

Sheldon Smith MES., P.Geo.

Senior Hydrologist

Ecological Flows – Subject Matter Expertise

Sheldon Smith is a Senior Hydrologist and Principal with Stantec Consulting Ltd a member of the Ontario Waterpower Association.

Ecological Flow Expertise Overview

Sheldon has conducted extensive work in the field of ecological flows required to preserve fish and aquatic community health in relation to development. Sheldon has utilized many various ecological flow assessment techniques to the development of ecological flows from simplistic net water loss proportions to complex assessment techniques integrating ecological, societal and industrial water taking requirements. Sheldon has developed ecological flows for projects in the waterpower, mining, pulp and paper, rail transport, highway and upstream and downstream oil and gas sectors. Sheldon was the lead author to development of the OWA's Best Management Practices Guide for Ecological Flows and Waterpower.

Waterpower Expertise

Sheldon has worked on numerous waterpower retrofit and development projects throughout North America. Sheldon has worked on hydroelectric developments throughout North America as a hydrological, hydrogeological and geotechnical instrumentation specialist. Sheldon assisted clients in instrumentation of flow and water level measurement, telemetry and control systems. Sheldon has led waterpower project retrofits repairing dam structural deficiencies, designing new water control infrastructure such as flashboard, sluice gates, spillways and power canals and tail races. Sheldon has also assisted waterpower clients with water taking permitting and development of alternatives to address ecological flow sensitivities due to effects on significant fish habitat and communities.

Waterpower and Ecological Flow Experience

Best Management Practices Guide to Ecological Flows and Waterpower, Ontario Waterpower Association, Peterborough, ON

Project management and lead author in the development of the 2014 BMP Guide for the OWA in partnership with the Department of Fisheries and Oceans, and the Ministry of Natural Resources. The Guide was developed through consultation with the waterpower community and interested parties to ecological flows via a stakeholder survey and facilitated stakeholder workshop. From that consultative base, the Guide was developed through several iterations with the partner steering committee.

Pinkerton Dam Retrofit Pinkerton, ON

Project management and hydrotechnical lead for retrofit of the Pinkerton hydroelectric generation facility located on the Teeswater River. Specific tasks included:

- *Engineering structural assessment and remedial design of concrete dam cracks and new concrete dam wingwalls;*
- *Engineering geotechnical assessment of adjacent earthen headpond and power canal dams and design alterations including toe buttressing to address geotechnical deficiencies;*
- *New innovative design of a breakaway flashboard system that would release under higher hydraulic loads associated with high flow events facilitating higher flows in the bypass channel*
- *Design of new hydraulic sluice gate structure;*
- *Completion of dam breach assessment*
- *Assessment of ecological flows and hydrotechnical flooding effects;*
- *Permitting consultation and submission under the Lake and Rivers Improvement Act with the Ministry of Natural Resources*

Hydroelectric Facility Water Taking Permitting Domtar Espanola Paper Plant and associated Hydroelectric Development Facility, Espanola, ON

Permit to Take Water renewals of for Domtar's hydroelectric water diversions through the power plant including increase in water taking. Tasks included:

- *Hydrotechnical assessment of daily taking and request for increase based on flow meter overestimate of previous takings;*
- *Repeated water taking renewal permitting since 2007;*

- *Assessment of water diversion effects on regionally significant walleye spawning area at the base of the penstock*
- *Regulatory consultation with the Ministry of Natural Resources and Ministry of Environment regarding water taking permitting and resolution to concerns with hydroelectric water taking/diversion effects on the walleye spawning zone*

Low Flow, Fish Passage and Environmental Flow Hydraulic Assessment, LP Corp Paper Plant, East River, Nova Scotia

Development of maintenance flows (ecological flows) for the East River as part of Water taking permit renewal for the pulp and paper facility. Use of the wetted perimeter method to assess ecological flows and hydraulic modeling of the lower reach of the East River. to assess low flow water levels, fish passage and headpond weir redesign in association with water takings at Louisiana Pacific East River Mill. Consultation with NS Department Environment and federal Department of Fisheries and Oceans regarding study design and subsequent facility water taking permitting.

Ecological Flow Assessments

Ecological flow assessments for more than 120 Ontario, Quebec and Atlantic Canada watercourses and projects including:

Waterpower

- *Pinkerton and Espanola generating facilities*

Oil and Gas

- *Shell Sarnia Manufacturing Center;*
- *More than 30 product transmission pipeline watercourse depth of cover assessments including remedial designs, and hydrotechnical assessment including ecological flow assessments;*

Mining

- *Hydrotechnical and ecological flow assessments at 10 mine developments in Ontario and Atlantic Canada;*

Transportation

- *Hydrotechnical and ecological flow assessment for new and expanded railroad watercrossings at approximately 80 locations in Ontario, Quebec, New Brunswick and Nova Scotia*

Dam Break Hazard Assessments, Various Sites

Dam break hazard assessments were conducted for the Meadow Lake Dam, Isaacs Harbour, NS, the Brant Mill Dam, Oakland, ON, Pinkerton Dam, Pinkerton, ON. Tailings and Polishing Pond dams for Ontario Graphite, Kearney, ON, Wesdome Eagle River Gold Mine, Wawa, ON. Tailings dams at abandoned mine sites in Newfoundland. In addition, repair and rehabilitation works permitting and approval process was completed for many of the above assessed dams.