



Modernizing Idaho's Water Infrastructure

An Ongoing Story Series on the Idaho Water Resource Board's Aging Infrastructure Grant Program **ISSUE NO. 11**

Portneuf Marsh Valley Canal Co. Spillway Rehabilitation Project

Overview: Portneuf Marsh Valley Canal Company provides water to 5,103 acres of farmland using 28 miles of open canal from the diversion on the Portneuf River. The canal company stores water in Chesterfield Reservoir in the neighboring Portneuf Valley. The reservoir is impounded by Portneuf Dam, which was built between 1910-1912. The dam was raised in 1950 to increase storage capacity.

Chesterfield Reservoir receives inflow from the upper Portneuf River watershed as well as the Toponce Creek, a tributary to the Portneuf River, via a diversion and approximately 5 miles of open canal. The reservoir stores up to 21,500 acre-feet of water and typically fills near the end of May.

The Portneuf Marsh Valley Canal Co. typically delivers water to shareholders from May through September. However, system operations continue in the off-season due to storage and maintenance



Contractors pour concrete pad for new spillway. A flood event in Spring 2023 undermined the safety and performance of the old spillway. (photo courtesy Portneuf Marsh Valley Canal Co.)

needs. Water rights allow diversion for winter storage beginning in September. Water is diverted from Toponce Creek, and the Toponce-Chesterfield Canal carries the water to Chesterfield Reservoir throughout the winter.

Stored water is a significant resource to the canal company because its water right on the Portneuf River is a junior water right. The stored water

in Chesterfield Reservoir becomes the primary water source for canal company customers in late summer and provides the company with the ability to extend its water supply for producers through the irrigation season.

The spillway for Portneuf Dam, built in 1990, was constructed of reinforced concrete. The channel below the spillway had little to no rock-armoring.

Major flood event in 2023 undermines spillway: The Winter of 2022-2023 featured major snowpack and spring runoff in the

- **Type of project:** Spillway rehabilitation for Portneuf Dam/Chesterfield Reservoir, plus diversion and channel improvements.
- **Location:** Chesterfield, Idaho
- **Total project cost:** \$1.8M
- **AIG:** \$625,000
- **Other funding partners:** NRCS EQIP, private loan
- **Start date:** April 2024
- **End date:** December 2024



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Portneuf Marsh Valley Canal Co. new spillway (cont.)

Portneuf River Basin. The snowpack accumulation ranked in the top 5 since record-keeping began. In late May, the Portneuf River peaked at 948 cubic feet per second (cfs).

On May 20, 2023 Chesterfield Reservoir began to pass flood flows in the spillway. Early in the morning of May 31, system operators were notified of significant erosion at the spillway by a neighbor. Caribou County Emergency Services was immediately notified. The Toponce-Chesterfield canal was breached to reduce inflows into the reservoir, as the aging diversion structure would not allow full dewatering of the canal. The low-level outlet was opened, and rock was placed to armor the scour hole in the channel.

Regulatory agencies issued a filling restriction and instructed system operators to lower the reservoir to six feet below the spillway crest. The reservoir dropped to the required level in late June.

Filling restrictions reduced the storage-capacity of the reservoir to approximately 14,500 acre feet, or roughly 66% of the full storage amount. These limitations, as well as the increased potential for dam failure due to embankment erosion, were a source of significant motivation for the canal company to repair the dam and spillway and protect against future incidents.

The project involves three main categories of work:

- Spillway replacement and embankment repair.
- Channel improvements



An Idaho Department of Water Resources safety engineer inspects the spillway damage following the 2023 flood event. (photo by Cindy Clark)

• Diversion improvements

Rehabilitation work will repair existing damage, protect against future damage and improve system operations to better control inflow to the reservoir.

Project benefits include:

- Increased public safety. Failure of the dam would cause significant property damage and potential injury or loss of life.
- Water supply sustainability for irrigation of 5,103 acres of farmland and a 1.6 MW hydropower generation facility that uses Portneuf Marsh Valley CC water.
- Restoration of storage in the reservoir. Once the project is completed, filling restrictions can be lifted.
- Full storage allows water from wet years to be used in dry years and aids in drought resilience for water users in the area.
- Updated diversion structure will

allow dam operators to simplify management and allow for operational flexibility.

- Recreation on Chesterfield Reservoir will benefit due to increased safety.

- Improved recreation along the Portneuf River. The river is enjoyed by many visitors to Lava Hot Springs. Water supplied from the reservoir impacts the ability of recreational river users to safely float the river. Increased storage capacity promotes a consistent recreational season and maintains economic values.

- Maintaining current water quality in the Portneuf River. The canal company's stored water in the reservoir provides significant flows for the Portneuf River in late summer and provides improved water quality for resident fish and wildlife.

For more information, contact the Portneuf Marsh Valley Canal Co., 208-851-0348.