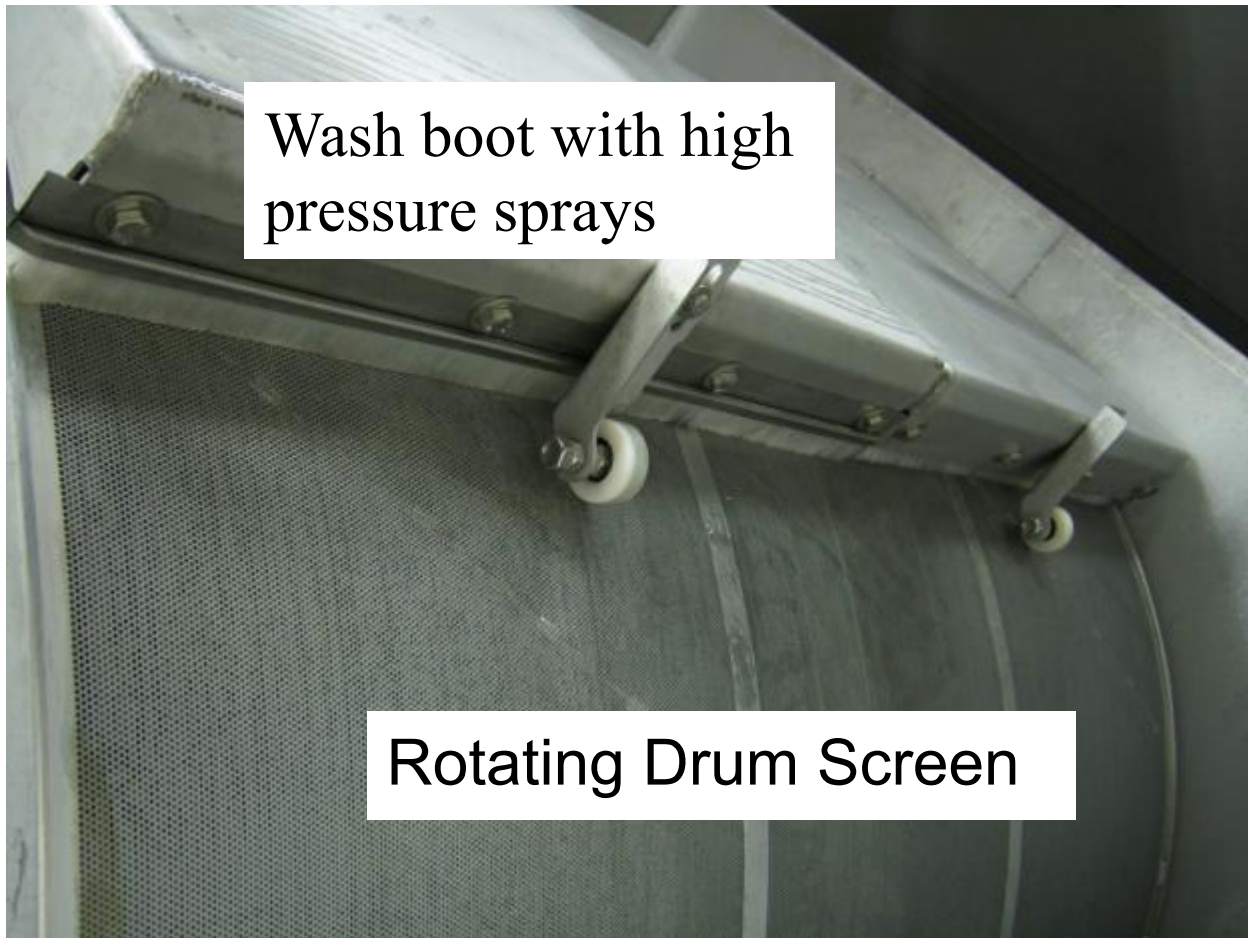
# Solution

## *Fine Basket Screen*



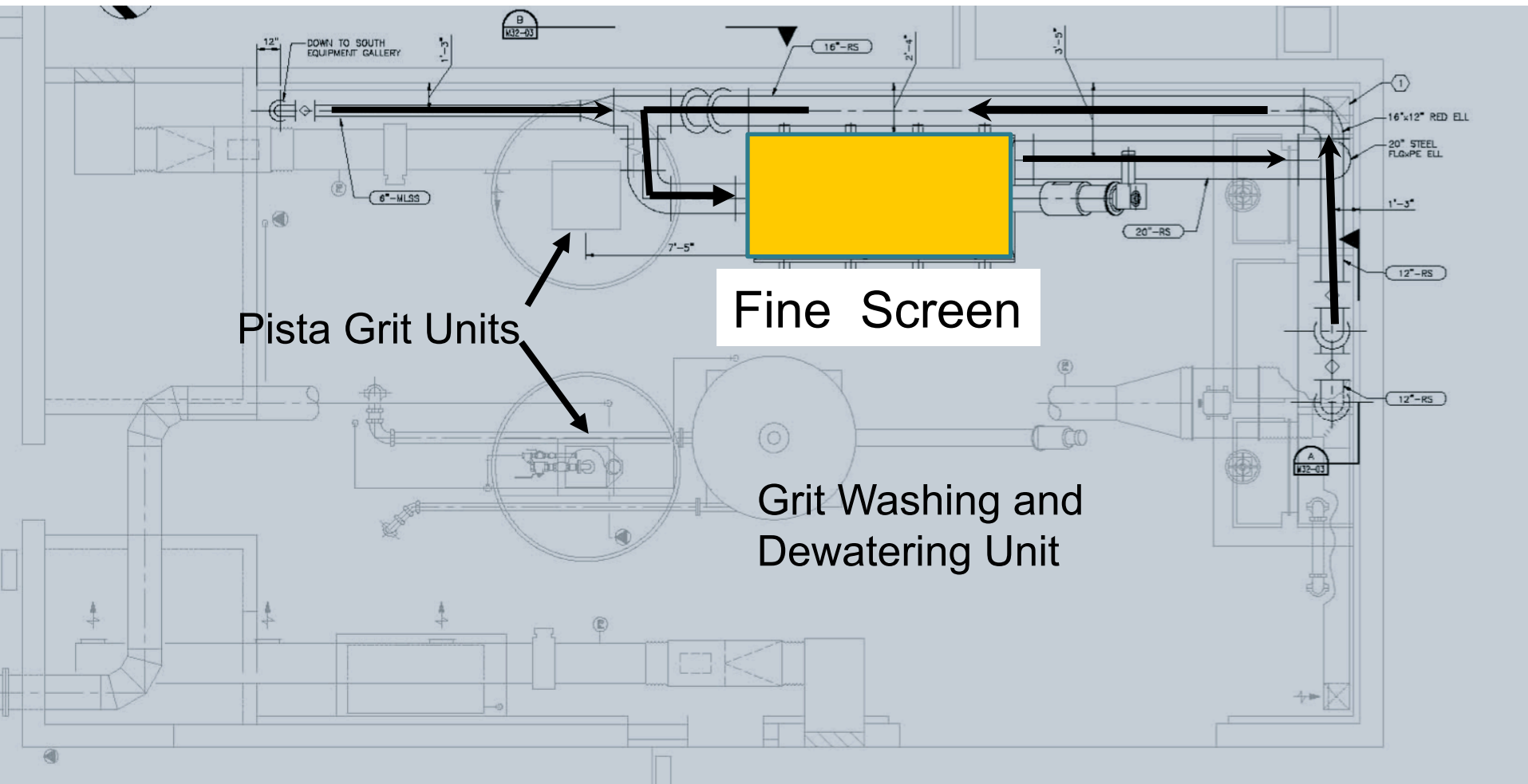
Huber Technology Rotomat Fine Screen

# Screen Construction





# Plan of Screen Installation



# Screen Installation in Progress



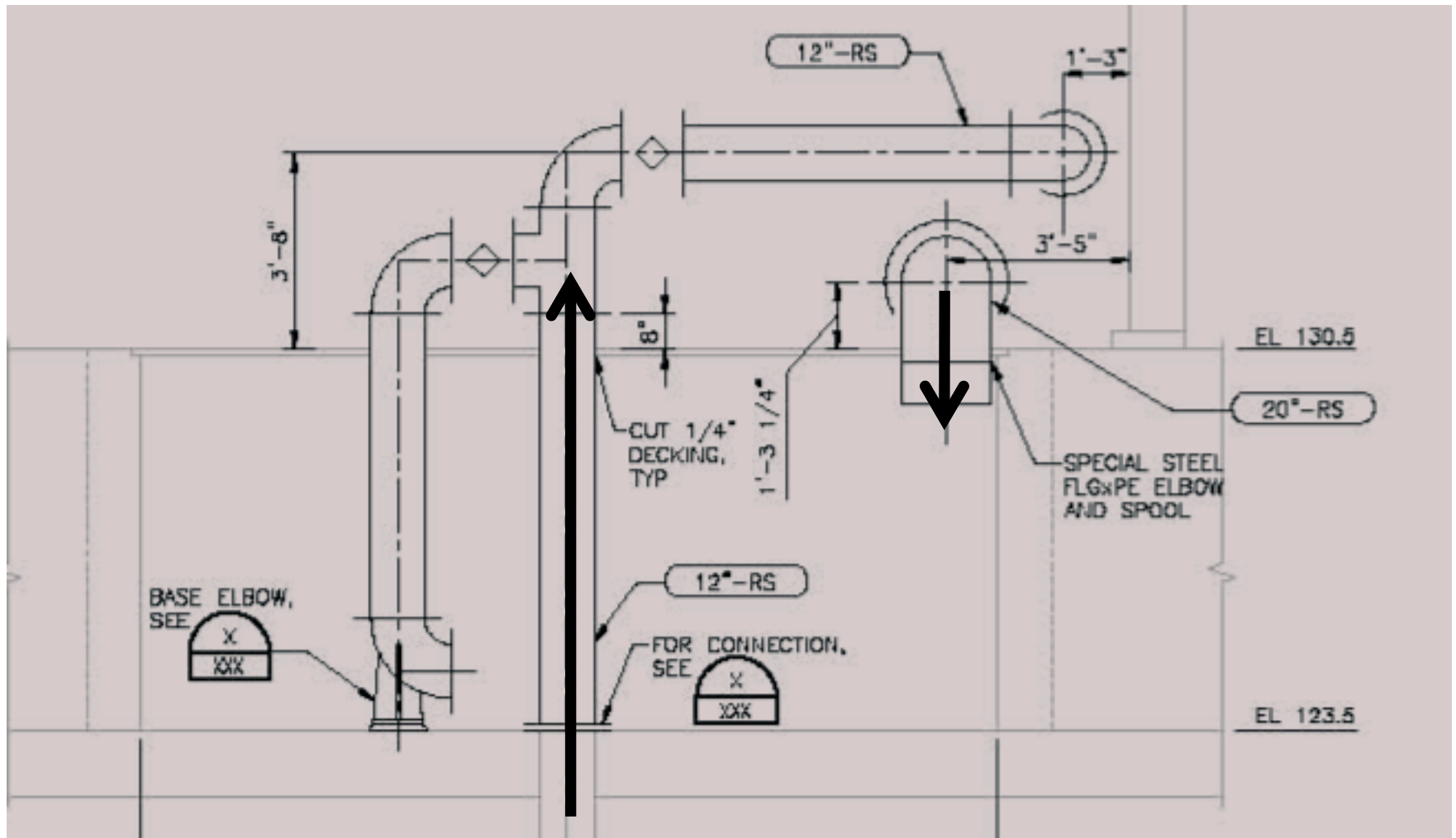
**Screen Effluent**



**Screen Influent**



# Sectional Plan of Influent/Effluent Piping



# Influent and Effluent Piping





# Finished Screen Installation



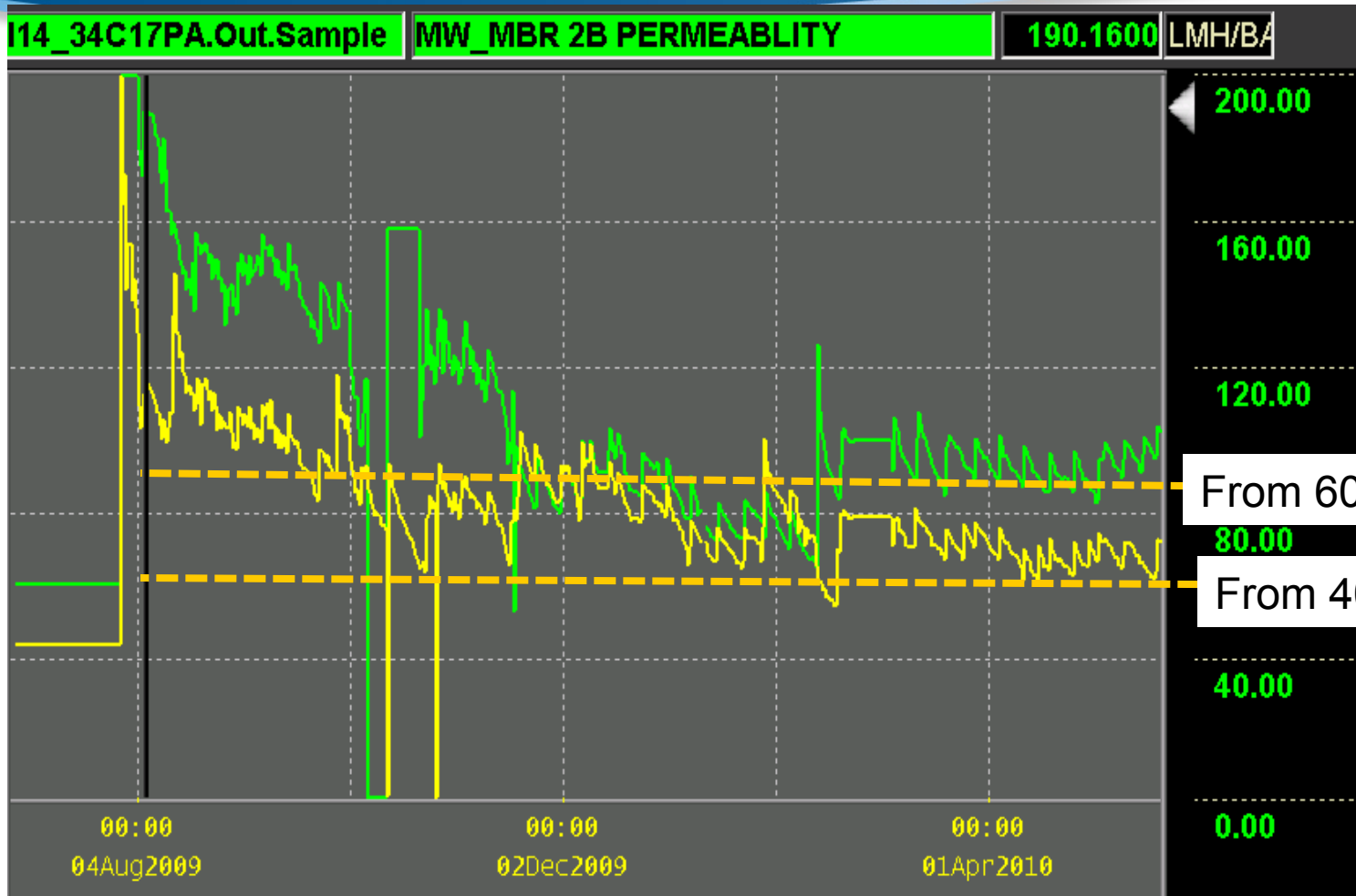
# Fine Screen Removes Additional 1 ½ Yards of Material per Week (<1MGD)



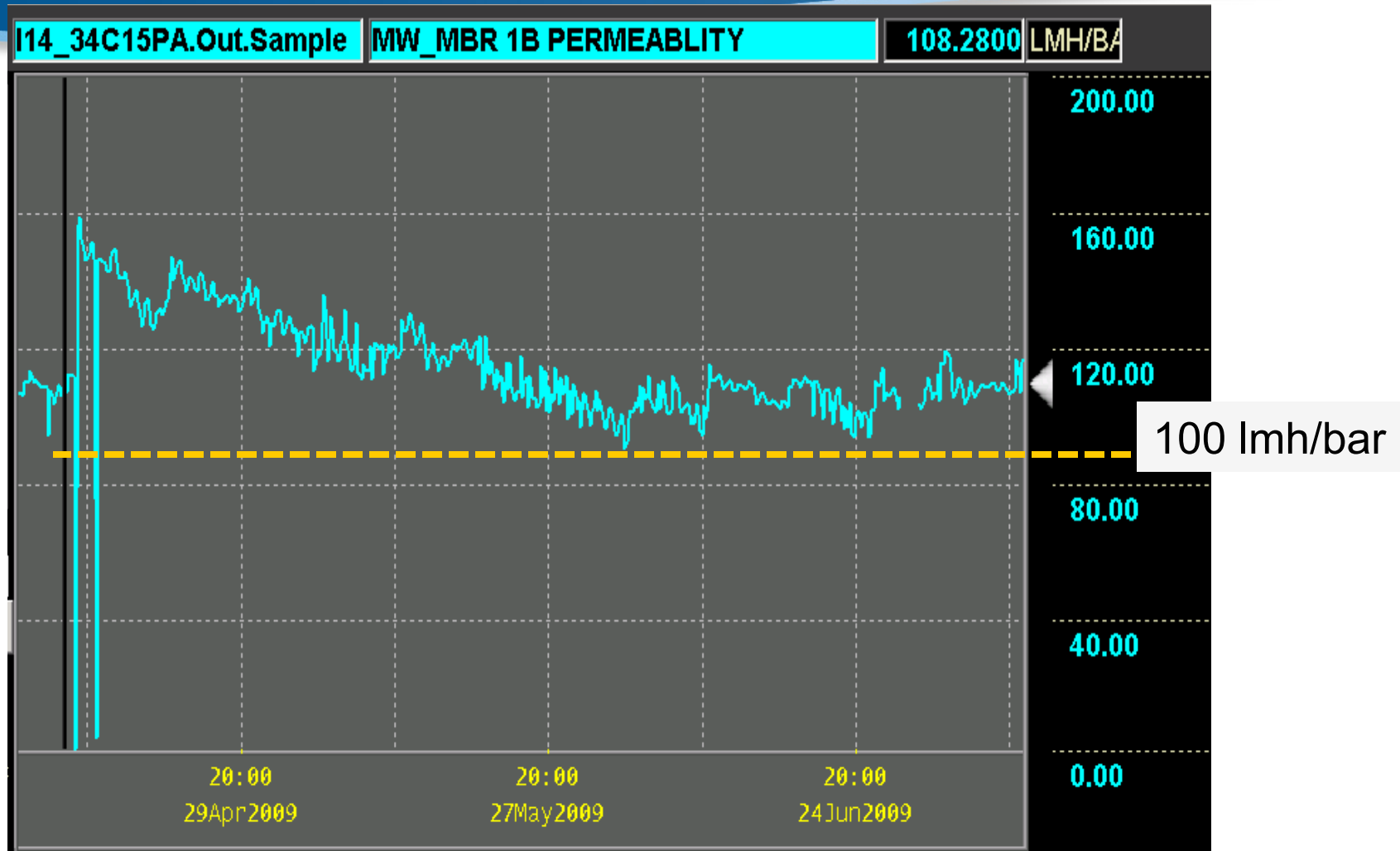
Fall of 2008 - Screened  
Mix Liquor to remove  
Accumulated debris.  
Capture Approximately  
100 cubic yards from  
A-Basins/MBR Tanks



# Fouled Membranes Regain Life After Screen Installation



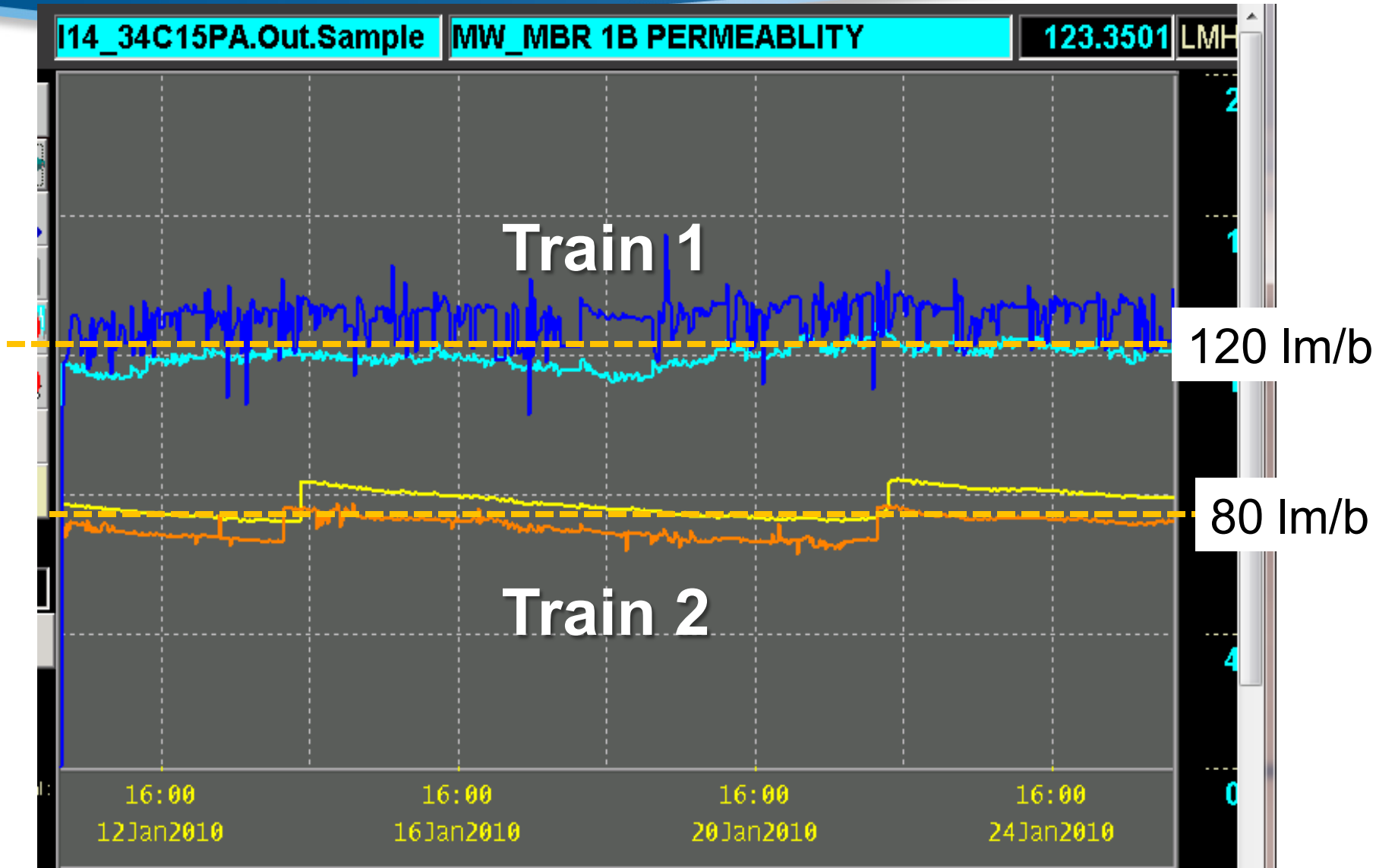
# Results of Membrane Performance After Screen Installation



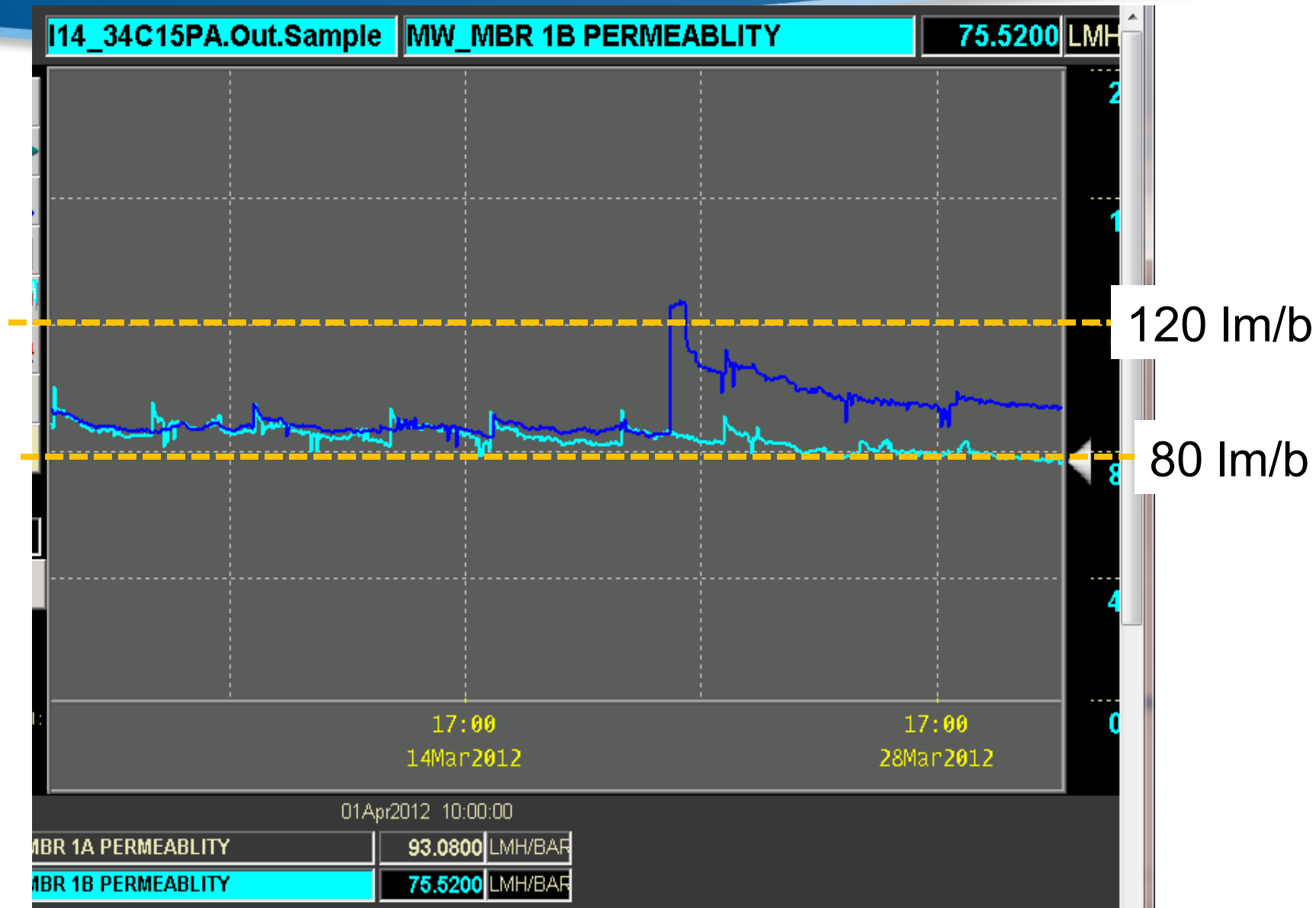
**Now CIP every 3 months**



# Performance After 2 Years With New Screen



# Performance After 4 Years With New Screen



# Comparison of Membrane Modules



Note the accumulation of debris top & bottom and the 'swelling' of the fiber areas

2 years of operation without the 2mm drum screen





# Comparison of Membrane Modules



4 years of operation train 1  
Post 2mm drum screen

Note the differences in  
debris accumulation





# Comparison of Membrane Modules Treatment Train 2



2008



2012



# Not All Screens are Suitable for MBR's



**Perforated Plates**



**Basket Screen**



# Questions ?

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