

# FISH SCREENING

## A BRIEF HISTORY, CRITERIA, & EXAMPLES

Washington Department of Fish & Wildlife

Presenter: Chuck Lenberg

# BRIEF HISTORY

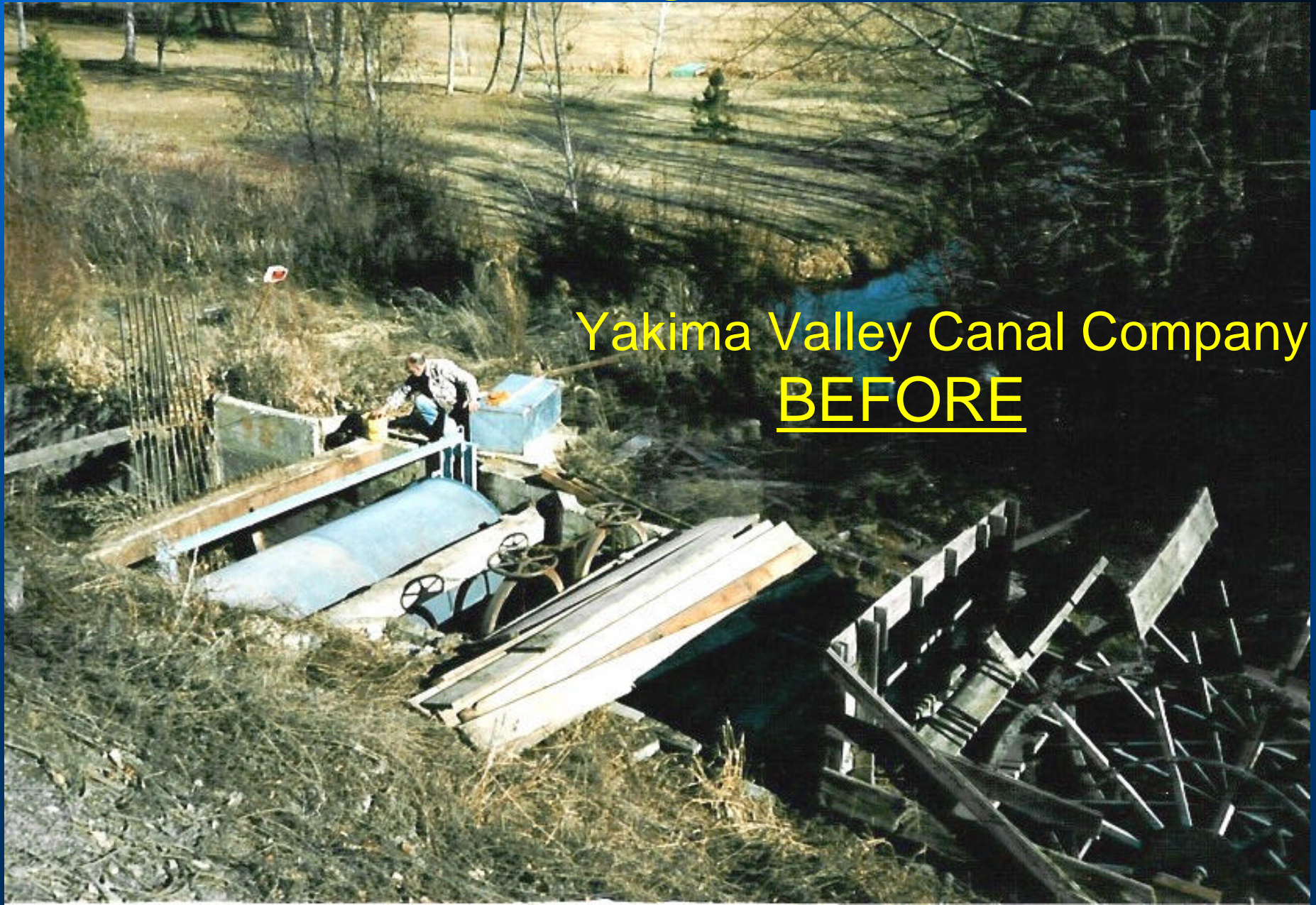
- 1905 - Washington State's first fish screening statute
- 1930 - Washington State's fish screening program established
- 1946 - Yakima Screen Shop established
- 2002 - Consolidation of construction shops / Yakima Construction Shop

# WDFW - Yakima Construction Shop





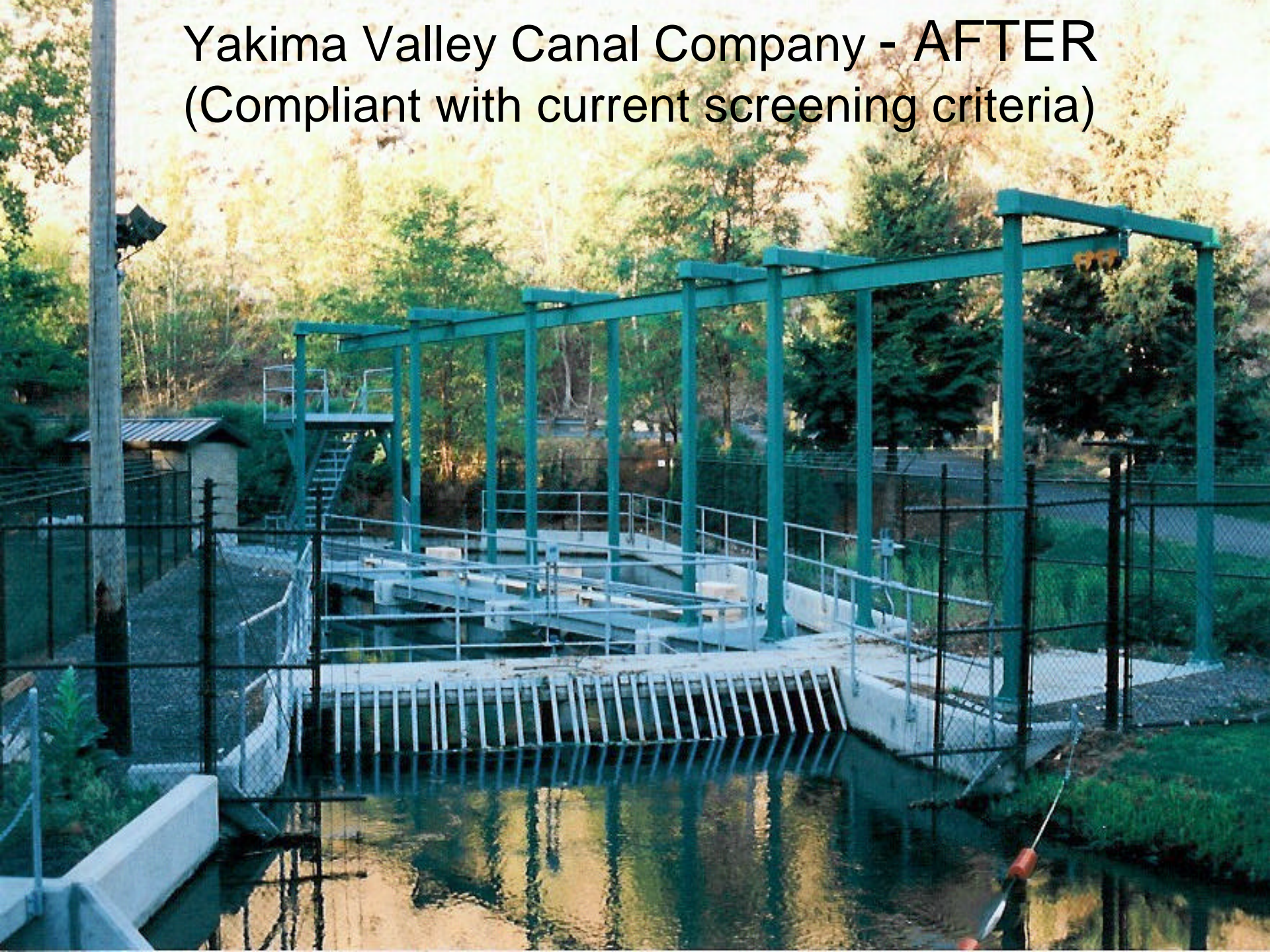
# First self-cleaning screen - 1928



Yakima Valley Canal Company  
BEFORE



# Yakima Valley Canal Company - AFTER (Compliant with current screening criteria)





Operational looking upstream



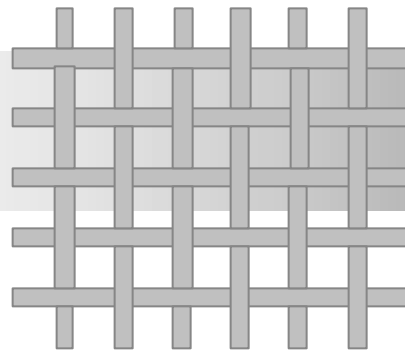


# REVISED SCREENING CRITERIA

- Screen Material Maximum Opening
  - Woven wire mesh - 0.087 inch (6-14 mesh)
  - Profile bar - 0.069 inch (1.75 mm)
  - Perforated plate - 3/32 inch diameter
  - Minimum open area - 27%

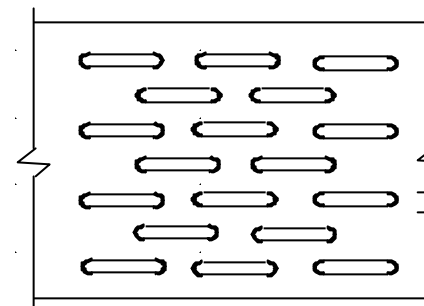
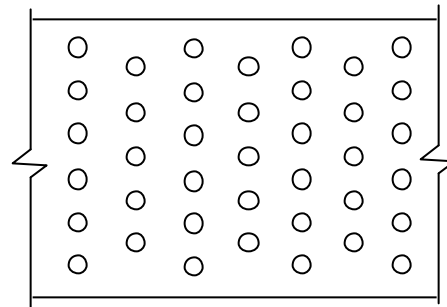
Woven mesh

Max opening  
0.087 inch

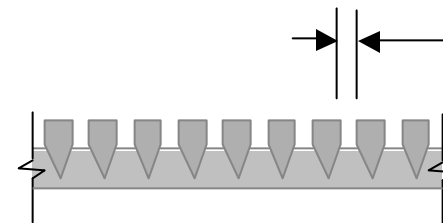
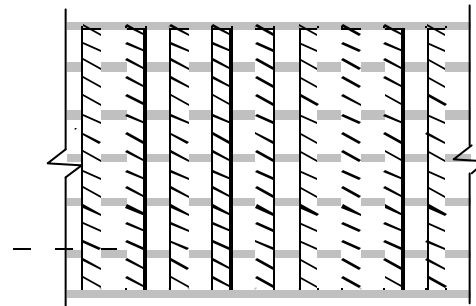


Perforated plate

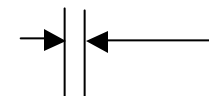
Max opening  
3/32 inch



Profile bar



Max opening  
1.75 mm



# Common Fish Screen Materials



# REVISED SCREENING CRITERIA

- Maximum approach velocity

Def. – perpendicular to and ~3 inches in front of screen

<0.4 feet per second

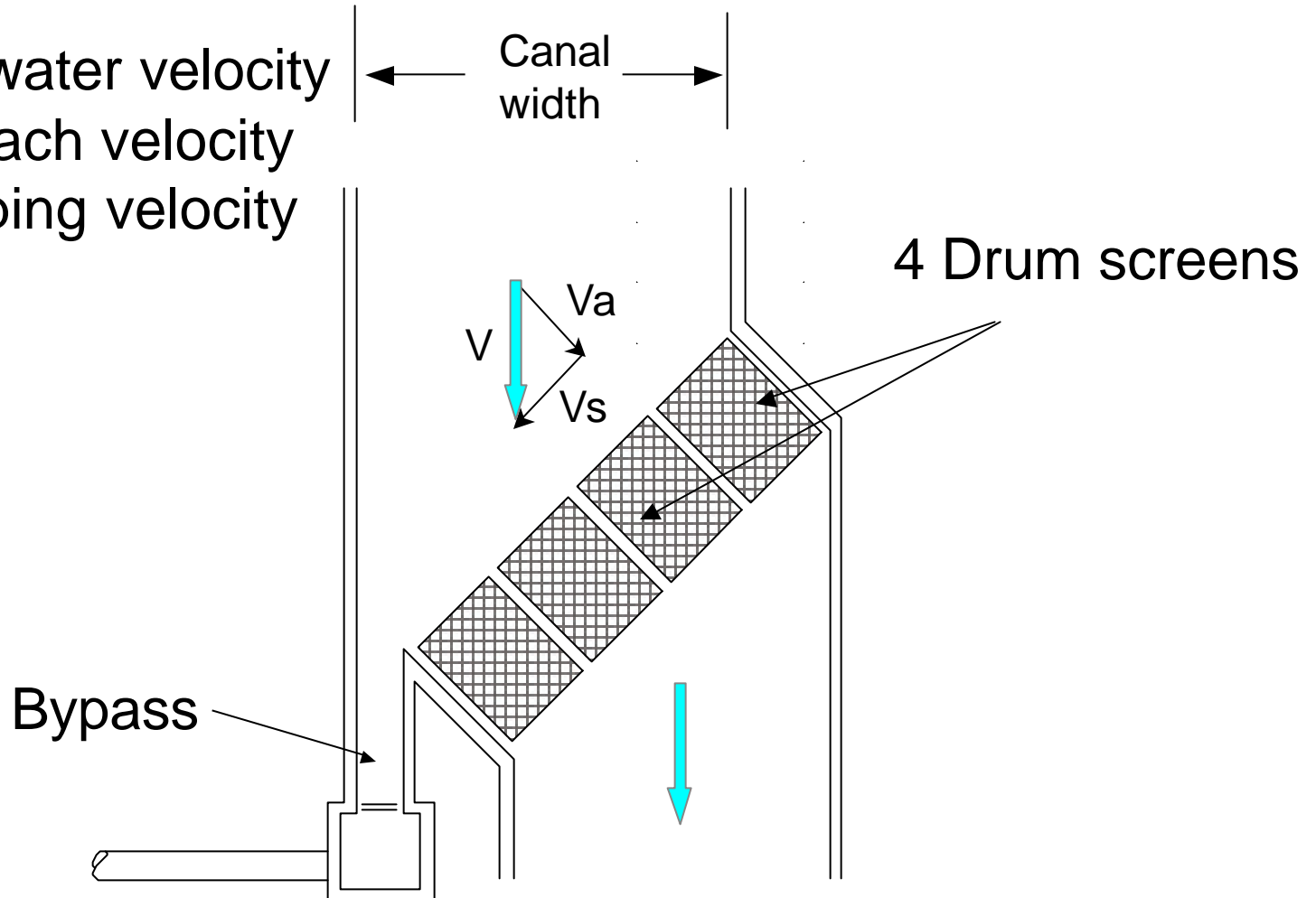
- Minimum sweeping flow

Def. – parallel and adjacent to screen face

> Approach velocity

# Approach Velocity

$V$  - Actual water velocity  
 $V_a$  - Approach velocity  
 $V_s$  - Sweeping velocity

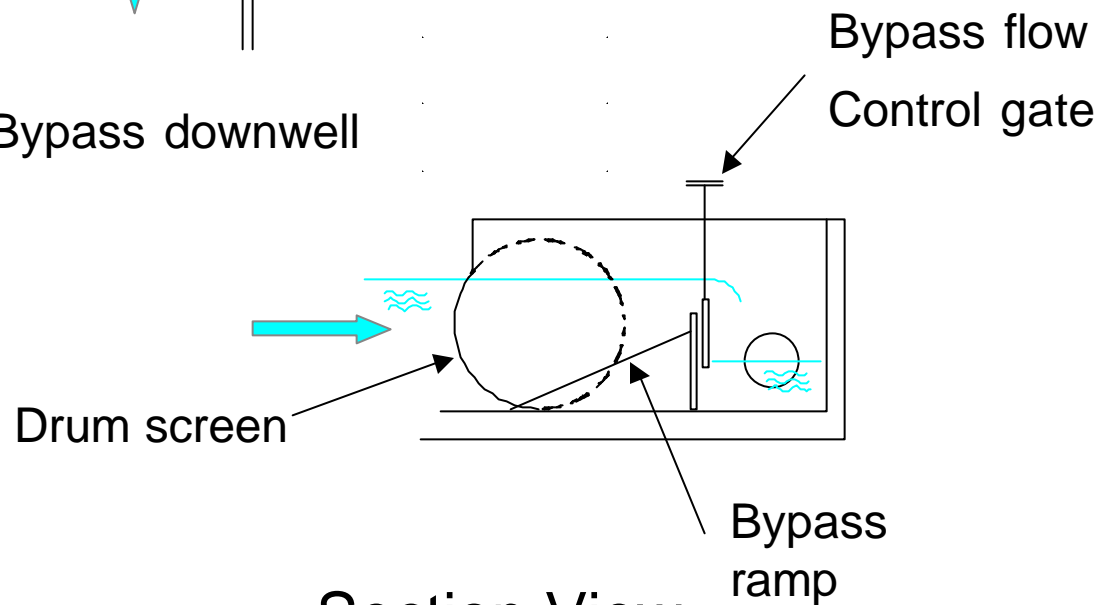
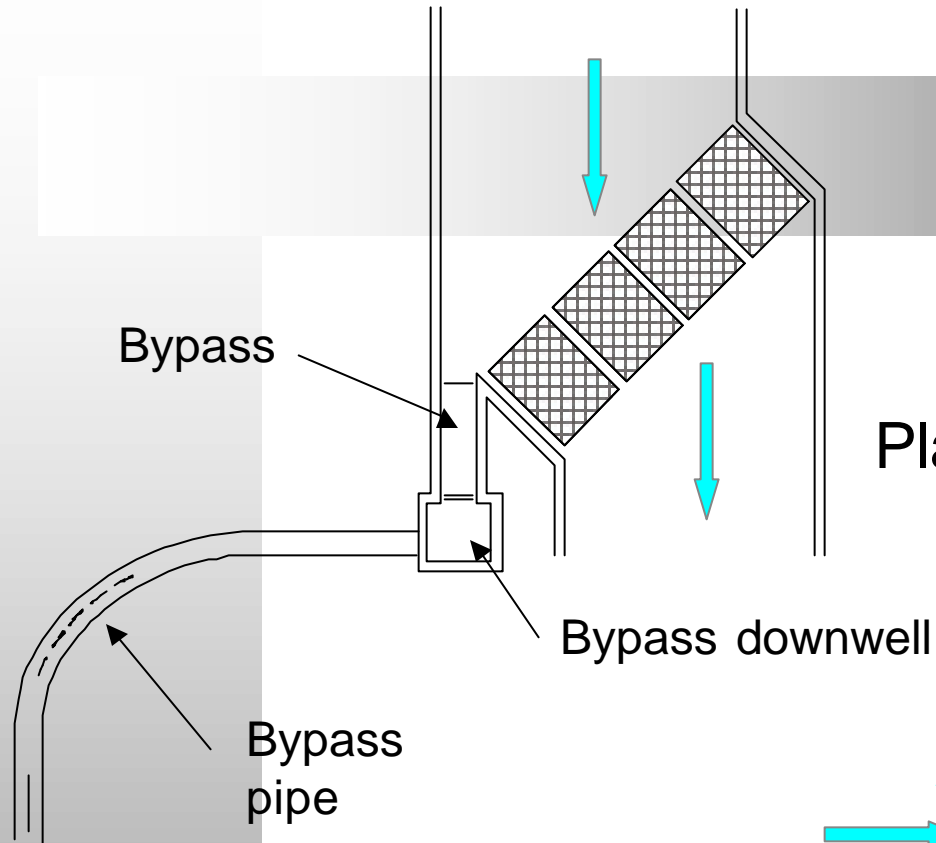




# REVISED SCREENING CRITERIA

- Bypass
  - Works in tandem with screen
  - Allows safe and expedient movement of salmonids to outfall
  - Adequate sizing to allow movement of debris

# Bypass





# Types of Fish Screens

- Traveling Belt
- Fixed Plate/Wiper
- Rotary Wiper
- Portable/Modular
- Rotary Drum
- End of Pipe - Pump Intake

# Traveling Belt Screens

- Ideal for point of diversion screening
- Preferred where water surface elevation fluctuates
- Small footprint



Sequim Area

Clallam-Cline  
Irrigation District



# Gleed Screens





# Gleed- Winter Storage





# Small Solar Powered



8.16.2002

# Fixed Plate/Wiper

- “Fish Tight” (no mechanical seals)
- Initial cost appealing
- Preferred where water surface elevation may fluctuate



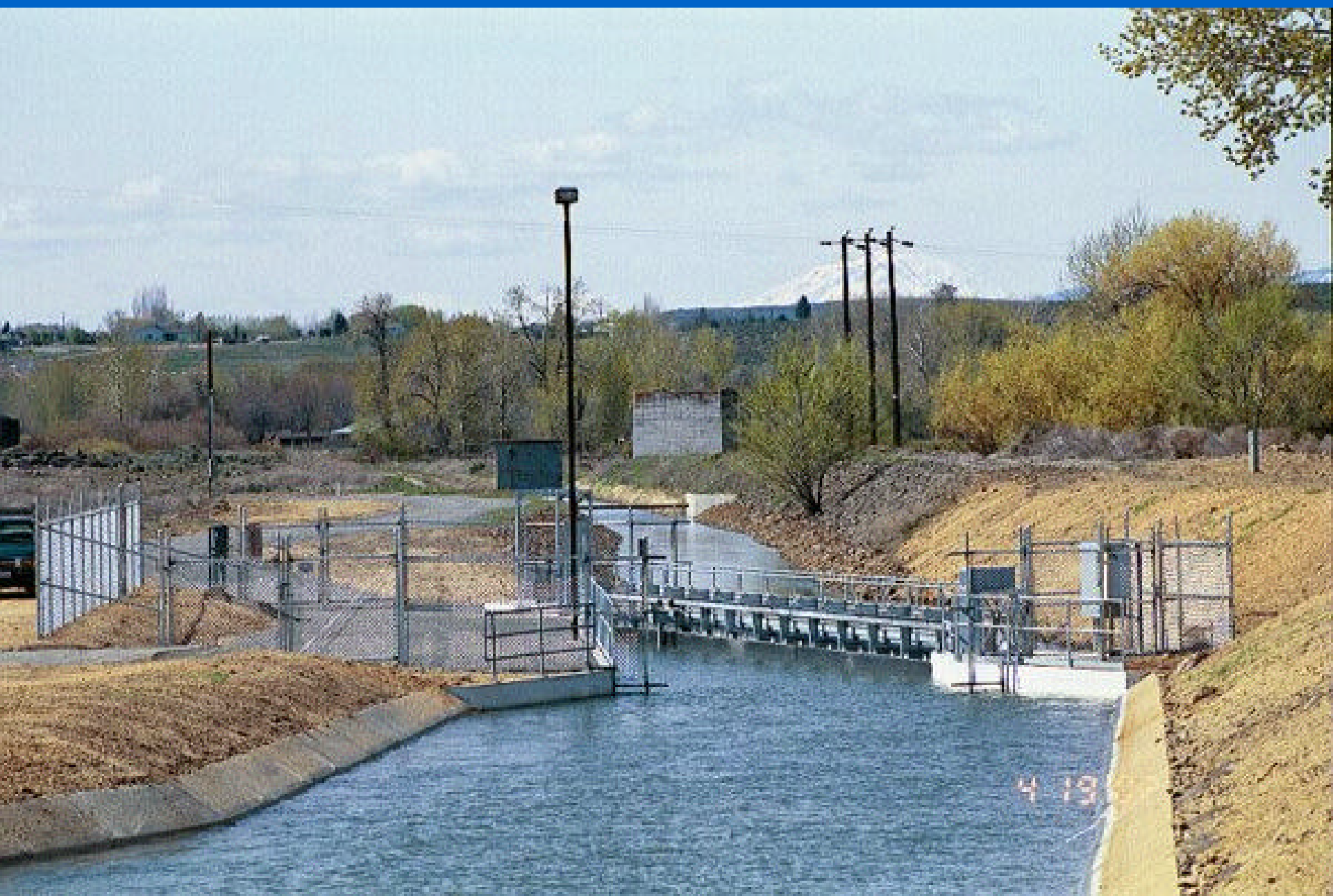
# Selah-Moxee



**Mono-Wiper Configuration**

3. 29. 2002









# Union Gap





# Gang Brush Wiper



Younger Screen Site

Yakima River near Cle Elum, WA

Gang Wiper/Paddle Wheel over Hydraulic driven ball-reverser



# Paddle Wheel / Hydraulic





# Rotary Wiper

- Small diversions < 2 cfs
- Remote areas - no electricity
- Cost effective

# Black Canyon

aluminum  
structure

chain  
drive













# Portable Modular

- 2 to 6 cfs
- Cost effective
- Ease of installation
- Ideal for remote locations

# Tice Ranch











# Beatty Ditch















# Rotary Drum

- Proven reliability
- Ease of maintenance
- User friendly - off the shelf parts
- Effective with limited water surface elevation variance

# Initial Placement of Screens





# Burlingame











Burlingame  
7ea. 4' Dia. x 14'



10 27 '99



# Wilson Creek



5.16.2001



# Powell- LaFortune





End of Pipe - Pump Intake

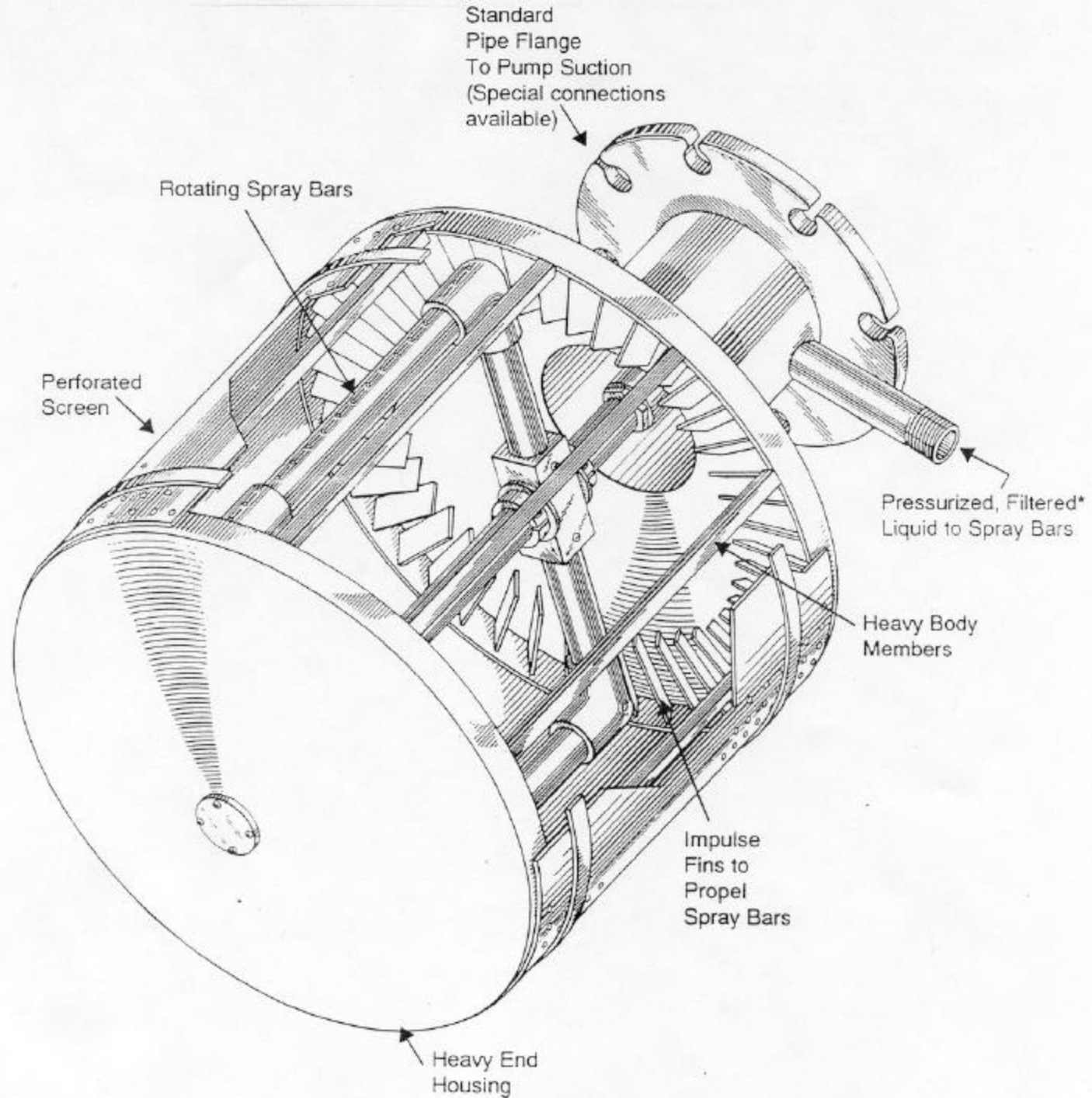


Custom Technology Co.  
Incorporated

# SELF CLEANING SUCTION SCREEN

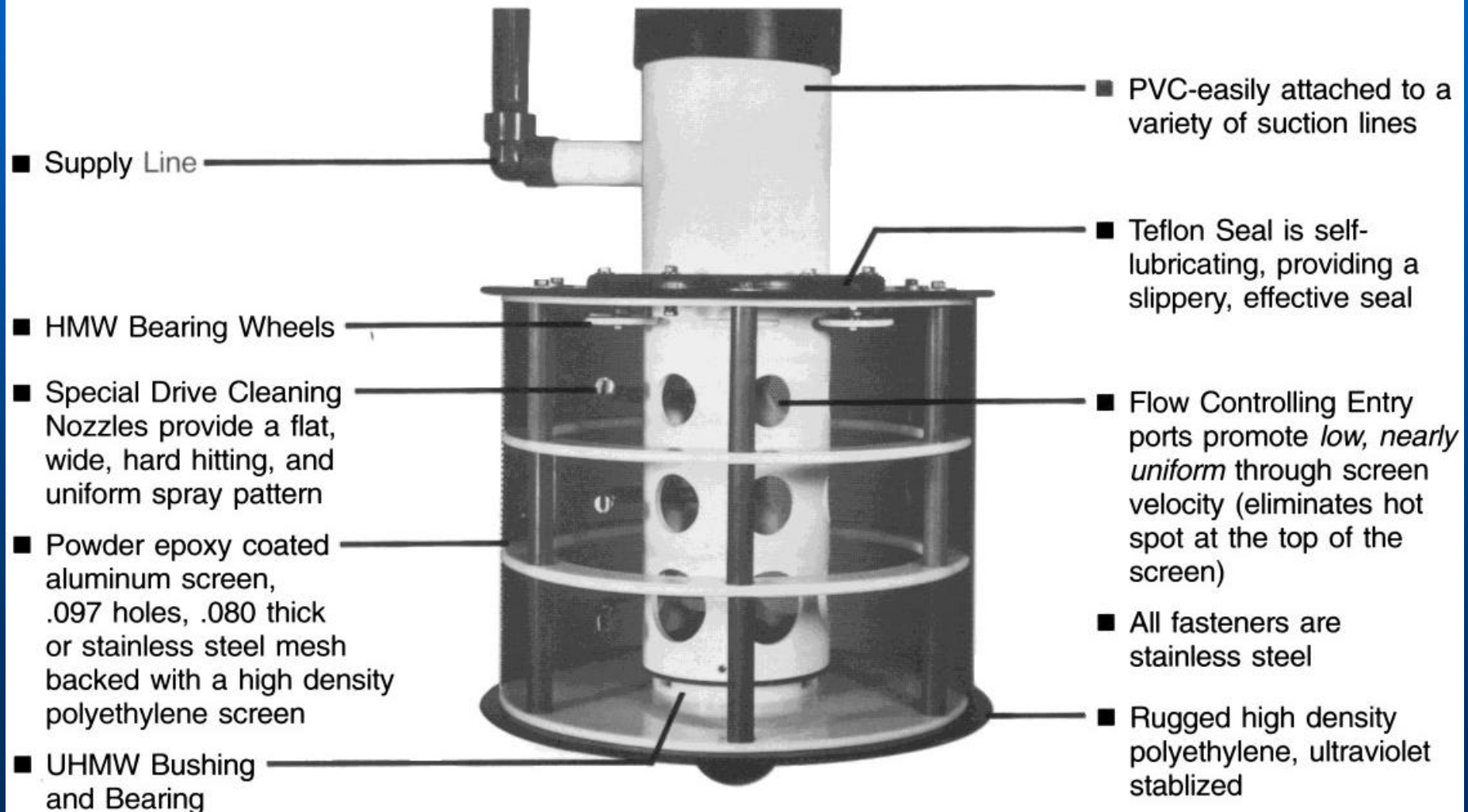






# SURE-FLO

## Self - Cleaning Strainers







# Hatchery Rebuilds

- **Update to Current Criteria**
- **Improve Drive Systems**
- **Incorporate Latest Technology**
  - **Coatings**
  - **Cathodic protection**



# Soos Creek



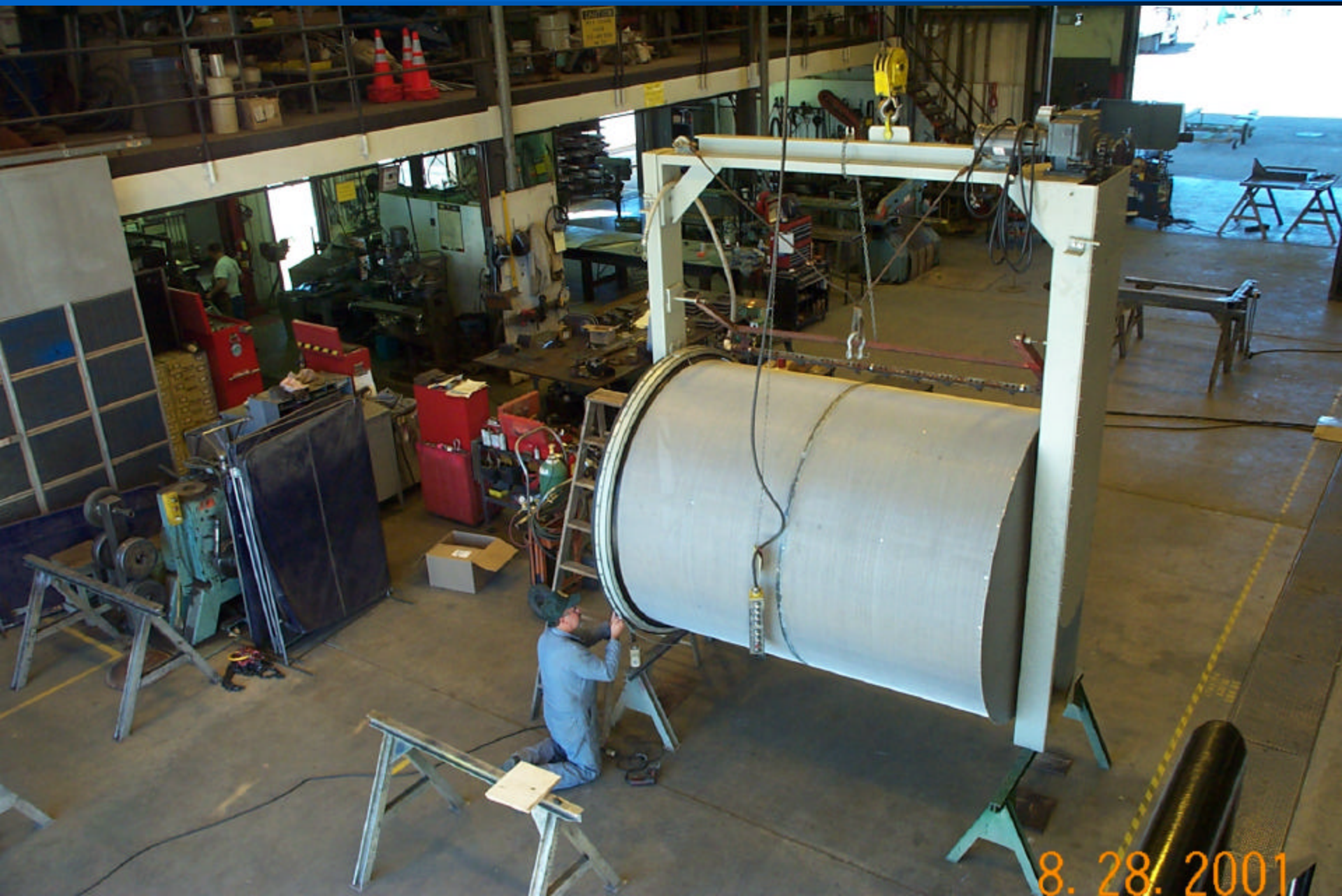
6.12.2001



## YAKIMA CONSTRUCTION SHOP







8.28.2001



# Kalama Falls Hatchery



7.16.2001





8. 7. 2001

# Screening & Passage Technical Assistance



# HABITAT PROGRAM

## TECHNICAL APPLICATIONS

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Screening Projects Program Manager  
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Pat Schille, Const. & Maint. Superintendent 2  
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# BUSINESS SERVICES

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