

# Big Hole River Diversion Dam Replacement Project Update

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The City and County of Butte-Silver Bow (BSB) has completed an Environmental Assessment (EA) for the proposed Big Hole River Diversion Dam project in accordance with the National and Montana Environmental Policy Acts (NEPA/MEPA). The proposed project is to replace the existing Big Hole River diversion dam and intake structure in order to provide a reliable source of potable water for the Butte service area. The facility is owned and managed by BSB and is used to divert water from the Big Hole River to an adjacent pump sta-

tion located on the river's north bank. The pump station lifts the water to a treatment plant located outside the project area approximately 10 miles to the northeast. Treated water is then piped another 11 miles northeast to storage and distribution systems in Butte, MT, which provide the city's main source of potable water.

The **purpose** of the proposed project is to provide a reliable source of drinking water for the Butte service area and to improve safety at the site for maintenance personnel and public recreational use.

There is a critical **need** for the proposed project. The existing diversion dam and associated intake structure is approximately 80 years old and has outlived its useful life. Due to its age, the facility is in poor condition and poses an imminent threat of failure or malfunction, which would deprive the citizens of Butte of potable water. Apart from total failure of the diversion dam facility, icing problems in winter months can obstruct the intake gates and intake structure. Ice must be removed by hand to prevent blockage that would result in interruption of flow to the Big Hole Water Treatment Plant and treated water consumers.

The existing site design and maintenance requirements create unsafe working conditions for maintenance personnel during winter months.

The site is also unsafe for recreational users. The current configuration of the dam results in a turbulent area immediately downstream that is a life-threatening danger to boaters or recreationalists who might deliberately or inadvertently float or be swept over the dam.

The EA process has several distinct phases that are illustrated in the graphic below. The Project Team has completed a Draft Environmental Assessment that was made available for Public and Agency comment from December 10th, 2009 through January 15th, 2010. The Preferred Alternative presented in the Draft EA was Alternative Three which is described in more detail on the following pages. The Project Team anticipates that the FONSI will be completed in February 2010. The FONSI will include clarifications and revisions to the final EA document as well as formal responses to public and agency comments. The issuance of the FONSI will be publicized in the coming weeks.



The Preferred Alternative:

New Rock Weir Dam and Intake with Stepped Boat and Fish Passage Channel

Alternative 3 consists of a new rock weir dam consisting of a rock crest dam with a boat and fish passage channel located at the apex. The new dam would be chevron shaped with the nose of the dam located upstream. The fish and boat passage channel would consist of a "notch" through the dam that would be trapezoidal in shape and would extend from the upstream water pool through the dam section and blend into the downstream river channel.

The boat and fish passage channel width would be designed to allow boaters to float through with oars extended; boaters would not experience any inconvenience while passing through the spillway. The profile of the new weir structure would include two rest pools to gradually lose elevation down the rock face. The channel and rest pools would all be constructed from native rock grouted to form a natural channel in order to minimize visual impacts.

The rock dam would be visible during low flow conditions (<500 cfs) but completely submerged at higher flows.

A new concrete intake chute with submerged screens would be installed in the groin point of the dam along the north shoreline. The submerged intake screens would enable water flow into a collection box which would then be piped north and east into the existing pump station building. The operation of the intake would rely upon the consistent control of the upstream water surface elevation. This upstream water surface elevation would be maintained by a control valve located on the downstream end of the concrete chute.

This control valve will be an inflatable dam that would be mounted in the floor of the intake chute and pneumatically rise and lower via a bladder system. When fully deflated, the flow line of the chute would allow for unrestricted water passage past the intake screens; when fully

inflated, the gate would rise to the dam crest level, creating an increase in the upstream water surface elevation. The gate elevation could be varied dependent upon in-stream flows such that adequate volume and velocity of water could pass through the intake chute to enable adequate diversion, clearing of screens, and passage of ice and debris over the top of the gate, yet could be adjusted to enable flows over the new dam.

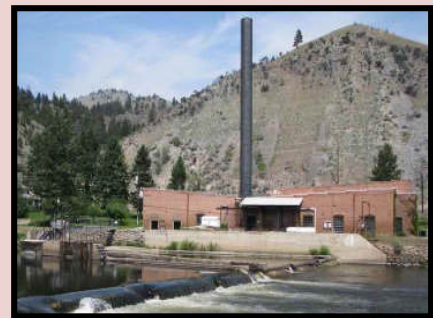
Alternative 3 would evolve over two separate phases. Phase I would remove the existing diversion dam and replacement with the new rock weir dam and intake and associated

boat and fish passage channel. Phase I would also include construction of new primary and secondary intake systems and new transmission piping from the intake system to the existing pump station with provisions for connection to a new pump station in the future.

Phase II would involve construction of a new pump house located to the northeast of the existing pump house. Upgrading the existing pumps and relocating to the new building or new pumps, piping and controls would be a part of the new pump house. Upon completion of Phase II, all water delivery components would be removed from the existing pump station and the historic old pump house would be preserved and protected for future generations. The timing of Phase II is dependent on funding.

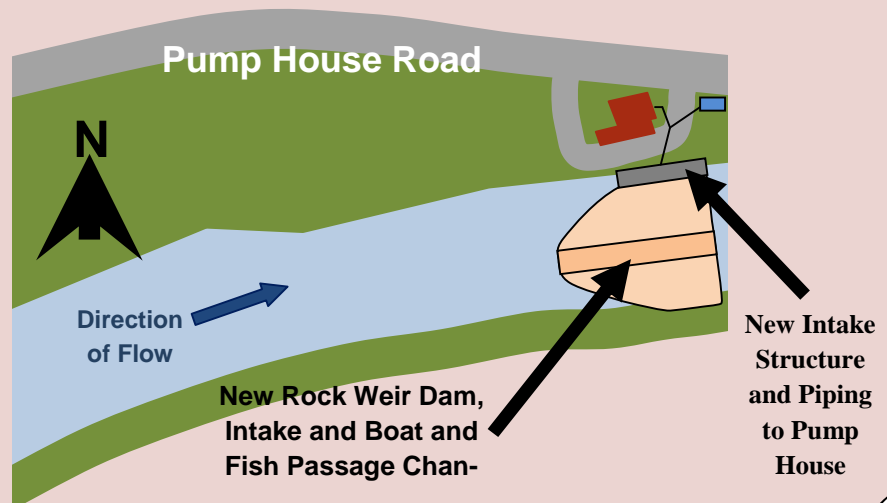


The intake chute control valve would only span the width of the intake chute (approximately ten feet).



The Big Hole River Diversion Dam and historic pump house

A graphical depiction of Alternative Three is shown below.



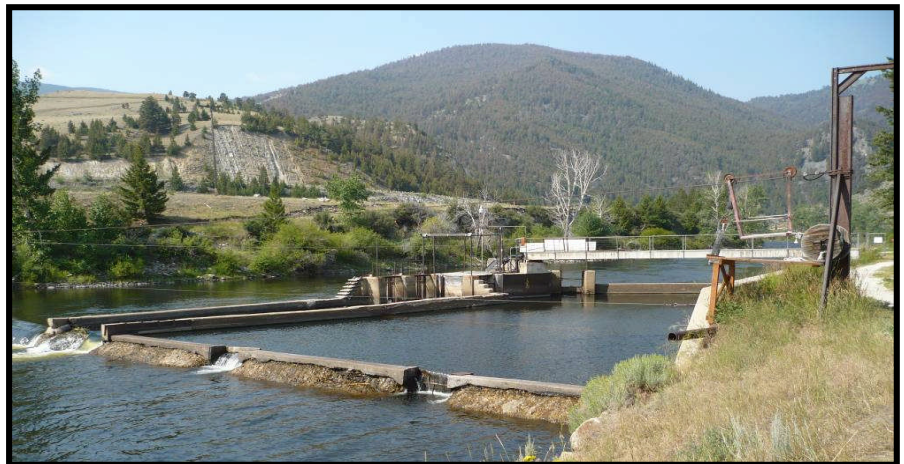
## Big Hole River Diversion Dam Replacement Project Final Design, Permit Acquisition, Bidding and Construction Efforts

### Design Activities

With the completion of the Environmental Assessment and selection of the Preferred Alternative, the Project Team has begun final design efforts. The design efforts will complete the in-depth engineering analysis and development of construction plans, details and technical specifications required for permit submittals and approvals. Final details of the dam construction, including physical configurations of the dam, its crest, weir elevations and boat and fish passage channels will be determined. In addition, final selection of construction materials, construction sequencing, and management of the river flows during construction will be considered, resulting in a complete construction drawing and design package that will be submitted through various agencies for their review, approval and permitting. This effort will build upon the already completed topographical surveys and mapping of the project area, geotechnical investigations, and hydrology and hydraulic computations to determine river flows, flood limits and correlated the calculated flows against flow records. The design effort will prescribe to the recommendations and determinations resulting from the cultural, historical and biological inventories of the affected reaches of the Big Hole River and surrounding area and will follow the requirements as outlined in the Environmental Assessment.

### Permitting Activities

As the design development nears completion, the Project Team will prepare permit applications and submit to the various Federal, State and Local agencies. These permit review cycles vary from several days to several months depending upon the complexity of the permit and the various agency requirements. The Project Team has been in consultation with the various agencies and has developed a preliminary listing of permits that are anticipated based upon the scope and breadth of the work anticipated. A listing of these anticipated permits is shown in the accompanying table.



### Anticipated Permits and Consultation Activities

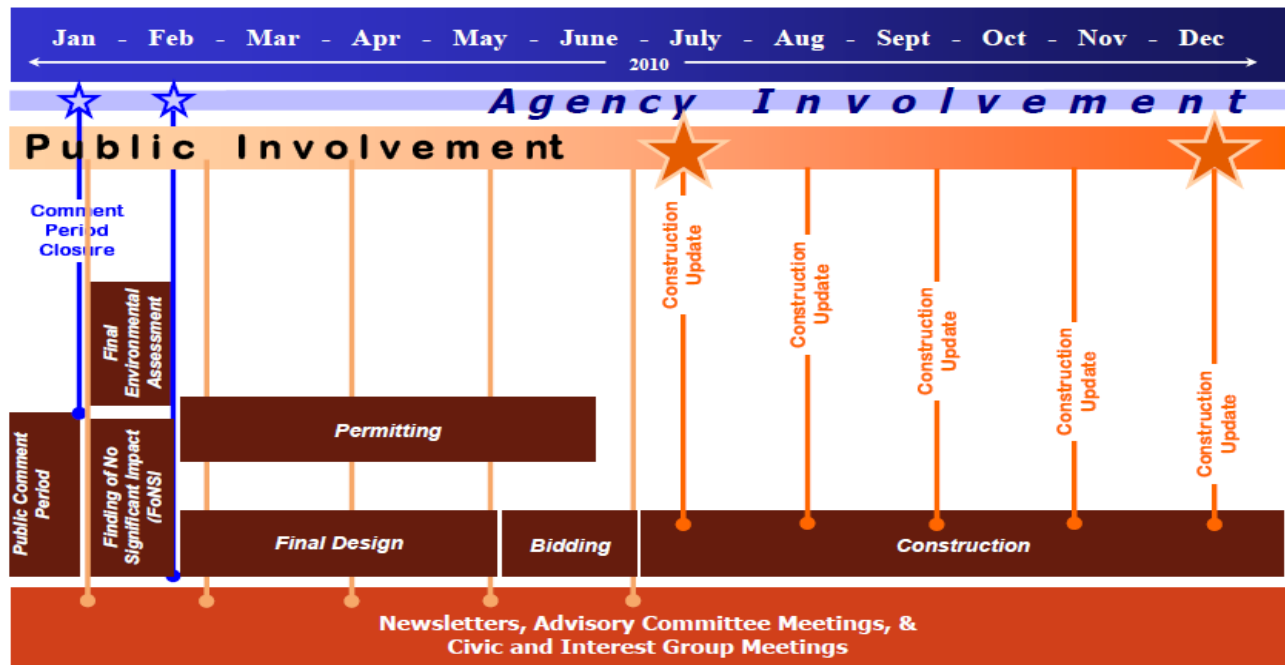
Agency	Permit
USACE (*)	Federal Clean Water Act Section <b>404 Permit</b>
DEQ	Federal Clean Water Act Section <b>401 Certification</b>
	Short-term Water Quality Standard for Turbidity ( <b>318 Authorization</b> )
	MPDES General Permit for <b>Storm Water Discharges</b> Associated with Construction Activity
	MPDES General Permit for Discharges Associated with <b>Construction Dewatering</b>
DNRC	Hard Rock Mining Exclusion
	Montana Land-Use License or Easement on Navigable Waters (Permanent License for <b>Historic Footprint</b> )
FWP	Montana Land-Use License or Easement on Navigable Waters (Temporary Easement for <b>Construction Activity</b> Outside Historic Footprint)
Silver Bow County	<b>SPA 124</b> Permit
Beaverhead County	<b>Floodplain</b> Development Permit
Historical Preservation Committee	<b>Floodplain</b> Development Permit
	<b>Demolition</b> Permit

(\*) As lead federal agency, USACE will conduct consultation activities with SHPO.

### Bidding and Construction Activities

The Project Team anticipates completing final design and construction packages in late Spring of 2010. As permit approvals are granted, the Project Team will advertise for construction bids from qualified general contractors. It is anticipated that the project will awarded in June of 2010 with construction to begin as soon as practical thereafter. The construction efforts will be sequenced to coincide with river levels and to maintain the existing facility in operation during construction so as to provide uninterrupted flow of water to the various water users and customers of Butte-Silver Bow. It is anticipated that the construction activities will continue from July through the end of the year with a completed facility in place and operational by December of 2010.

## Big Hole River Diversion Dam Expected Project Schedule



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#### How Do I Get A Copy?

As noted, this newsletter will be published periodically and can be received by e-mail. If you are interested in receiving this newsletter, please send your request to Dick Talley, P.E., DOWL HKM's Project Manager at dick.talley@hkminc.com. We will then maintain an email database and each updated newsletter will be sent to you electronically.



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