

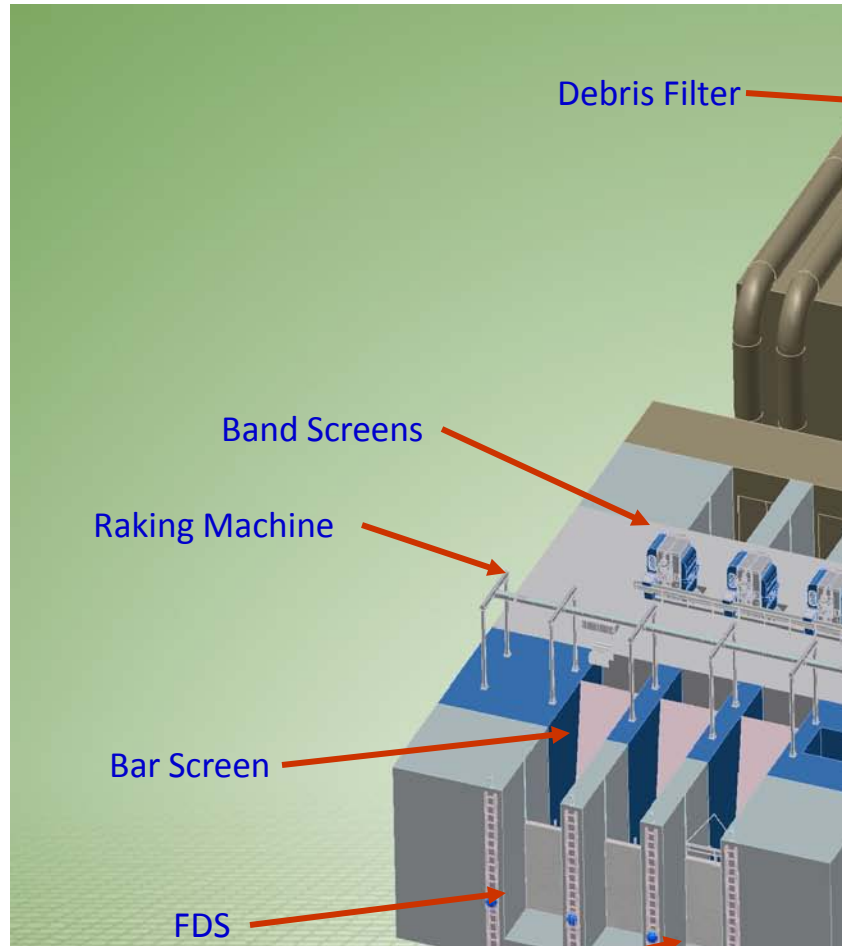


OVIVO
Bringing water to life

OVIVO USA

Mcilvaine WebEx Feb. 16, 2012 -Cooling Water Issues

Solutions for Circulating Cooling Water Systems



Debris Filter

Band Screens

Raking Machine

Bar Screen

FDS

Stop Gate

ATCS Ball Strainer

Stationary Screens



Through or Dual Band Screen

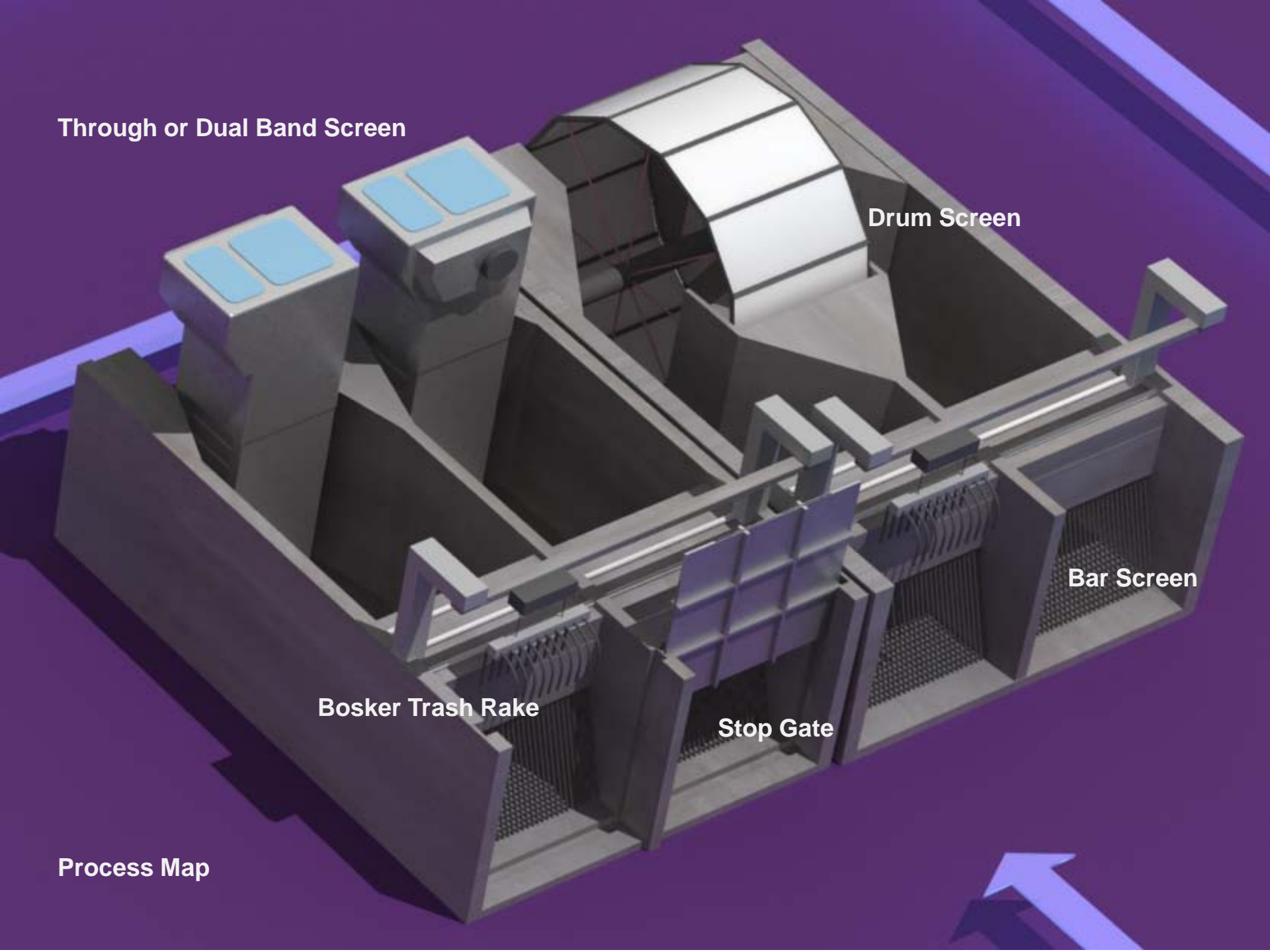
Drum Screen

Bar Screen

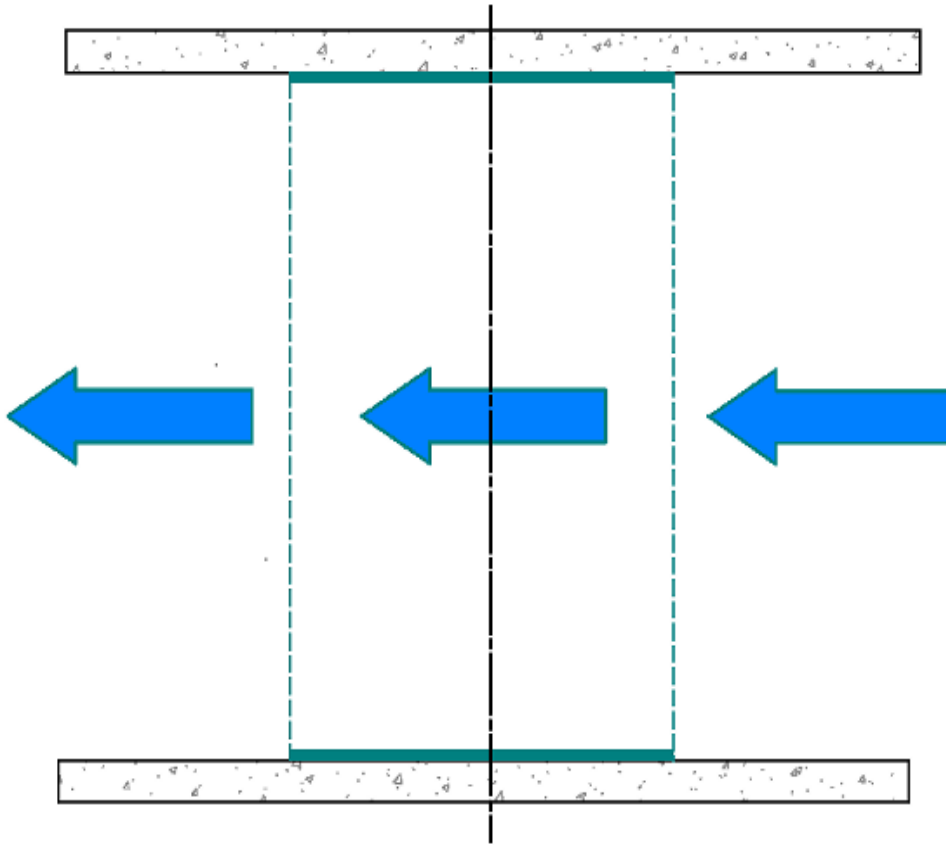
Bosker Trash Rake

Stop Gate

Process Map



Band Screen Through Flow Patterns



Through Flow (TF):

Produces a parallel flow

Simpler civil work requirement

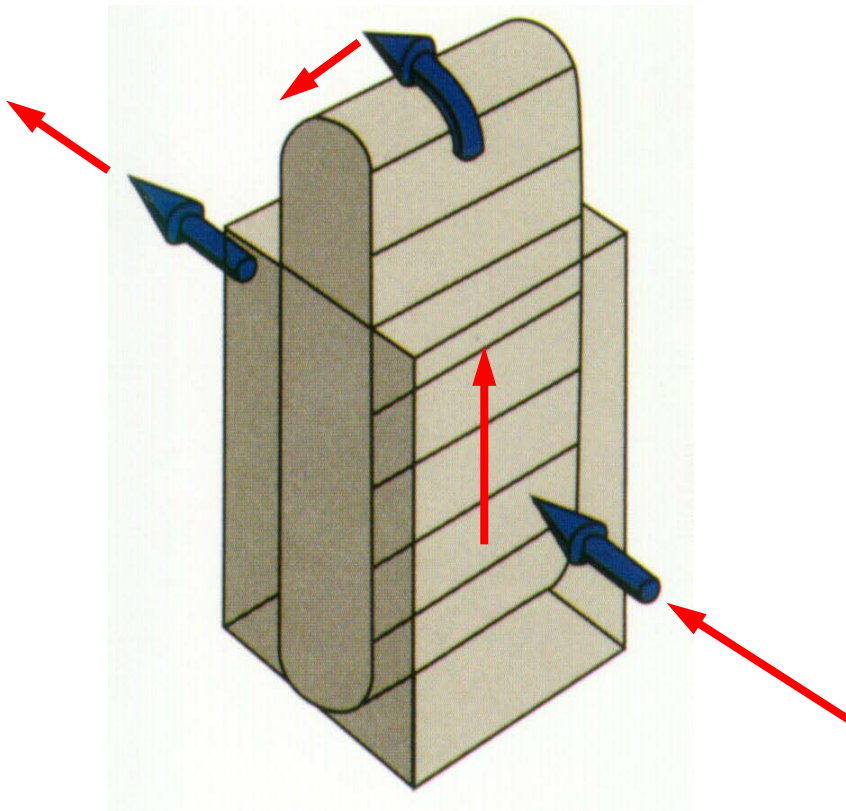
Flow has to pass through the mesh twice, can lead to higher headlosses with fine mesh.

Influent side in contact with effluent side

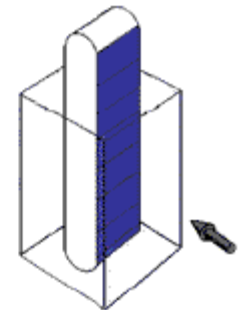
Debris carry over cannot be avoided

Straight Thru Flow Screen

Debris not removed is "Carried Over" to "Clean Side"



Influent Side is in contact with Effluent Side.
Debris Carry over cannot be avoided.



Thru-Flow Screen

Carry over with Thru Flow

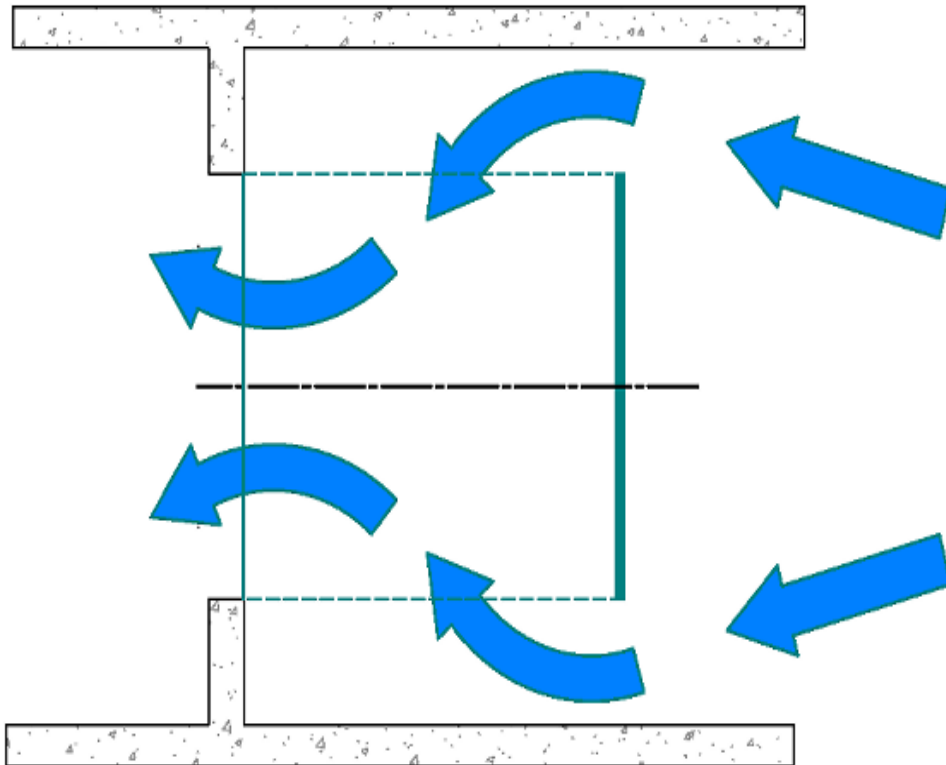


Carry over with Thru Flow

Debris in condenser from typical “thru flow screen”
due to debris carry-over



Band Screen DualFlow Patterns



Dual Flow (DF):

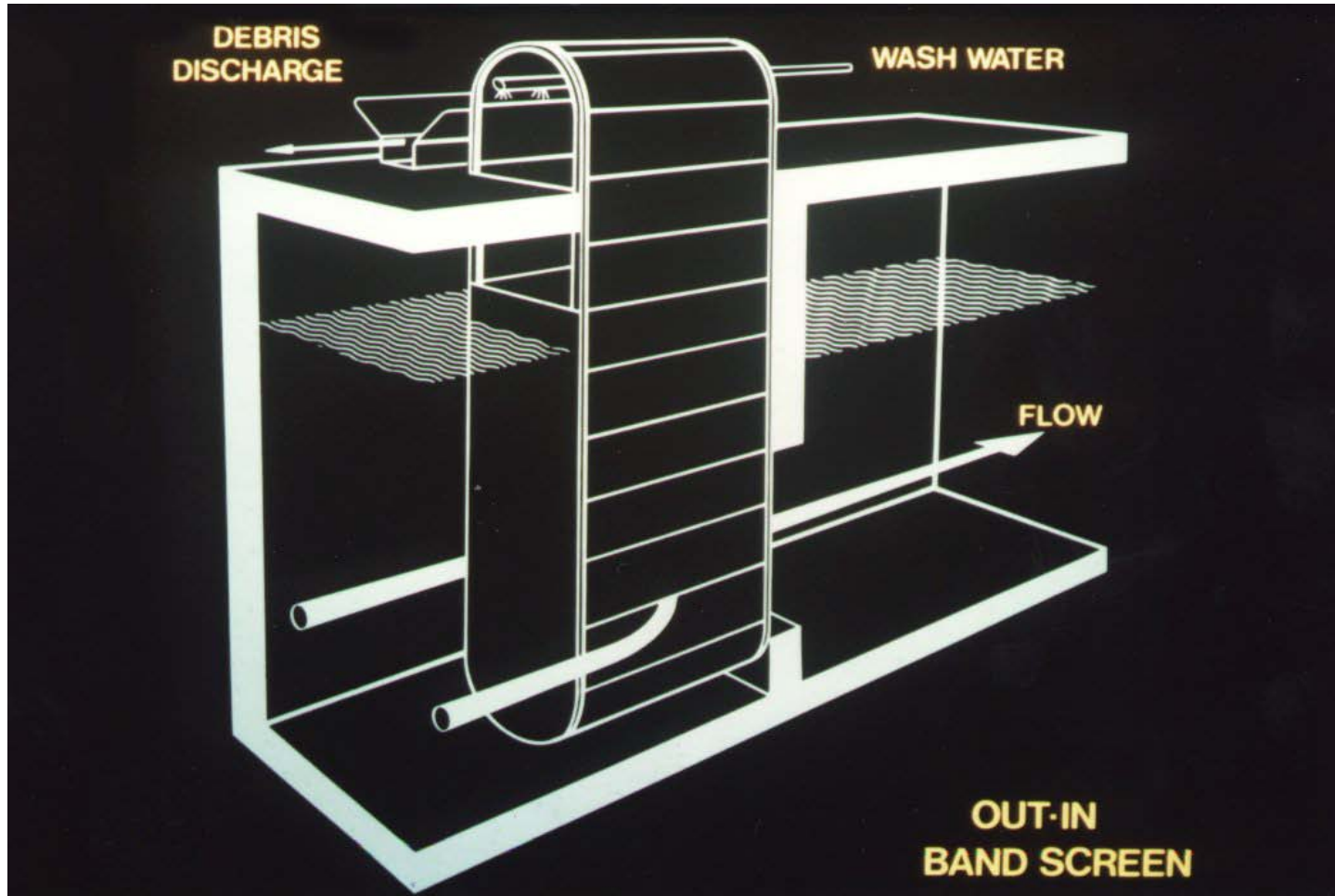
No “carry-over”

Produces a converging flow, therefore suitable for close coupling to CW pump

Debris Washes Outside

Out - To - In Dual Flow Screen

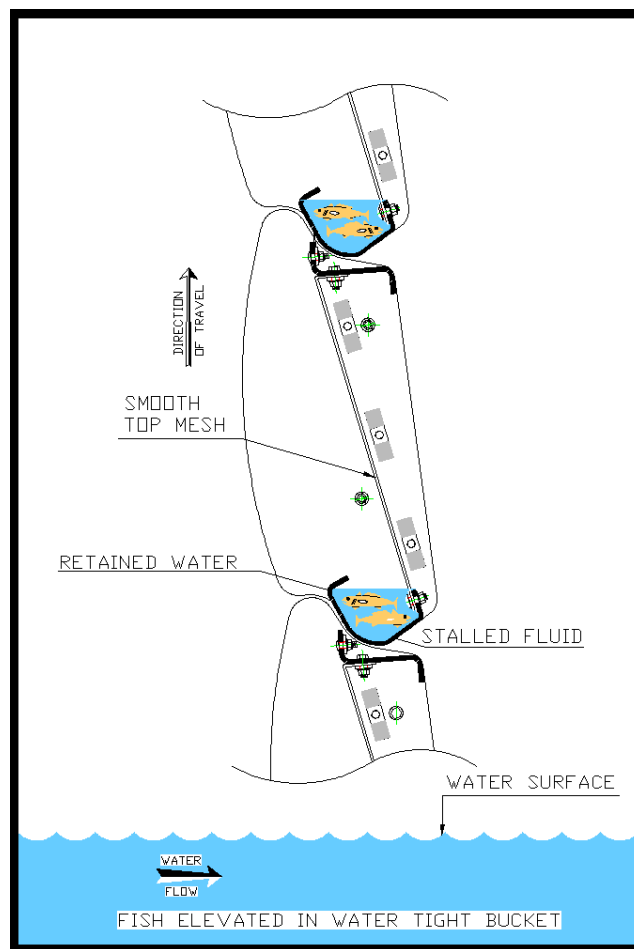
Primarily used for raw water intakes



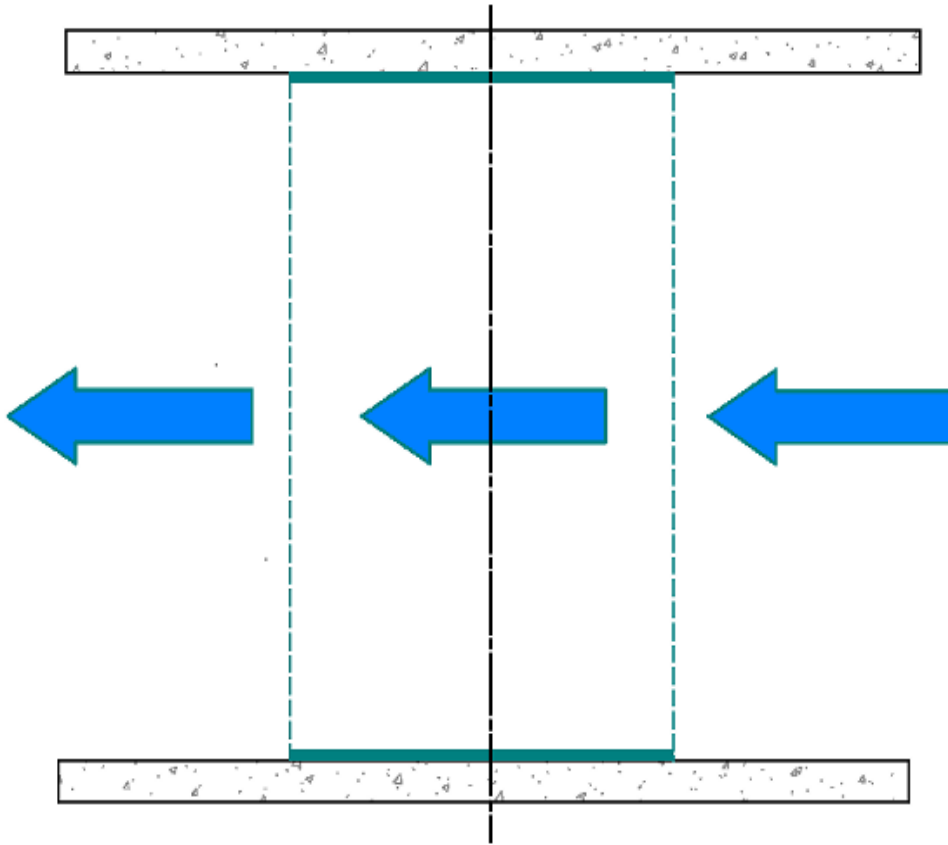
Influent Side is totally separated from Effluent Side.

How can this be applied to an existing intake ?

Fish Recovery - Bandscreens



Band Screen Flow Patterns



Through Flow (TF):

Can “carry-over”

Produces a parallel flow

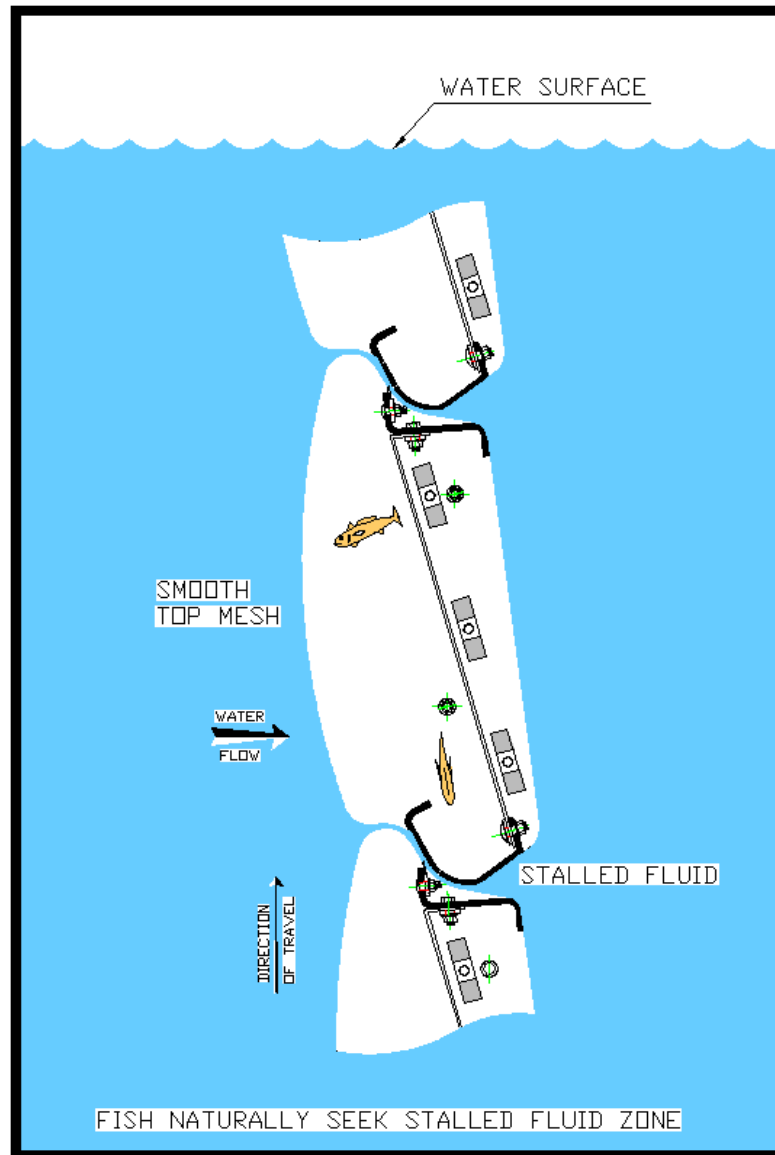
Simpler civil work requirement than for DF or CF types.

Flow has to pass through the mesh twice, can lead to higher headlosses with fine mesh.

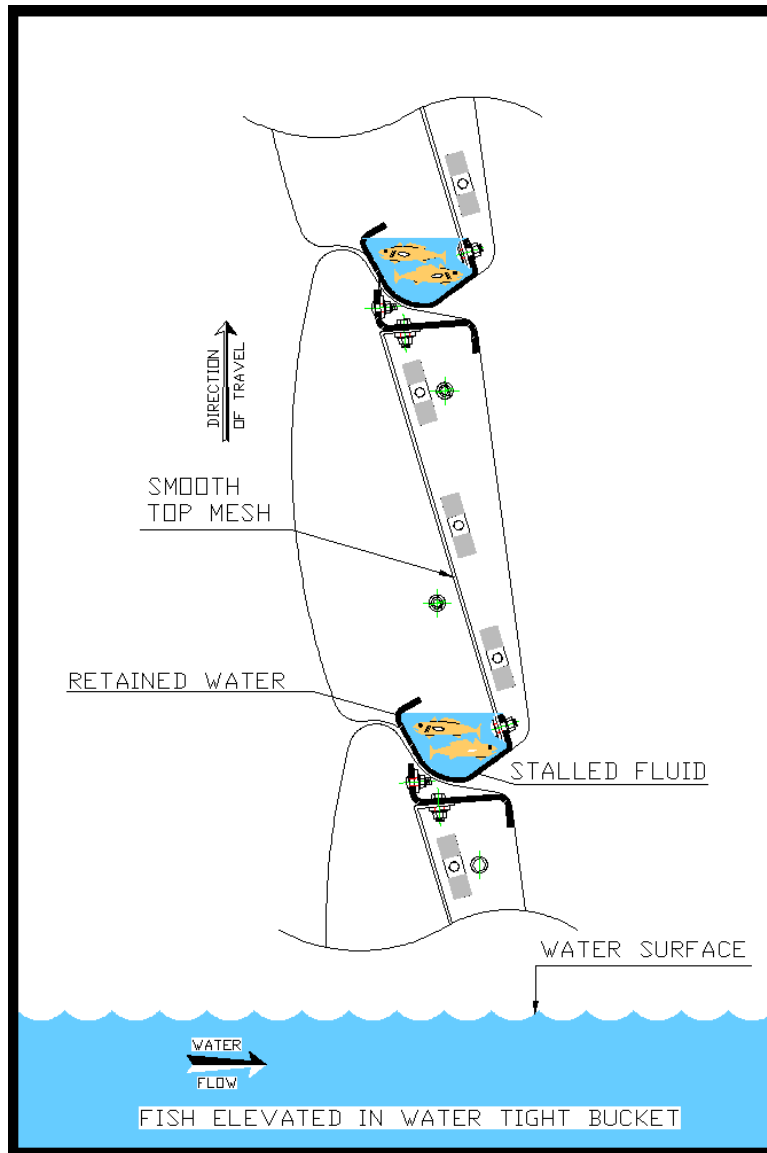
Predominately used in USA

S.I.M.P.L.E. Benefits and Performance

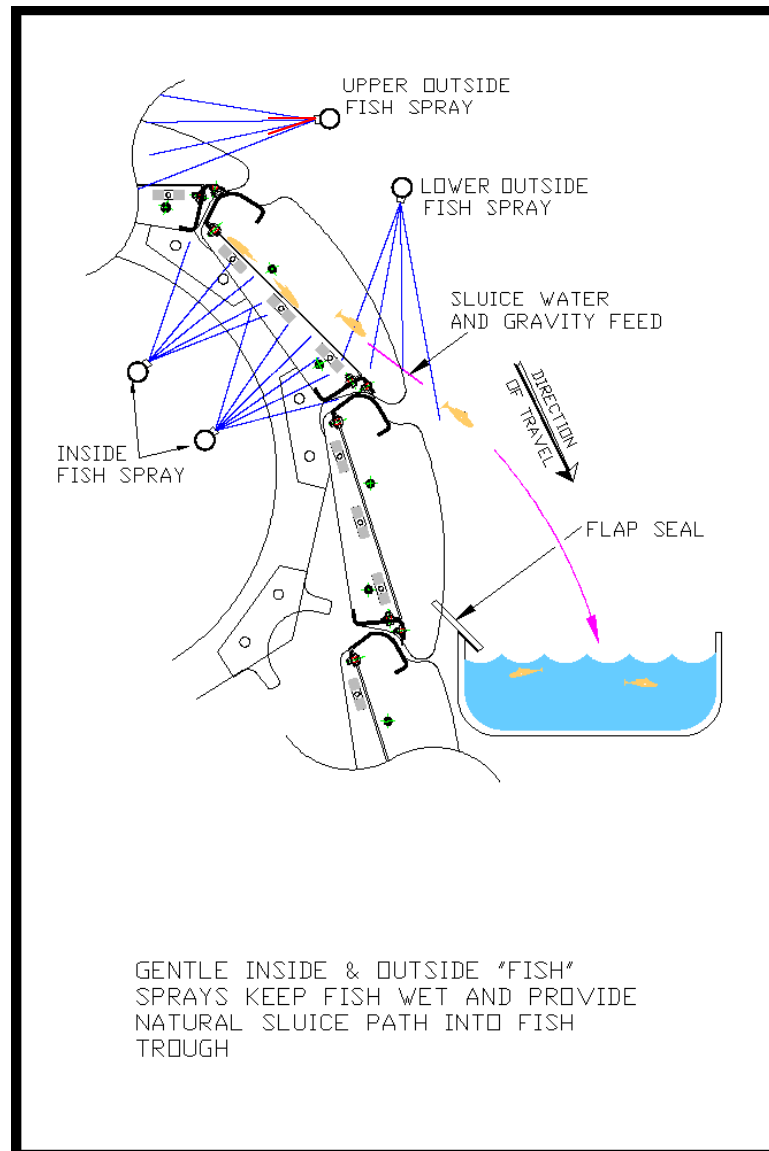
- Considered one of the BTA's for existing plants under rule 316 (b) now under review due to “cost” considerations (vs. cooling tower option) to increase survivability of juvenile marine life
- > 50 North American installations



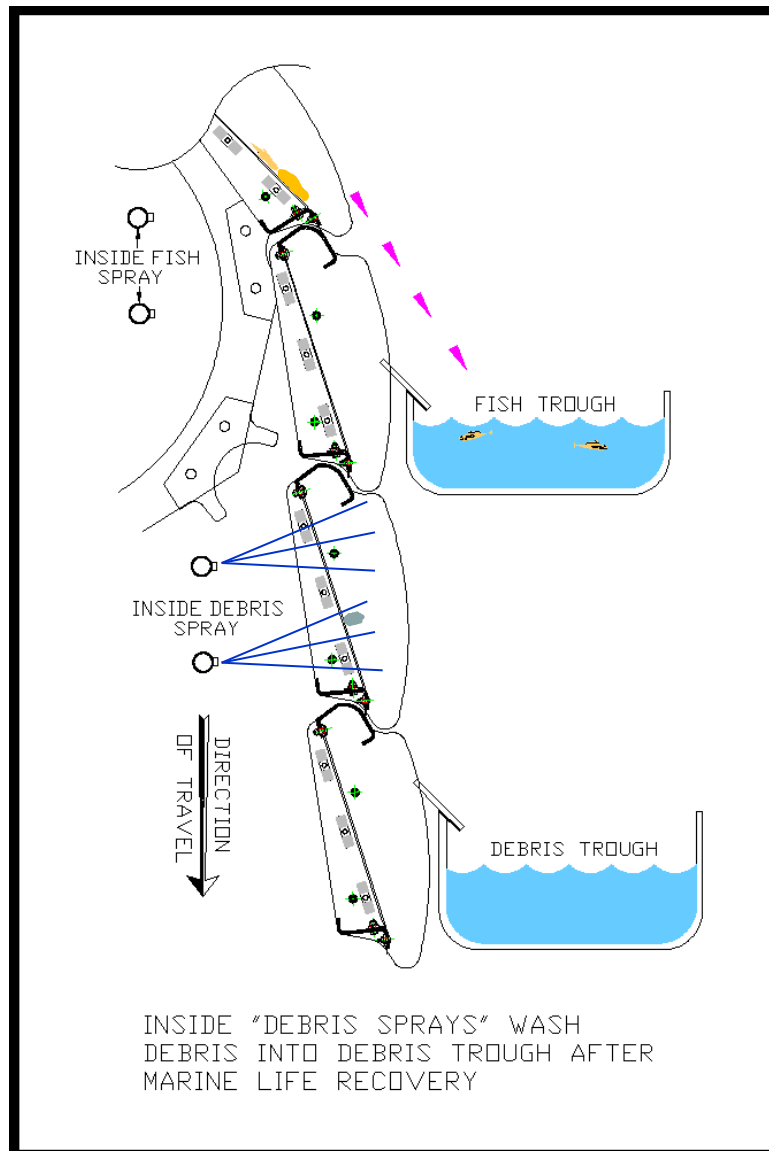
Juvenile fish drawn near screen seek the natural protection of the hydraulically stabilized bucket



Fish are elevated in a water tight bucket and transported to deck level.

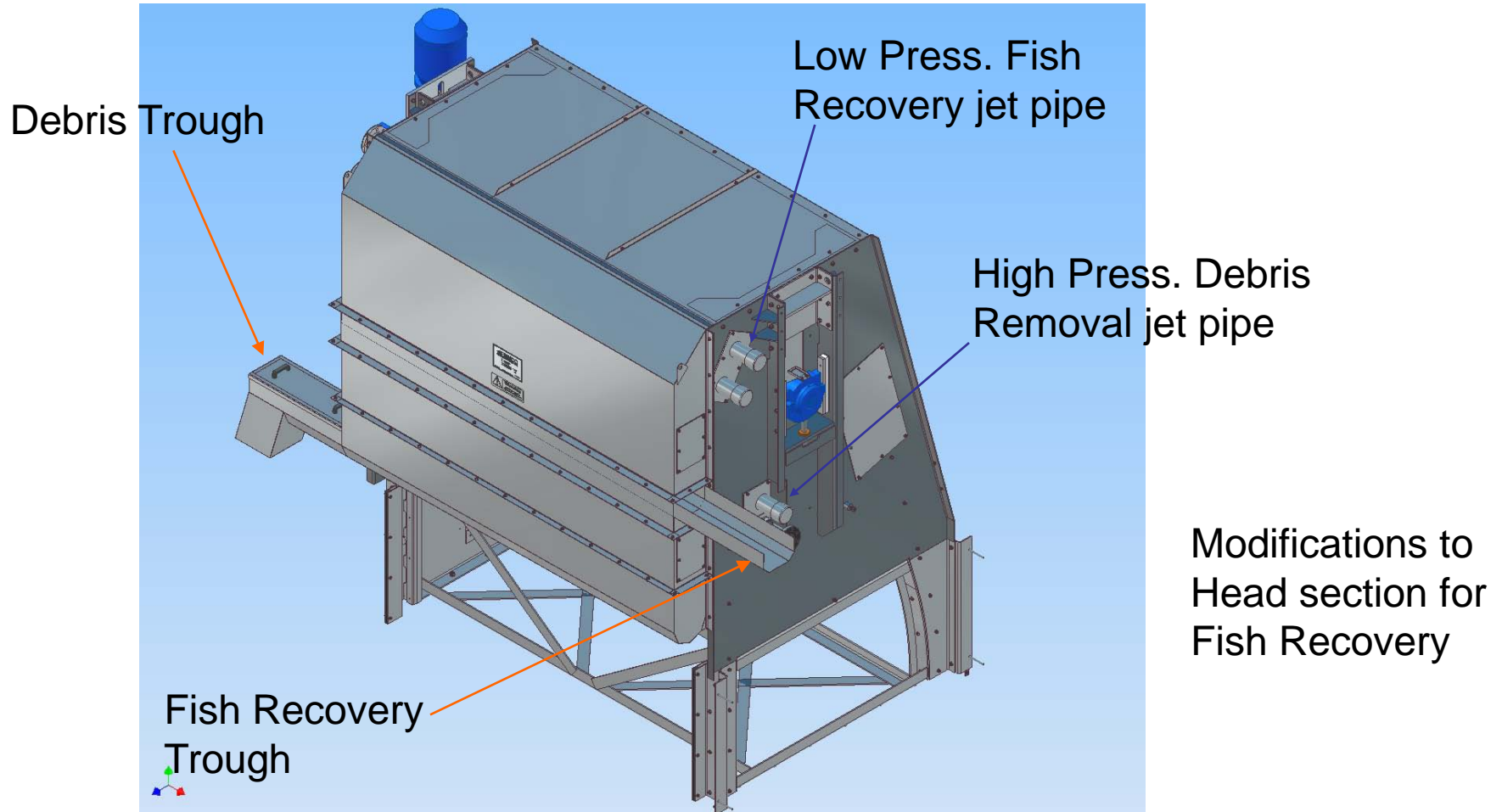


Juvenile fish are discharged by a gentle sluice into a fish transition trough which mates with final return trough



After fish are returned the screen continues past the debris spray and baskets return to water. Debris and fish are returned in separate troughs.

Fish Recovery - Bandscreens



Fish Recovery - Bandscreens



Modifications to
Head section for Fish
Recovery

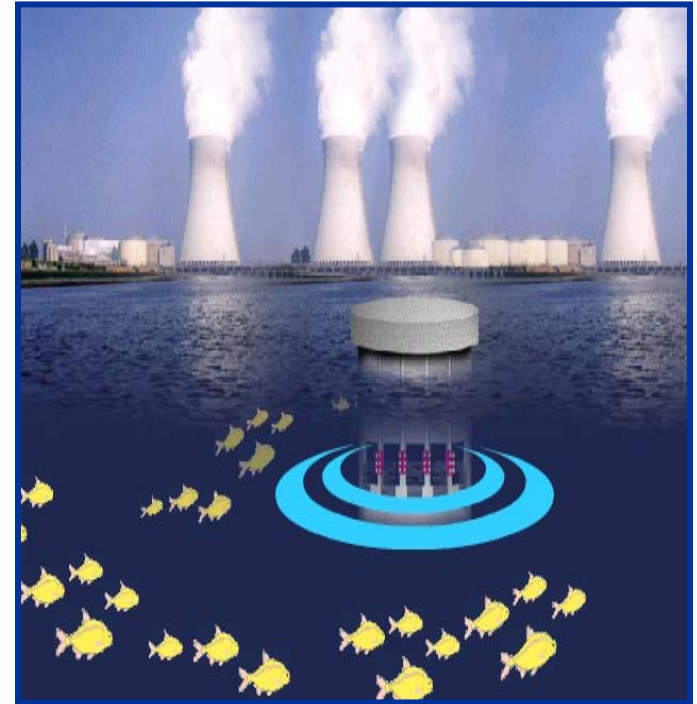
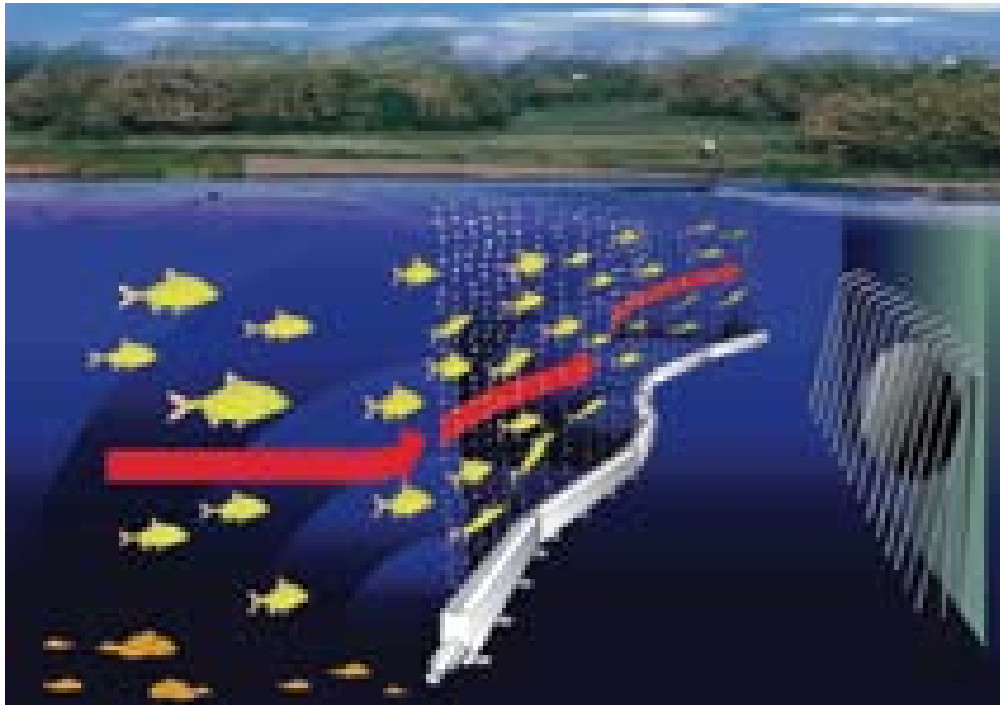
Low pressure
wash water jets
for sluicing fish

High pressure wash
water jets for debris
removal

Bridgeport Harbor Generating Station with Fish Recovery Band Screens



BAFF Fish Barrier/Deterrent Technology

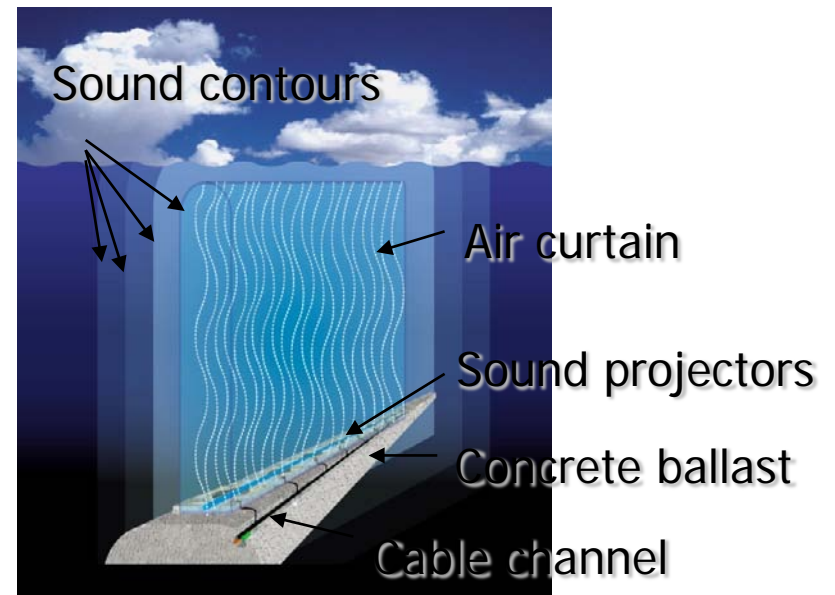


Behavioral Barrier & Guidance System to Prevent Fish Entrance Into Water Intake

The Sound Projector Array or 'SPA'

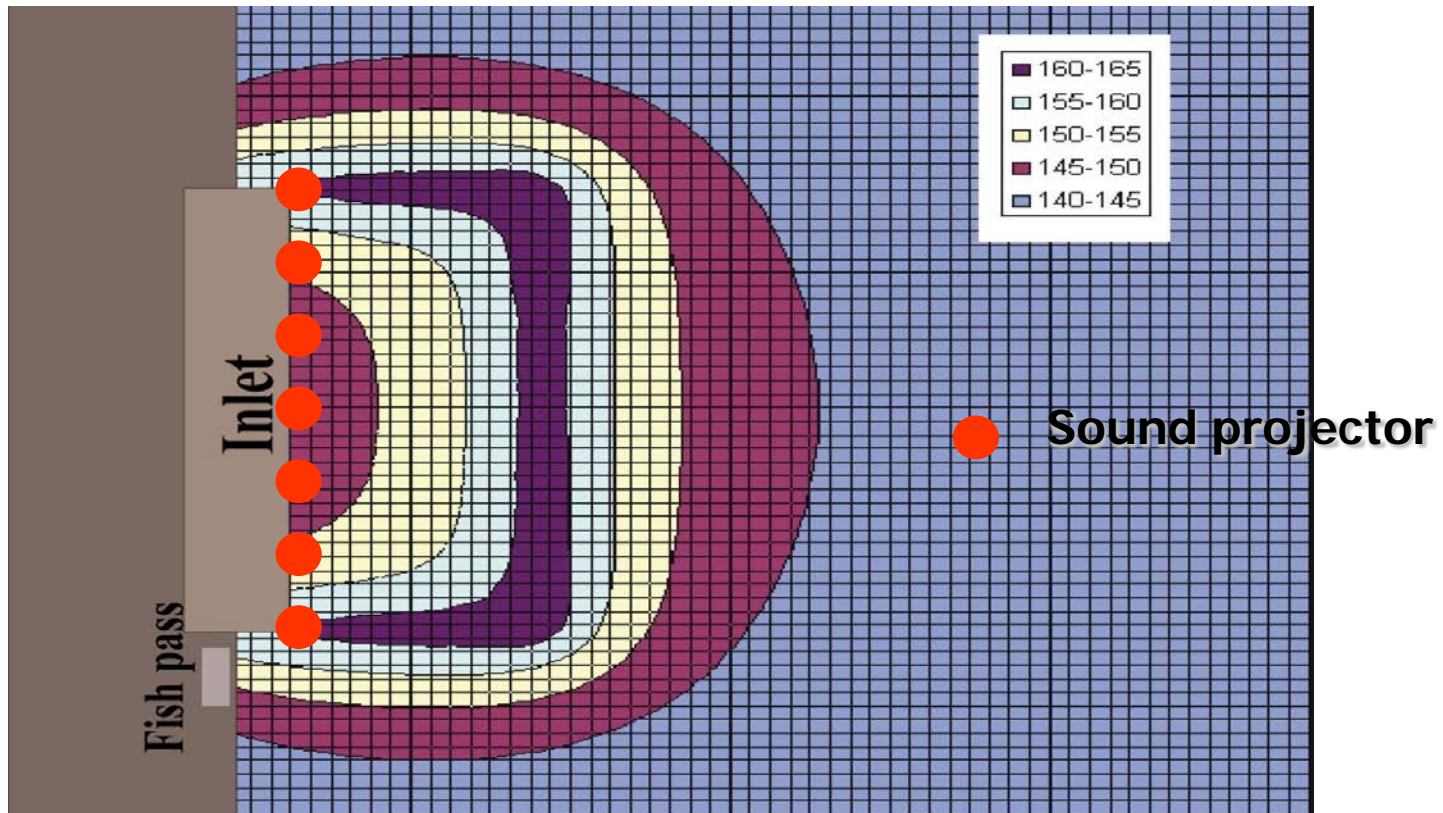


The BioAcoustic Fish Fence or 'BAFF'



Contour Plot of Acoustic Gradient in Front of Inlet (PrISM Model)

The aim is to achieve a smooth gradient of sound pressure



AFD installed at Power Plant Intake



AFD installed at Power Plant intake





Thank You