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Managing Water in the West

Bighorn Lake Sedimentation Study – Joint Proposal

Presenter: Dominick Enzenbacher



U.S. Department of the Interior
Bureau of Reclamation

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Bighorn Lake Sedimentation Study

- **Objectives**

- Sediment management to maintain recreation at Horseshoe Bend
- Provide a means for sediment to be reclaimed for topsoil
- Investigate long term sustainability of sediment management for the reservoir

- Requested by Reclamation's Montana Area Office
- Prepared by Reclamation's Technical Service Center and US Corps of Engineers, Omaha District

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Alternative 1

- Force Channel to the west side of HSB using a dike

Objective

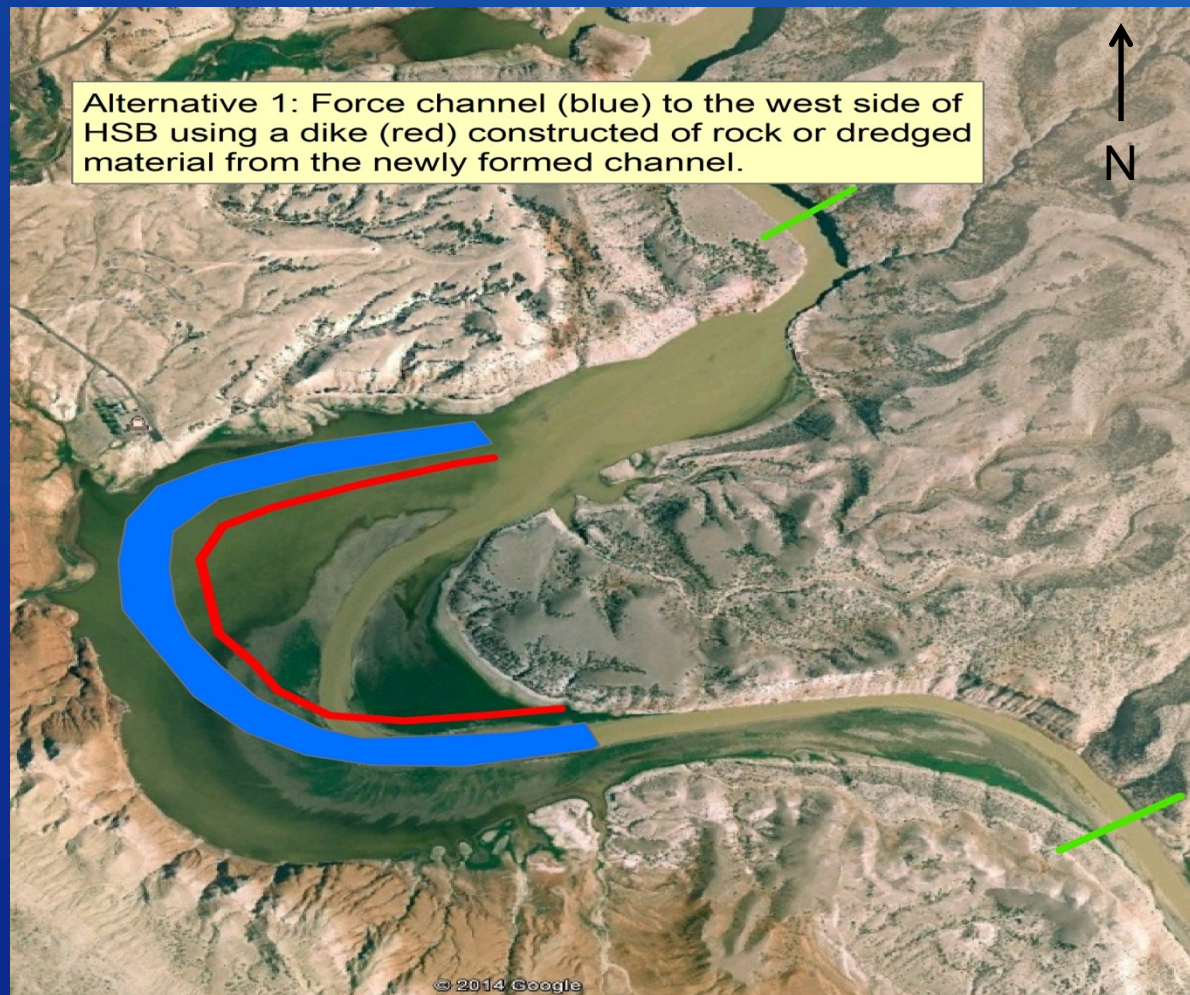
- Provide a means for efficient transport of incoming sediment through the western portion of the HSB Recreation Area

How

- Alternative 1A (Figure 1)
 - Construct longitudinal dike using rock
 - Force channel to the west side of HSB
- Alternative 1B (Figure 1)
 - Construct longitudinal dike using lake sediment
 - Force channel to the west side of HSB

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Alternative 1:



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Alternative 2

- Force all flow to the east side of HSB using a dike

Objective:

- Force all flow and sediment to the east side of the reservoir

HOW:

- Construct longitudinal dike
- Force all flow to the east side of HSB

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Alternative 2:



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Alternative 3

- Sediment removal with Flow barrier dikes

Objective:

- Trap sediment upstream of the Lovell Causeway

How:

- Alternative 3A (Figure 3)
 - Use the Lovell Causeway as a dam to impound water and trap sediment
- Alternative 3B (Figure 3)
 - Evaluate the construction of alternating flow barrier dikes upstream of the Lovell Causeway

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Alternative 3:



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Alternative 4

- Sediment removal without flow barrier dikes

Objective:

- Excavate sediment from upstream of the Lovell causeway

How:

- Excavate the necessary sediment from the reservoir delta upstream of the causeway

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Alternative 5

- Sustainable Reservoir Sediment Management

Objective:

- Investigate alternative solutions to reservoir sedimentation and sustainability

How:

- Passing inflowing sediments through the reservoir
- Sediment dredging at HSB and transported past the dam to disposal sites

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Cost Estimate Breakdown

	USACE Analysis	BoR Analysis	Data Collection	BoR Report*	Estimated Cost**
Alt. 1	\$15,000	\$85,000	\$54,045 \$38,277	\$23,000	\$183,345 \$167,577
Alt. 2	\$15,000	\$85,000	\$54,045 \$38,277	\$23,000	\$183,345 \$167,577
Alt. 3	\$15,000	\$85,000	\$104,045	\$23,000	\$233,345
Alt. 4	-	\$18,000	-	\$9,000	\$33,300
Alt. 5	-	\$49,000	-	\$15,000	\$67,300

* The cost for each report has been evaluated assuming only one alternative is selected. The cost of a report for multiple scenarios will be less than the sum of the individual reports

**Includes cost of presentation of results in Billings/Lovell

NOTE: This Cost Estimate Breakdown is just for the planning study and doesn't include Final Design or Implementation (Construction Cost)

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Next Steps & Questions?

- **Sedimentation Committee**
 - Identify alternatives from proposal to study
 - Propose new alternatives to study
 - Identify Funding sources for Bighorn Sedimentation Study

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Contact Information

- **MTAO Contact: Dominick Enzenbacher**
 - 406-247-7306
 - denzenbacher@usbr.gov

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References:

- Ferrari, Ronald L. (2010). *Bighorn Lake-Yellowtail Dam: 2007 Sedimentation Survey*. Technical Report No. SRH-2010-12. US Bureau of Reclamation, Technical Service Center, Sedimentation and River Hydraulics Group, Denver, CO.
- US Army Corps of Engineers for the US Bureau of Reclamation. (2010). *Bighorn Lake Sediment Management Study*. Final Technical Report. US Army Corps of Engineers, Omaha District Hydrologic Engineering Branch, Sedimentation and Channel Stabilization Section, Omaha, NE for the US Bureau of Reclamation, Great Plains Region, Montana Area Office, Billings, MT.
- US Army Corps of Engineers. (2012). *Bighorn Lake: Sediment Management Reconnaissance Study Scope*. US Army Corps of Engineers, Omaha District Hydrologic Engineering Branch, Sedimentation and Channel Stabilization Section, Omaha, NE.

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