

BOARDMAN RIVER ENGINEERING AND FEASIBILITY STUDY

WORK ORDER

For

IDENTIFICATION OF ISSUES ASSOCIATED WITH BOARDMAN POND DRAWDOWN

22 March 2007

Background

With the recent surrender of the Federal Energy Regulatory Commission (FERC) license, operation of the Boardman Dam is now the responsibility of Grand Traverse County, the owner, and the regulatory responsibility now rests with the Michigan Department of Environmental Quality (DEQ).

Boardman Dam does not meet the Michigan statutory requirement for safety, and DEQ has directed that the water level of Boardman Pond be lowered 17 feet. As a result of the drawdown, a portion of the bottomlands under Boardman Pond will be exposed. A legal opinion has been rendered that the bottomlands are titled in Grand Traverse County.

The Boardman River Dams Committee (BRDC) is undertaking an Engineering and Feasibility Study to evaluate future options for the Boardman River System, including the possible removal of the existing impoundments. Environmental Consulting and Technology, Inc. (ECT) has been chosen as the engineering and environmental consultant to perform the feasibility study. A detailed scope of work for the feasibility study has been approved by the BRDC.

The Scope of Work (SOW) provided for a full evaluation of alternatives based upon environmental, engineering, economic, and societal impacts.

The 17 foot drawdown of Boardman Pond will not eliminate any of the future alternatives that could be evaluated as part of the feasibility study. However, with respect to the remaining impoundments on the Boardman River and the remaining Boardman Pond impoundment, the drawdown will:

- Serve as a demonstration project of possible alternatives and their impacts;
- Increase community awareness of alternatives that may be considered;

- Require an effective and proactive public information and communication process; and
- Provide for public safety during and following drawdown process

Expected Physical Impacts of Drawdown

A 17 foot drawdown in water surface will expose about 40 acres of bottomlands: a) approximately fifty feet of land will be exposed along 5,000 feet of relatively steep natural slopes around the perimeter of the pond, totaling about 6 acres; b) three areas of moderate slope will be exposed totaling about 14 acres; and c) the largest area to be exposed will be a flat, 20-acre area at the upstream end of the existing pond.

The Boardman River Channel will be extended downstream of the present upper limit of the Pond by about 1,000-feet as the pond retreats as a result of the water surface lowering. The river channel will be re-established in this area, principally through erosion.

Drawdown Issues to be considered as Part of Drawdown Management Plan

The plan for the drawdown of Boardman Pond under these circumstances should have the following main objectives:

- Minimize damage to the ecosystem during, and as a result of the drawdown;
- Provide for the safety of the public, and for private and public property;
- Optimize revegetation of exposed wetlands to provide stability for exposed lands and establishment of viable habitats; and

Scope of Work to be performed by ECT

ECT will provide professional engineering and environmental services to assist the BRDC and Grand Traverse County in the development of a plan to manage the drawdown of Boardman Pond as required by the State of Michigan. The ECT team will accomplish the following tasks:

1. Review the recently completed bathymetry; prepare a map showing where bottomlands will be exposed Develop a plan for the evaluation of slope stability considering induced groundwater movement resulting from the drawdown and any upslope structural development. Identify those areas where slope stability should be addressed in more detail.

2. Prepare conceptual revegetation options, and cost estimates, for the exposed bottomlands. Options will include natural colonization; natural seeded or planted; maintained seeded and planted; or various combinations. This task will also address management of exotics.
3. Prepare conceptual options to manage down cutting of new river channel; to stabilize new river channel; to stabilize 20-acre area of relatively flat bottomlands; and to stabilize exposed slopes. Costs of options and expected impact on sediment production and habitat impacts will be developed.
4. Sample deposited sediment of upstream end of Boardman Pond to determine physical and chemical properties.
5. Develop a plan to monitor the drawdown as it occurs, documenting observed shoreline, exposed structures, erosion, etc; and obtaining photo and survey documentation. The Plan will also evaluate and make recommendations as to the advisability of reducing the water surface levels of Brown Bridge and Sabin impoundments for additional system operational safety.
6. Document a comparison of anticipated bottomland issues with actual exposed bottomland conditions.

Budget

The work itemized above will be performed with a budget of \$20,000.

Delivery Schedule

ECT recognizes that time is of the essence for this work, accordingly, each work element will be coordinated with the BRDC and Grand Traverse County as it is completed. All work will be completed within six weeks of approval of this work order.

