

In-Conduit Hydropower Feasibility Study Fact Sheet

The City of Bend evaluated potential locations for in-conduit hydropower generation within the City of Bend municipal water system. The study provides a basis for the City to consider whether to proceed with developing in-conduit hydroelectric generation systems at the Outback Water Filtration Facility (WFF) and other possible locations within the distribution system. The study recommends an in-conduit hydropower configuration for the City and lays out the required process for implementation.

The study considers system operations, current technologies and the economics of in-conduit hydropower facilities. It evaluated incentives for construction, the operation of renewable energy facilities and all necessary permitting and licensing requirements.

Completing this study is a 2023-2025 City Council goal and a 2022-23 Council goal prioritized pursuing opportunities for renewable energy generation, sustainable design, and resiliency on City properties and facilities.

What is In-Conduit Hydropower?

In-conduit hydropower uses equipment such as existing pipelines, irrigation canals, and water pipes in the process of generating electricity. In-conduit hydropower projects don't require a dam and have negligible environmental impacts. The in-conduit hydro permitting process has been simplified since these projects recover energy that is otherwise removed from the existing system.

No additional surface water would be diverted for generation of hydropower beyond what is authorized and used to meet the City's municipal demands.

What Was Studied?

- **System Analysis and Site Screening**

The Outback WFF was identified as a clear candidate for in-conduit hydropower due to its high flows through existing energy dissipation facilities. The report identified other sites within the water system through a screening process that reviewed locations with significant flow and pressure drop and their daily flow patterns. Nine initial sites were screened down to four with the greatest energy production potential.

- **Institutional and Regulatory Features**

In-conduit hydroelectric power generation is regulated by state and federal rules. The Federal Energy Regulatory Commission (FERC) regulates power generation at the federal level. In-conduit hydropower projects in Oregon are regulated by the Oregon Water Resource Department (OWRD). Independent power producers must also work with their local utility to connect their power projects to the electric grid.

- **Technical Feasibility**

The study investigated the technical feasibility of viable sites in detail. Considerations included equipment, hydraulic characteristics of each location, and several options on how to utilize the power generated.

- **Environmental Benefits**

In-conduit hydropower facilities would not increase diversions from Bridge Creek. No additional environmental impact due to in-conduit hydropower construction or operation is anticipated. Because the proposed facility is located on an existing pipeline, land disturbance is already accounted for.

Offsetting the City's energy consumption with carbon-free in-conduit hydropower would reduce greenhouse gases and aligns with the City's Community Climate Action Plan and City Council goals. The Outback Facility alone has the potential to produce enough renewable energy for approximately 750 homes each year.

Feasibility Study Results

The in-conduit hydropower feasibility study report provides recommended next steps for each site. The study concludes the following:

- Two of the four sites evaluated are currently viable and technically feasible: The Outback site and the Awbrey Reservoir site.
- The Outback site is economically feasible. If pursued, the anticipated benefits include offsets of existing power use, significant power sale revenue due to excess power generated above on-site demands, increased use of renewable energy, and improved resiliency against power failures caused by natural disasters.

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Accommodation Information for People with Disabilities

To obtain this information in an alternate format such as Braille, large print, electronic formats, etc. please contact Austin Somhegyi at asomhegyi@bendoregon.gov or 541-323-8555; Relay Users Dial 7-1-1.