

**Fish Facility Design Review Work Group
5 December 2011**

Turbine Survival Program (Medina/Amman/Schwartz)

- Technical Editor is working on BIT document. Document should be available for regional review in March
- Document will have data gaps that equate to funding needs. The region will help prioritize filling the data gaps
- Ice Harbor Runner Design is moving forward.

JDA Configuration and Operation Plan (Medina/Hanson/Askelson/Tackley)

- Avian wire construction will be completed in mid to late January 2012
- Finalizing design for TSW permanence; expect completion in late January/early February. Will transition to Plans and Specs in January. Design emphasis: expedient TSW removal under emergency conditions
- Scheduled for contract award September/October 2012
- Stop-log replacement for John Day underway. Expect delivery early spring
- COP revision is under review at the division office

The Dalles North and East Adult Fish Ladder Study - (Medina/Lee/Tackley)

- HDR has completed 20% Engineering Design Report based on established minimum hydraulic needs (1400 cfs)
- Alternatives limited to HDR Brainstorming Report and the use of the fish-lock plumbing variations
- Anticipate completion of EDR next spring

B2 Corner Collector Gate Hoist

- Fabrication of gatewell underway. Contractor has mobilized and is on-site
- Construction and installation completion scheduled for 28 February 2012

B2 FGE (Medina/Lee/Schwartz)

- 60% report complete and under review
- Working through alternatives matrix; selection of alternative is pending availability of engineering cost estimates
- Final report completion scheduled for February/March 2012.

B2 FGE Proof-of-Concept (Medina/Petross):

- Design/modeling working in concert to refine design
- Design completion by the end of March
- Contract NTP early summer (June/Jul). Field-test in next September
- Fabrication cost: approx \$100,000 Total project cost: \$300,000 plus

B2 Orifice Improvement study (Medina/Kuhn/Schwartz)

- Alternatives have been identified and evaluated
- The top three ranked alternatives are:
 - o Reduce the orifice size but open additional orifices as needed
 - o Increase the capacity of the DSM while reducing the orifice size and opening up additional orifices as needed
 - o Re-core orifice tube to larger size
- Report, with all the required reviews will be completed in May 2012

Dec 5

Update for Natalie Richards- 12/5/2011

Lamprey Program- 118738

Meet with MOA Treaty Tribes-10-year Lamprey Plan	Sept 28, 2008
Discussed Research needs Lamprey and Salmon	Feb and March 2009
USACE Lamprey team meeting- PMP, 10-year Plan, 2010 estimated funds and FY09	March 19
Starting BONN Washington Shore- Kickoff Entrance Modification work	April 21
Meet with MOA Treaty Tribes- 10 year Plan comments addressed and Prioritization	April 22
1-year Accord Celebration	May 8
Lamprey Passage Efficiency- Cascade Island Ladder	June -July
USACE Lamprey team meeting	Aug 17
USACE meet with CRITFC/ Tribes	Aug 18
USACE Lamprey team meeting- NWW	Oct 28
USACE meet with CRITFC/Tribes- 3 meetings-NWP, NWP, NWW	Oct 1 (COL), Oct 21 (COL), Oct 29 (Team)
NWP Meeting with CRITFC Tribes	2/11/2010 at McNary Dam
NWP Lamprey Ranking Meeting-NWW	3/24/2010
Bi- Monthly Meeting- NWW	9/2/2010
Bi- Monthly Meeting- NWW	10/29/2010
Bi- Monthly Meeting	1/14/2011
Bi- Monthly Meeting	3/11/2011
Bi- Monthly Meeting-Portland	5/20/2011
Next- Bi- Monthly Meeting-NWW	7/7-8/2011
Juvenile Lamprey Workshop -Room 3A	8/18-19/2011
Bi-Monthly FY12- please mark Fishery calendar	1/12-13, 3/1-2, 5/31- 6/1, 9/6-7, 2012

Issues-

- Upper level Meeting with Gen McMahon and CRITFC in Dec 14 at CRITFC
- BONN WA Shores-Gravity Flow-Completed 60% Plans and Specifications-Going through Comments

Adult Salmon and Steelhead Studies-118618- awaiting estimates for Kelt work

John Day North Fish Ladder – 138171

Issues- Fish Exit- ARRA-Completed training, finalizing the project

Entrance

- ARRA 13.8 KV Power - processing As-Builts
- Slayden- Mobilizing and planning to start in ladder early Dec
- 6 Pumps, Power Controls and Housing-Model Testing/Design and Construction
 - Electrical Building. Building is in place
 - Out of Service Pump 4 opened up- sand blast paint Contract Mod being negotiated
 - Out of Service Pump 3 next- fabricating head cover

JDA&TDA PIT alternatives Study- 353193 & 74- 30% Report out for review through Dec 9

Bradford Emergency Repair- Completed Oct 31- awaiting hydrosurvey results

TDA and JDA PIT Implementation Update-

Current Rough Schedule

30% Alternatives Report completed. Anticipate 100% by June 2012

Design Documentation Review (DDR) – 9 months- April 2013

Plan & Specifications- 1 year- April 2014

IWW period for 2014?? (NMFS request 2013 implementation)

BiOP- requires both dams → NMFS changing to TDA?

JDA at Exit

Cons-

- a) Need 3 weirs for redundancy
- b) Weir removal required floor removal on elevated ladder will be difficult and expensive (~\$5-6 million)
 - a. 8-12" of floor removal → need to completely redo whole section of the ladder
 - b. Using Feratiles+ PIT reader provides possible passage issue for lamprey
- c) Team recommends going into the count station which has a lot of steel (~\$3 million)

Pros-

- a) Current Fish Entrance construction will have 2 PIT readers installed by end of 2013.

Can only adding one at the Fish exit be sufficient?

no if single antenna
maybe if multiple antennas

Not good for reading Salmon

TDA East (TDA North)

Cons-

- a) Need 3 weirs for redundancy
- b) Weir removal required floor removal on elevated ladder but floor is much thicker. Will be difficult and expensive (~\$5 million)
- c) Vibration concerns with replacement of 3 oscillating weirs to non-steel affecting cross sections and impact floor.
- d) (TDA North)- Pacific States testing Feasibility of ½ duplex with full duplex-Convert 3 existing ½ duplex ???)

Pros-

- a) Thick floor provide better situation for implementation than at JDA.

Is there any flexibility on the redundancy?

from Hanson

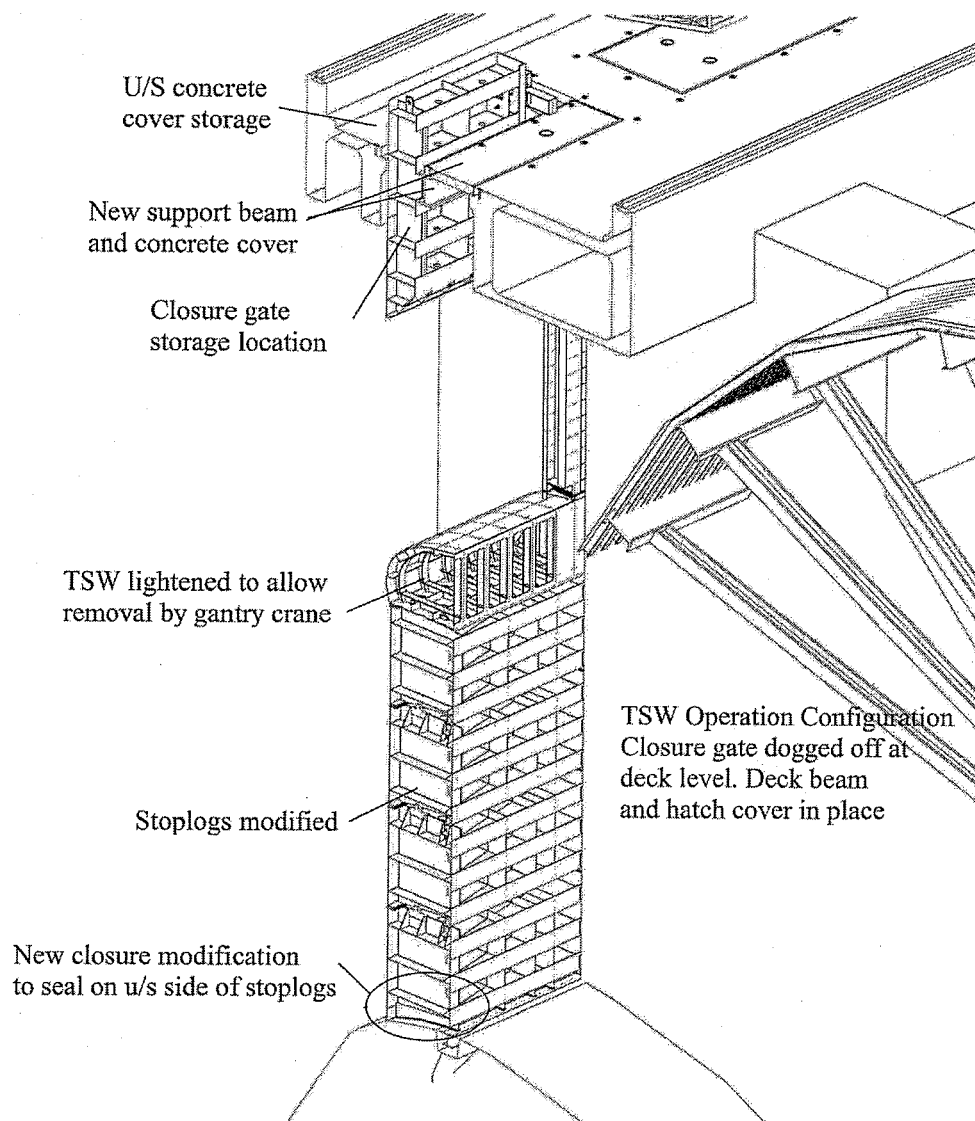
DECEMBER 5, 2011

THE JOHN DAY DAM, PERMANENT TOP SPILLWAY WEIR (TSW) UPDATE

Status: Currently in Design of a permanent System

Design tasks: TSW lightening, Inspection modifications for TSW, permanent stoplog modification, deck modification.

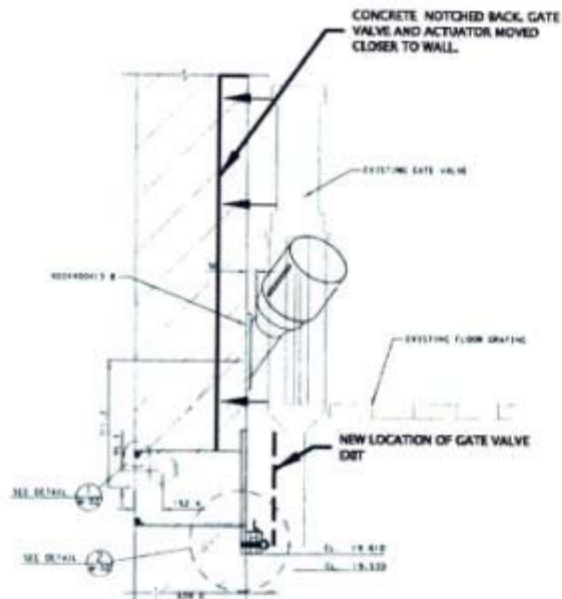
Schedule: Advertisement of permanent installation FY 12, Permanent installation to be complete by April 2013.



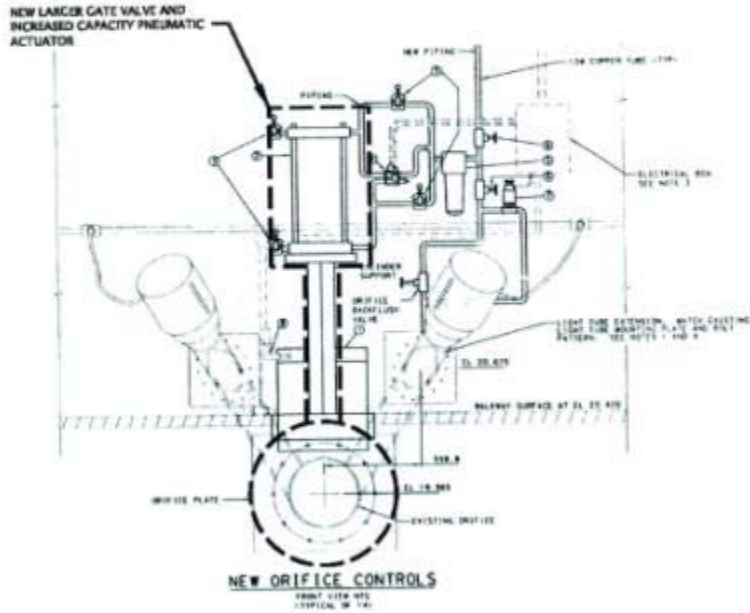
B2 Orifice Improvements
Reduce Effective Orifice Tube Length
Applied to All Alternatives



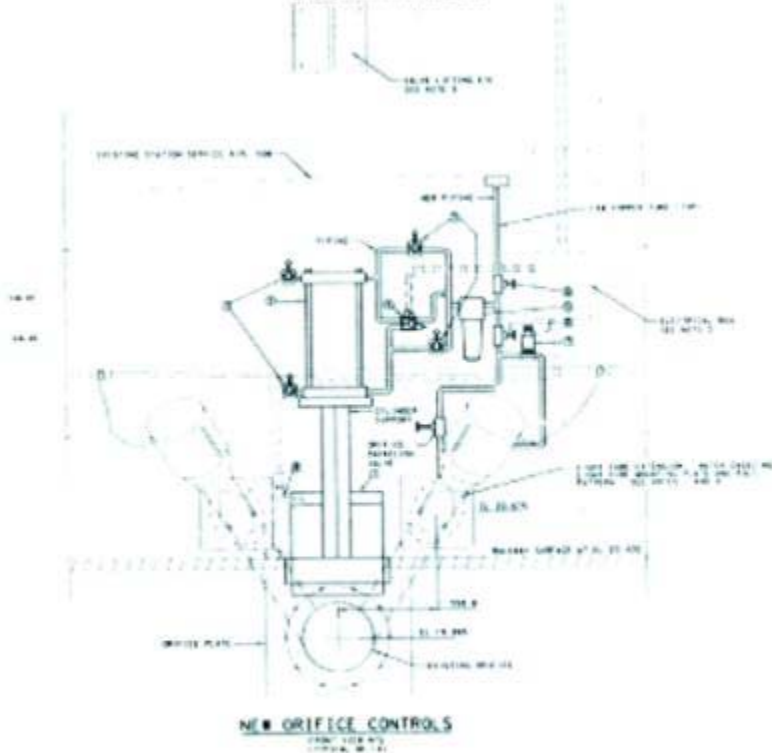
**Photo 1: Grey Actuators With
Concrete Chipped Away - All Alternatives.**
Offset = 0.6 inches



B2 Orifice Improvements Alternative #3



**B2 Orifice Improvements Alternative #4/#5
Recommended**



B2 Gatewell Slot Filler Design Progress Summary

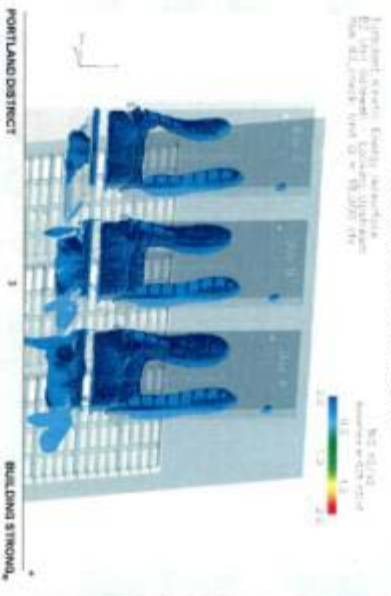
Gary Henkle
Hydraulic Engineer
CENWAP-EC-HQ
12/02/11



US Army Corps of Engineers
BUILDING STRONG

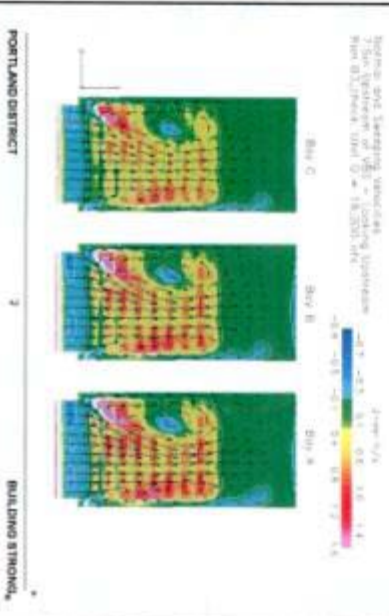
Baseline Conditions

Hydraulic Model: Energy Dissipation
E2-V11 (Baseline) - CENWAP-EC-HQ
Run ID: 10018 - 1/18/11 - 18:20:55



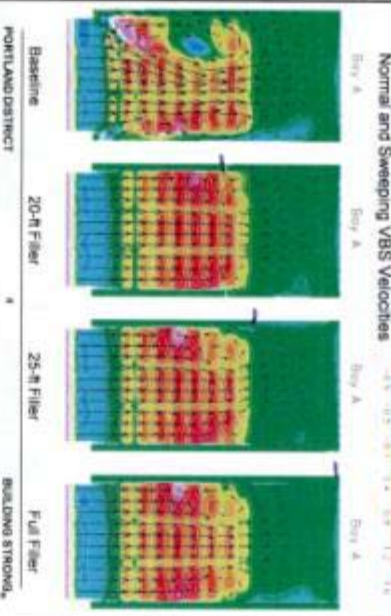
Baseline Conditions

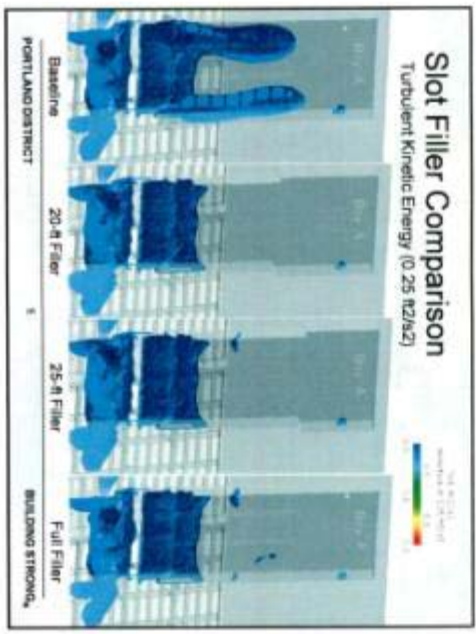
Hydraulic Model: Sweeping Velocities
E2-V11 (Baseline) - CENWAP-EC-HQ
Run ID: 10018 - 1/18/11 - 18:20:55



Slot Filler Comparison Normal and Sweeping VBS Velocities

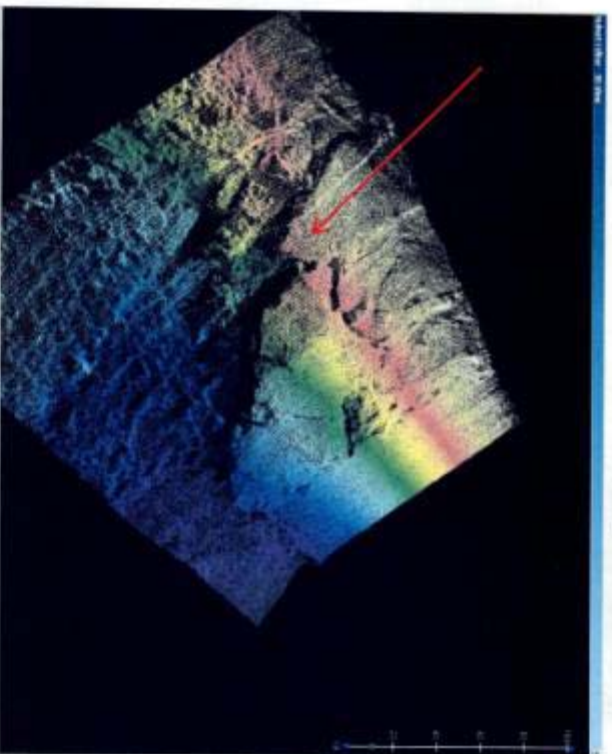
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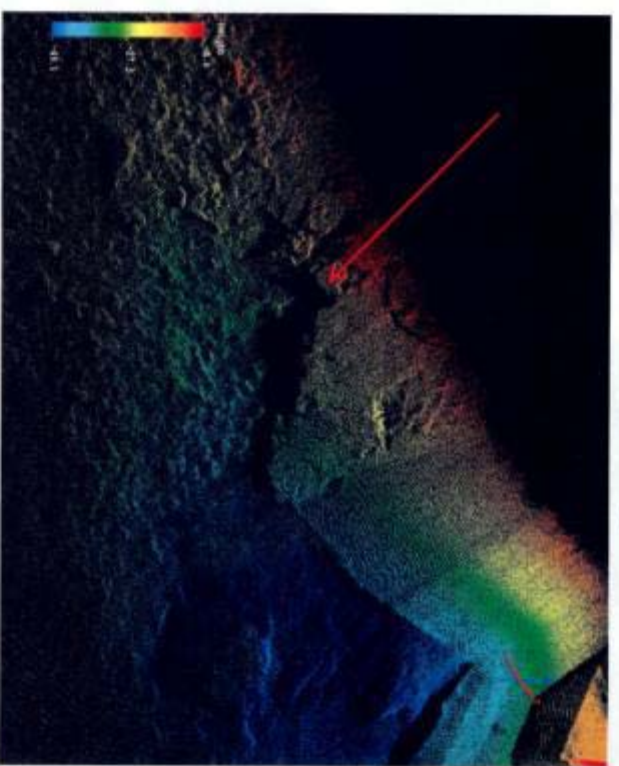


2011 Hydro-Survey Cascades Island Revetment

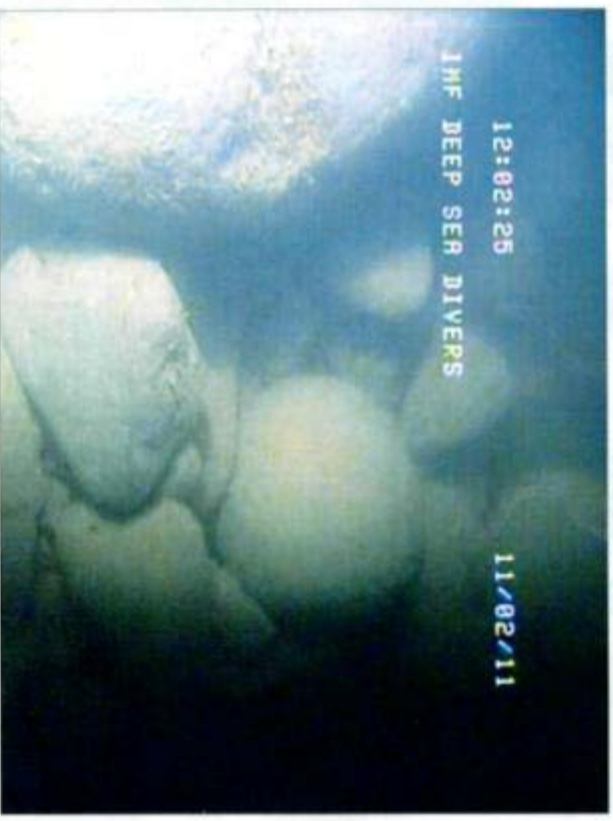
2011 Survey



2010 Survey

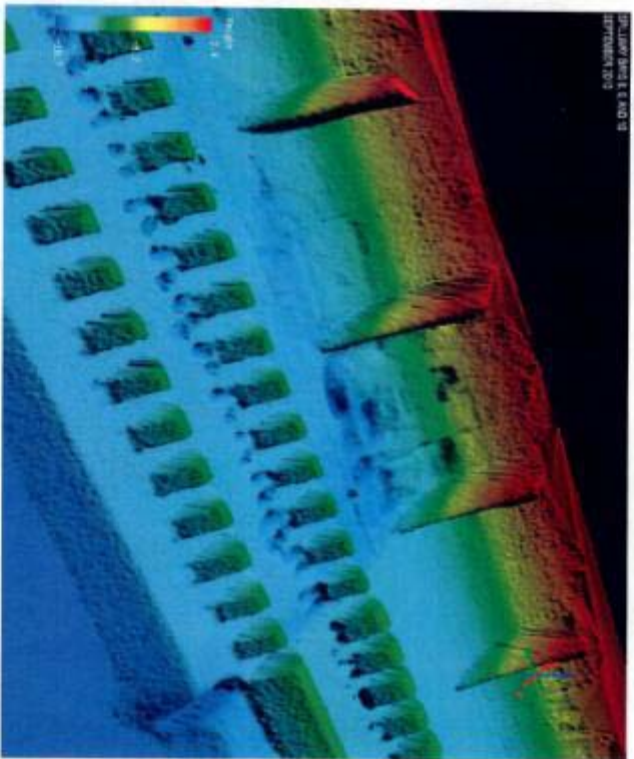


Dive Survey Material in Bay 9

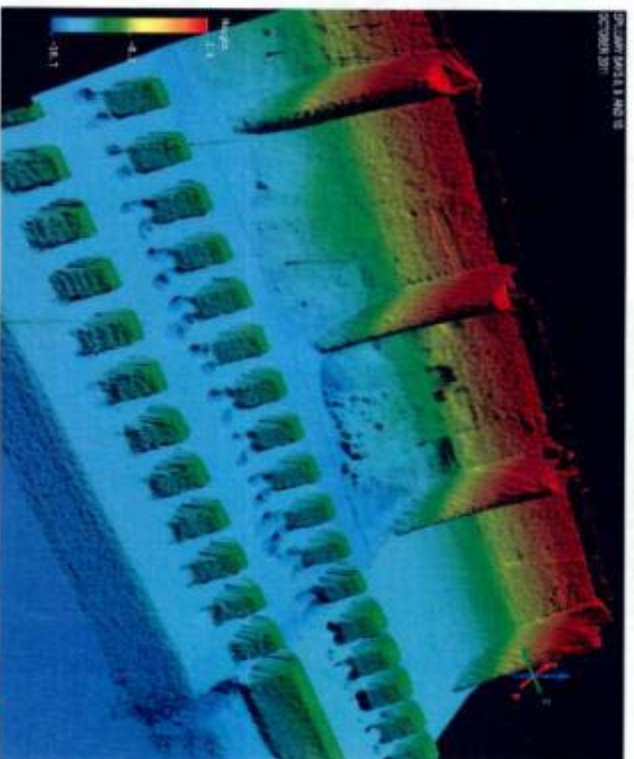


2011 Hydro-Survey Accumulation of Material in Bay 9

2010 Survey



2011 Survey

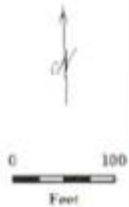


Bonneville Dam Spillway Stilling Basin

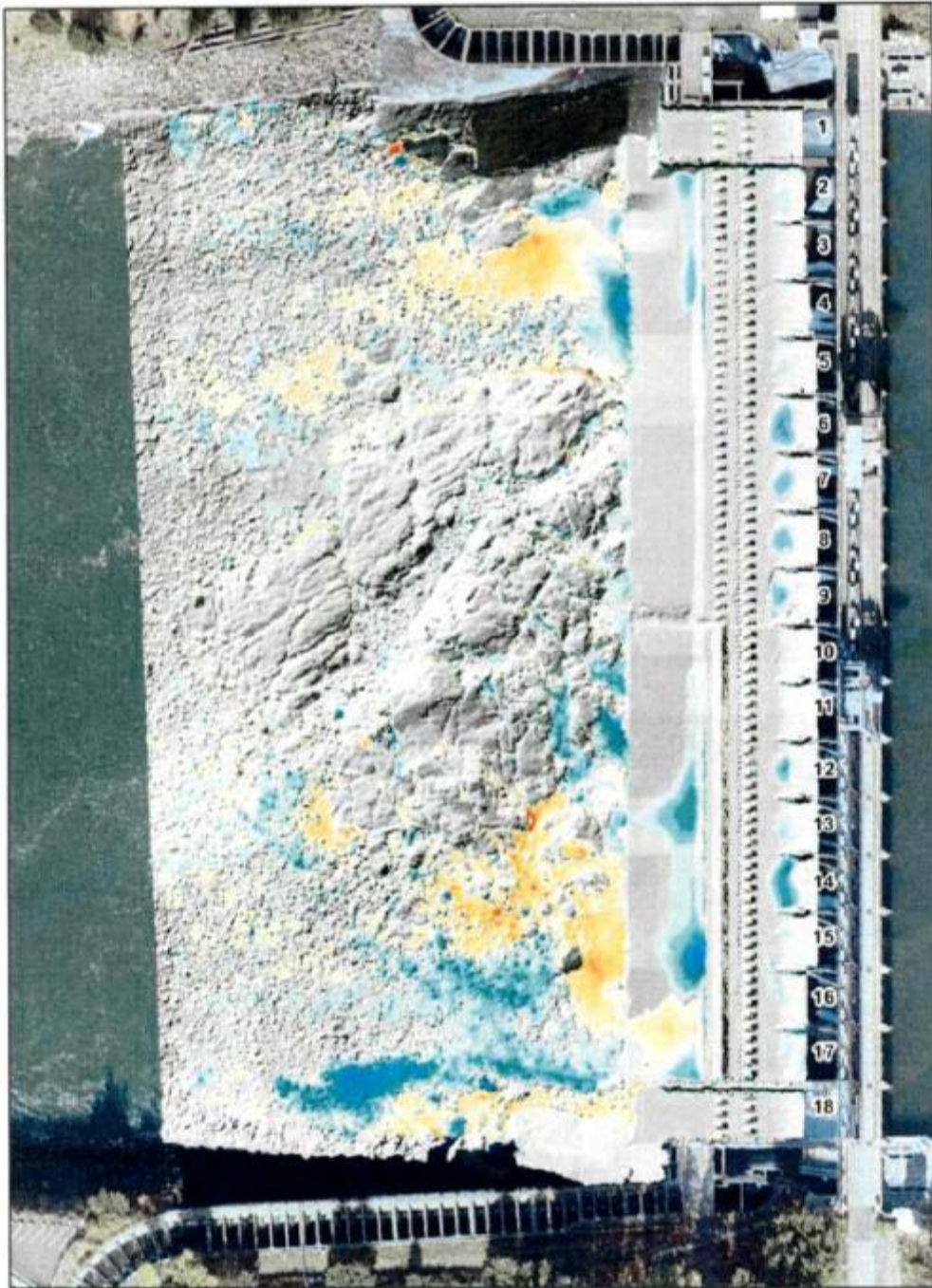
Change in Elevation (Feet) Between September 2010 and September 2011



NOTE:
Negative values denote a negative change in elevation, or a loss of material.
Positive values denote a positive change in elevation, or a gain of material.




US Army Corps of Engineers
Portland District



Difference Plot 2011 vs. 2010

Change in surface elevations between September 2010 and September 2011. Warm colors show a loss in elevation, cool colors show a gain in elevation. During this time period, there was approximately 11,600 cubic yards of cut and 10,300 cubic yards of fill for a net flux of -1,300 cubic yards through the study area.

B2 Orifice Improvements - Alternatives Matrix (17 August 2011 FFDRWG comments included in red)

Weighting Factors - Used on Top 5 of Initial Scores =		3	2.5	2	1	1	1	1		Top 6 Alternatives	Additional Rated Item - Weighting = 1	Top 3 Alternatives		
Alternatives		Rated Item	Rated Item	Rated Item	Rated Item	Rated Item	Rated Item	Rated Item			Rated Item			
Concept	No.	Description	Orifice Ring Size	Observable Passage Route	Fish Condition With Modification	Alignment With DSM Criteria	Technical Viability	O & M Cost	Ease of Testing Proof of Concept	Construction Timing	Comments	Total Score for all Alternatives - No Weighting	Construction Cost -- (Added to top 5 scored alternatives only)	Top 5 Total Scores With Construction Cost Added and Weighting Factors Applied

Alternatives That Allow Observable Passage Route

Aerate Free Jet to Provide Observable Passage Route Downstream of Orifice	1	Add Compressed Air to Orifice Tube	13"	3	3	3	2	0	3	3	Ability to provide and maintain necessary air would be impractical due to space requirements, O&M costs & risk of compressor outage	17	1	31.5
	2	Vent Orifice Tube Using Existing Light Tube Ports	13"	2	2	3	2	3	3	3	Not likely enough air could be pulled in through light tubes based on field tests	18	3	31
	3	Re-Core Orifice Tube to Larger Size	13"	3	4	3	3	3	3	1	Larger orifice ring size with larger diameter tube preferred by several members of FFDRWG - more similar to original design ring to tube diameter ratio and less potential for debris blockage	20	0	35
Aerate Free Jet to Provide Observable Passage Route Downstream of Orifice + Add More Opportunity for Exposure With Additional Orifices	4	Reduce Orifice Ring Size <= 12" & Open Additional Orifices as Needed	<= 12"	3	3	2	4	2	3	3	Possibly more debris blockage; Concern with increased adult fallback injury with smaller orifice rings	20	2	34.5
	5	Increase Capacity of DSM, Reduce Orifice Ring Size <= 12" & Open Additional Orifices as Needed and/or Add Gates/Rings to Additional S. Entrances	<= 12"	3	3	2	3	2	3	3	Possibly more debris blockage; Concern with increased adult fallback injury with smaller orifice rings	19	2	33.5
Provide Observable Passage Route Upstream of Orifice	6	Cameras in Gatewell for Visual Inspection Upstream In Conjunction With Alt. # 9	13"	4	3	3	1	1	3	2	Large O&M cost and interference with existing fish operations, therefore not included in top 5	17	x	x
	7	Pressure Transducers Across Orifice Openings In Conjunction With Alt. #9	13"	3	3	3	1	1	2	2	Interest in full flow option, but concern with debris jamming inside and whether debris blockage at entrance could be "seen"	15	x	x
	8	Sonic/Acoustic Sensors Across Orifice Openings in Conjunction With Alt. # 10	13"	3	2	3	1	1	2	2	Would require full pipe/tube flow in conjunction with Alt #10	14	x	x

Alternatives That Reduce jet Impingement in Conjunction With Alternatives 6-8

Reduce Jet Impingement in Conjunction With Alts #6-7	9	Tube Insert in Bottom to Support Bottom of Jet to the full length of Tube	-	x	x	x	x	x	x	x	As Alts 6-8 have lowest Ratings - These add-on alternatives are not ranked.	x	x	x
Reduce Jet Impingement in Conjunction With Alt. # 8	10	Rounded Entrance Tube Insert Flowing Full in conjunction w/ Alt. # 8 only	-	x	x	x	x	x	x	x	As Alt #8 has lowest Rating - This add-on alternative is not ranked. Interest in full flow option, but concern with debris jamming inside and whether a debris blockage at entrance could be "seen"	x	x	x

Alternatives That will be Included With any Chosen Alternative

Reduce Potential for Jet Impingement in Conjunction With Chosen Alternative	11	Reduce Effective Orifice Tube Length by Removing Wall Concrete at Exit For ~17 N. Orifices in Units 12-15 as well as all working S. Orifices.	-	No Ranking - Assumed to be Ancillary to any Alternative.							Field assessments indicate existing orifice exits with this installation provide better jet hydraulics in S. Orifices especially for low TW. Assumed repositioning existing gates would be extension of current as built design and ancillary to chosen alternative.	x	x	x
Increase Fish Attraction in Conjunction With Chosen Alternative	12	Replace Orifice Rings with Light Emitting Orifice Rings	-								Testing at McNary Dam in 2010 showed high potential for attraction and deemed ancillary to chosen alternative.	x	x	x

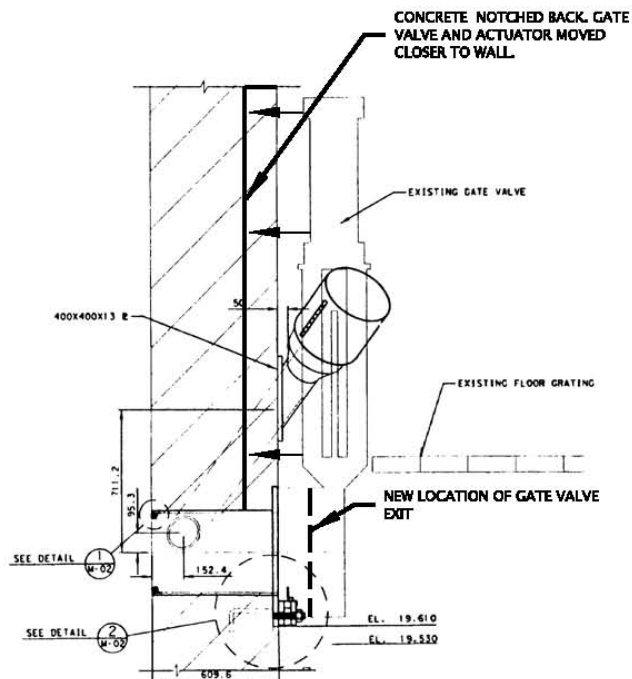
NOTES:

22	Alternatives 9-10 not considered viable alternatives as they would only be used in conjunction with alternatives 6-8 that had the lowest ratings.	Criteria for Ranking:
X	No ratings for these alternatives as they are paired with alternatives 6 - 8 which were ranked low.	General Scoring:
	Top 6 Scores for 7 rating categories (no weighting or construction cost)	Cost Scoring:
	Of the Top 6 Scores: Top 3 Scores for 8 rating categories and weighting (added construction cost)	high = 0
	Ancillary features to be included in chosen alternative	Poor = 1
Concern with injury	Comments from FFDRWG, 17 August 2011	Medium-High = 1
		Fair = 2
		Good = 3
		Low-Medium = 3
		Excellent = 4
		Low = 4

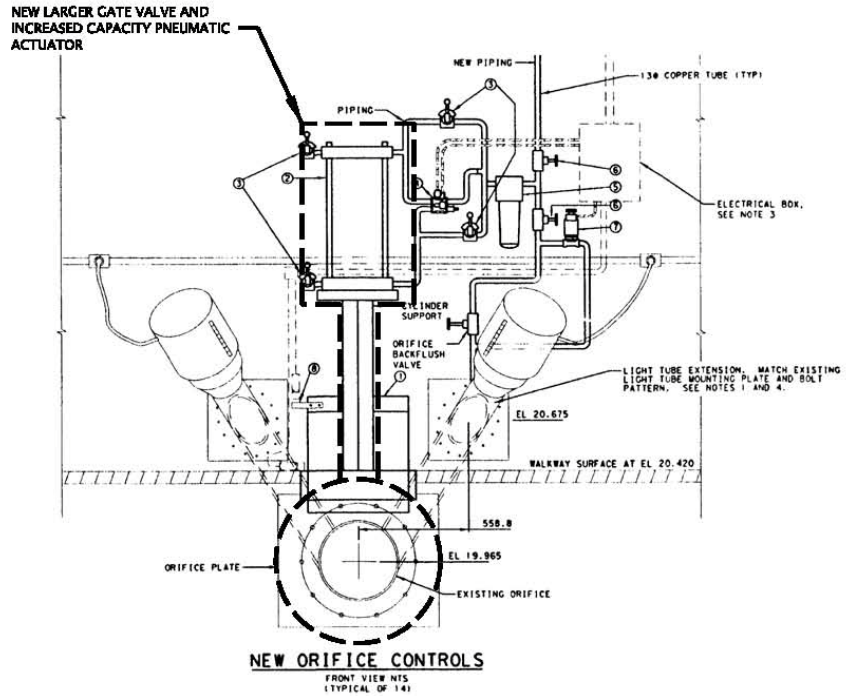
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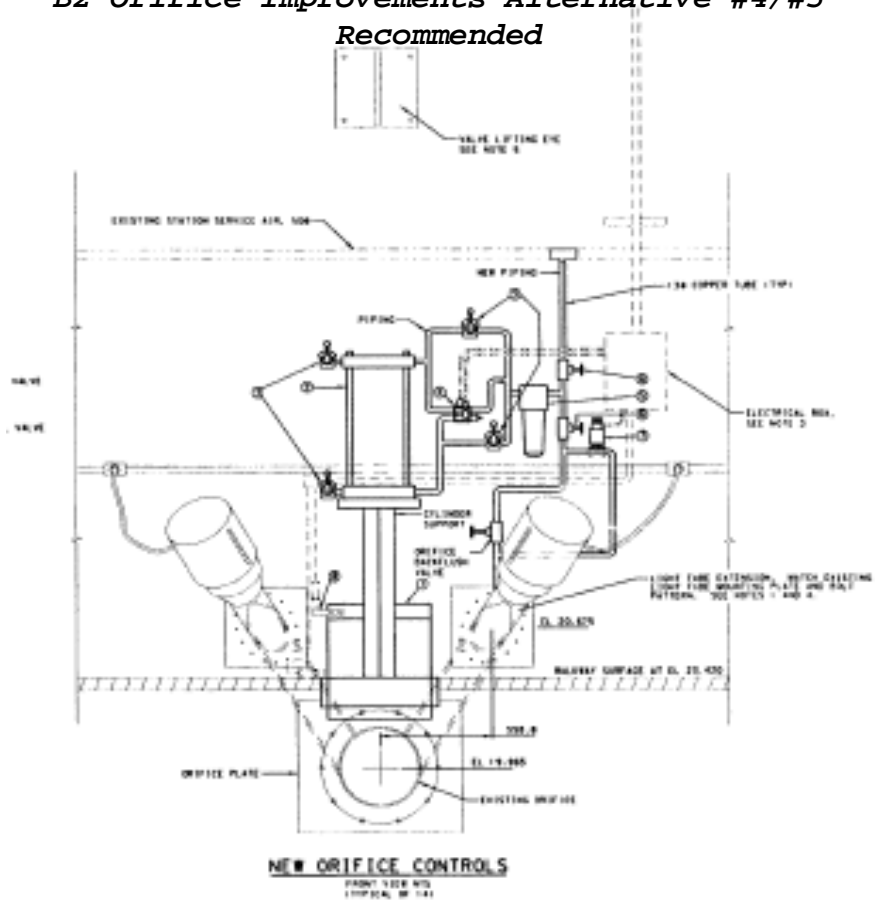
**Photo 1: Grey Actuators With
Concrete Chipped Away - All Alternatives.**
Offset = 0.6 inches



B2 Orifice Improvements Alternative #3



**B2 Orifice Improvements Alternative #4/#5
Recommended**



B2 Orifice Improvements 2012					
Preliminary Cost Estimate (Rounded to 100,000\$)					
Prepared by: RLR					
10/25/2011					
Modified by: KAK 11/23/11					
Alternatives	Alternative #3	Recommended Alternative Alternative #4	Alternative #5	Alternative 11-only	Alternative 12-only
Physical Description	<i>Re-core opening for 18" ID pipe ; Minimize overall pipe length; Replace 12 5/8" orifice rings With 13" LED orifice rings.</i>	<i>Minimize overall pipe length; Replace 12 5/8" orifice rings with 12" LED orifice rings; Add gates to currently blind flanged orifices; Operate with additional orifices to maintain current channel operation/flow.</i>	<i>Minimize overall pipe length; Replace 12 5/8" orifice rings with 12" LED orifice rings; Add gates to currently blind flanged orifices; Modify screen velocity criteria for part of fish passage season to operate with additional flow allowing additional orifices to open.</i>	<i>Minimize overall pipe length.</i>	<i>Replace 12 5/8" orifice ring with LED orifice ring.</i>
(costs rounded to \$100k)	Alt 3 (42 Orifices Modified)	Alt 4 (49 Orifices Modified)	Alt 5 (56 Orifices Modified)	Alt 11 only (42 Orifices Modified)	Alt 12 only (42 Orifices Modified)
Direct Costs	\$4,000,000	\$2,100,000	\$3,000,000	\$900,000	\$1,500,000
Markups (Overhead, Profits, Bond, tax, OT)	\$2,200,000	\$1,100,000	\$1,600,000	\$500,000	\$800,000
SUBTOTAL COSTS	\$6,200,000	\$3,200,000	\$4,600,000	\$1,400,000	\$2,300,000
CONTINGENCY (35%)	\$2,200,000	\$1,100,000	\$1,600,000	\$500,000	\$800,000
TOTAL ESTIMATE CONSTRUCTION COST	\$8,400,000	\$4,300,000	\$6,200,000	\$1,900,000	\$3,100,000