

**POWDER BASIN WATERSHED COUNCIL  
PROJECT COMPLETION REPORT  
OWEB 204-517  
02/09/06**

**a. Project Background**

The Powder Basin Watershed Council requested technical assistance funding to contract an engineering design to upgrade the Sumpter Municipal Diversion. As designed, the new structure will upgrade the existing diversion by installation of a fish screen, fish passage return and more efficient water control structures.

The site of the diversion is on US Forest Service land under use permit to the City. The current diversion structure was installed in 1969 and does not have either fish screen or passage provisions. The structure is located on a difficult site (inside corner) and the placement of the fish screen determined much of the design. The screen agreed upon is a horizontal flat plate.

Originally, the engineering design originally was to include the following components:

1. Site survey
2. Footprint for a fish screen to be designed and approved by ODFW
3. Fish return ladder (two way migration capability)
4. Retrofit of the current diversion structure with a mechanical water control device
5. Design specifications.

However, during the project (2004-2005) the ODFW could not spare the manpower to design the flat plate screen. The contracted engineer agreed to provide the screen design under the cost agreement in his original bid. ODFW provided oversight at every critical stage of design development.

As stated in the Technical Assistance application, this project continues to be a major priority for the Upper Powder River Watershed.

1. The City of Sumpter approached the watershed council in 2001 when the council was engaged in the watershed assessment there. They asked for assistance to upgrade the municipal diversion to current water quality and fish habitat standards.
2. Currently, the watershed council is working with a local work group on strategic action planning for the watershed. The diversion project was rated high priority in the Upper Powder River Watershed Preliminary Action Plan as well as in the new Draft Watershed Action Plan 2005-2007, January 19, 2006.
3. Upgrade of this diversion structure will be a major improvement for the maintenance of water quality standards (control of sediment and remediation of uncontrolled flood conditions) and fish passage connectivity in the McCully Fork reach of the Powder River.
4. OWEB is continuing the restoration work in this watershed which it supported in Cracker Creek by its 2001 grant award for “Cracker Creek Mining Area – Restoration Project.”

**b. Results expected from the engineering design for the Sumpter Municipal Diversion:**

The table below evidences the original goals for the design.

<b>Problem Identified</b>	<b>Improvement Needed</b>
1. The diversion structure is currently a fish passage barrier on the upper reaches of the Powder River.	Fish passage will be provided for in an engineering design for a fish return ladder.
2. Current diversion is not screened.	An efficient fish screen specifically designed for the site and conducive to the operational needs of the municipality will be installed on site.
3. Current structure is not adequate to meet the variant conditions of flood stages to low flows while meeting the demands of the water rights, water quality and fish habitat. Sedimentation cannot be effectively controlled.	The structure will be retrofitted with a mechanical gate to manage bedload passage and high water management.

**Problems Identified & Addressed:**

**1. Provide for fish passage:**

Effective and sustainable fish passage at this site will be achieved by restoration of the channel, itself, to a more naturally functioning condition as described in the “Methods Description” (page 3).

**2. Installation of a fish screen:**

Diverse stakeholders agreed on a horizontal flat plate fish screen approved by the City of Sumpter, the ODFW, the Forest Service and the US Fish & Wildlife Service. See “Methods Description” (page 3).

**3. Provide for remediation of destructive flood damage to infrastructure and address the demands of water rights, water quality, fish habitat and stream hydrology at the site:**

The approved design addresses the concerns of flood damage, water rights, sedimentation and fish habitat to the maximum enhancement allowed by the site as evidenced by the “Methods Description” (page 3).

## **Methods Description:**

The design calls for the existing concrete diversion structure to be removed and the point of diversion (POD) to be moved upstream approximately 70'. A new fish friendly structure will be installed at the new POD. The diversion structure will be a box headgate that utilizes a rock vane weir similar to the ones designed by Dave Rosgen. The box headgate will be located on the edge of the bank with a rock vane installed to act as a weir. Diverted water will pass through a headgate into a sluice box where water is to be measured using a ramp flume before entering a horizontal flat plate fish screen. Sediment will be removed using a vortex sediment tube located prior to the ramp flume.

The water will pass through the flat plate screen into a settling pond located prior to the filter beds. The settling pond will be realigned and resized. Minor modifications will be made to the filter beds to minimize water shunted through the waste channel. The river channel will be realigned to its historic plane and four more rock vanes will be added to provide grade control. The realigned channel will be reconstructed to proper channel morphology.

An existing overflow channel will be incorporated into the design. Sill rock will be placed upstream of the diversion in the old overflow channel to prevent cutting during flood events. The access road to the site which passes through the overflow channel will be graded and rocked to provide additional grade control. The realignment of the channel and incorporation of the overflow channel will reduce the risk of flooding the settling pond and filter beds.

### **c. Recommendations for more effective implementation of similar TA projects:**

We recommend highly that a *supervisory technical committee of stakeholders* be formed for a project of this complexity. One of our stakeholders (engineer consultant for the WC) stated that similar projects he had worked on had not come together so fast and efficiently.

As with all projects, however, there were notable frustrations ... basically in the area of *lack of agency continuity*. The only remedy we can think to apply to this problem would be *written* empowerment for agency representatives. Even if it were possible, however, to receive this commitment, insisting on written approval would likely inhibit trust within the committee during its formation and in its communications with the design engineer. Therefore we recommend conducting our next project in the same manner as this one while hoping that the problem will not arise in the next go-around.

We appreciate OWEB's own commitment to the Technical Assistance program. This needed and complex restoration project would not have been possible if these planning dollars had not been available.

**d. Lessons learned:**

1. Diverse input and approval from stakeholders is indispensable in a complex project.
2. The design committee should hire a PE that can communicate well with them and who is a team player.
3. People with similar goals do want to find common ground for agreement.
4. The State's "Oregon Plan for Salmon & Watersheds," as conducted under grant allocations from OWEB, is efficient and effective for maintaining and restoring watersheds.

**e. Description and explanation of changes to original proposal.**

1. Changes in expectation for the fish screen design are explained in (b.1.) above.
2. At the beginning of the project the primary stakeholders were identified as:
  - City of Sumpter
  - US Forest Service-WWNF
  - ODFW
  - Powder Basin WC

At the first meeting of the "supervisory committee," however, the team decided that it was necessary to have the US Fish & Wildlife Service at the table due to the designation of adjacent watersheds as Bull trout habitat.

3. Originally it was thought that fish passage would be provided by a fish return ladder. As the design developed to fulfill the specific needs at the site, however, it became apparent that the most effective fish passage would be achieved by restoration of the channel itself to a more naturally functioning condition.

4. As the design progressed, the supervisory committee advised that an "Operations and Maintenance Manual" be drafted for use by the City Utilities Department. The design engineer agreed that this could be done for a small increase in design cost. The manual is included on the engineering design disk provided with this report.

**f. Implementation of Sumpter Municipal Diversion project construction:**

Implementation is scheduled for fall of 2006. We are in the process of arranging for funding and permitting. At the time of our TA application, April 2006 was targeted for submission of a grant request to OWEB for implementation funds. We actually submitted the application in October 2005 and are approved to receive \$55,595 (#206-152). Our request to ODFW for Screening & Passage match funding was turned down but currently we have applications in for FRIMA (Fisheries Restoration & Irrigation Mitigation Act) funds and NFWF (National Fish & Wildlife Foundation) funds under the "Bring Back the Natives" program.

Our tentative schedule for 2006 implementation is:

- Jan – April: finalize funding and permitting requirements
- March – April: form construction oversight committee and draft contract
- May: negotiate construction contract  
pre-monitoring assessment
- August – September: construction
- October: post construction monitoring & final project report
- October-February '07: E&O Committee for project designs and builds kiosk informational display on municipal water & project
- May & October 2006-2009: project monitoring & evaluation

**g. List of products provided with this final report.**

CD-ROM:

- Engineering Design for the Sumpter Municipal Diversion
- Engineering Specifications
- Operations and Maintenance Manual for the City of Sumpter Utilities Department

**(2) Design is PE certified.**

**(3) Fiscal Accounting Enclosed by Doni Clair**

**Baker County Association of Conservation Districts**