In January 2004, AQFlow carried out a preliminary set of diagnostic measurements to determine the best configuration of the ASFM for flow measurements to optimize turbine efficiency at Wells Dam. Douglas County, PUD’s single frame, 30-path ASFM Advantage was used. The full turbine measurement program is planned to start this summer. Wells Dam has 10 large Kaplan turbines with very short intakes.

ASL AQFlow will be attending the following trade shows & conferences. We would welcome the opportunity to talk to you.

ASL AQFlow Presenting:

1) Applying CFD analysis to predicting ASFM bias in low head intakes with difficult hydraulic conditions.
2) Comparison of discharge measurement by current meter and Acoustic Scintillation methods at La Grande-1.

1) The ASFM Monitor: a cost-effective tool for real-time measurement of turbine discharge.
2) Understanding causes for systematic error in ASFM measurements of turbine discharge.

Abstract submitted: Cost-effective turbine flow measurement in short intakes.
A three dimensional numerical analysis has been carried for the La Grande 1 power plant intake. The study was aimed at testing the accuracy of the numerical simulation against the current meter measurements made by Hydro-Québec’s engineers. Figures 1 and 2 show the topology of the intake. Various geometric configurations and inlet flow conditions have been studied. The first test was for the original design of the intake. In the second test, because the upstream floor may have been modified over the years by sediment/debris deposits, two other configurations have been tested as well. The third test was conducted by varying the approach flow at the inlet. The distribution of flow variables such as the horizontal velocity is shown is Figure 3. A quantitative comparison with current meter measurements is shown in Figure 4.

**Figures 1 and 2:** La Grande 1 intake and trash rack.

**Figure 3:** Mean horizontal velocity distribution at a middle section of the intake.

**Figure 4:** Comparison of the horizontal velocity with the current meter data for different geometrical configurations.

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**Other Hydro Solutions**

Our parent company, ASL Environmental Sciences, offers a range of related services and products for other hydro applications, such as flow surveys and numerical simulations in forebays and tailraces.

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