

## Update to Hydropower Feasibility Study

### Executive Summary

The Essex Partnership (Essex) completed a detailed due diligence investigation of the four Boyce Hydropower projects in October 2019 that determined continued operation of the hydroelectric facilities would be marginally economic if, and only if, the capital expenditures required to bring the dams into compliance with current dam safety criteria were excluded from the economic analysis.

The May 2020 flood damaged the powerhouse structures, hydrogenating equipment and resulted in the termination of the above market Power Purchase Agreement (PPA) with Consumers Energy. The additional costs to repair the flood damage combined with the 42% low energy rates in the Midcontinent Independent System Operator (MISO) market make restoration of hydropower uneconomic at this time.

Further, restoration of hydropower would require rebuilding the four dams under FERC jurisdiction. The time required to form Boards of Consultants (B.O.C.) and multiple B.O.C. and FERC reviews would extend the construction schedule by one or more years. Four Lakes Task Force (FLTF) elected not to transfer the existing three licenses from Boyce, and not to redevelop hydropower at Edenville in order to focus efforts on restoring the dams and lakes as soon as possible.

FLTF has not ruled out reevaluating the feasibility of restoring hydroelectric generation in the future after the dams are rebuilt and when energy rates increase sufficiently to make hydropower economic.

### Condition Assessment

After the May 2020 flood, GEI and Spicer Group, Incorporated (SGI), performed visual inspections of the powerhouses and found minor damage to the Secord, Smallwood and Edenville powerhouse structures and indications of more extensive damage to the Sanford powerhouse structure. A detailed dewatered inspection of the hydropower generating equipment was not performed. Essex performed a visual inspection of the equipment in October 2020 which found extensive damage to the electrical equipment. Essex concluded that restoring hydropower would require replacing all the electrical equipment that was damaged by the flooding, overhauling all the turbines and generators and installing new interconnections to Consumers Energy.

Insufficient information was available to prepare detailed cost estimates to restore the hydropower generating equipment. For planning purposes, we estimate the cost to restore the hydropower generating equipment to be in the range of \$1.5 million to \$3 million. The 2019 Essex due diligence investigation estimated the cost of the new interconnections would be approximately \$1 million.

### FERC Licensing

The three remaining licenses (Secord, Smallwood and Sanford) expire in 2028. Relicensing these three projects is estimated to cost \$400,000, or more. Edenville does not have a FERC license. Preparing a new license application for Edenville concurrently with relicensing the above three projects would cost in excess of \$200,000. The licensing-relicensing process typically takes five to seven years and would formally start in 2023. Work would begin in 2022 preparing the Preliminary Application Document (PAD), performing informal agency consultations and developing a licensing strategy. License applications would be filed in 2028.

Depending on the complexity of the project and the environmental issues involved, it can take anywhere from one to two years, or more, for FERC to issue a new license. A new license order can contain conditions that require additional capital expenditures and/or impose operating conditions that reduce energy production.

### Economics

Essex performed a qualitative economic analysis in 2019 that estimated earnings before interest, taxes, depreciation, and amortization (EBITDA) margin of approximately \$1.6 million. The analysis assumed an “all-in” energy value of \$72/megawatt-hour (MWh). With the termination of the PPA with Consumers Energy, the hydropower projects would participate in the MISO market where prices are substantially lower. Assuming the restored hydroelectric facilities would produce the same amount of energy as pre-flood conditions and assuming an “all-in” energy value of \$38/MWh in the MISO market, the estimated EBITDA margins are tabulated below.

*Table 1. Estimated EBITDA margins by dam*

<b>Project</b>	<b>Installed Capacity (kW)</b>	<b>Estimated Production (MWh)</b>	<b>% of Total</b>	<b>Gross Revenues \$</b>	<b>Routine O&amp;M \$</b>	<b>EBITDA Margin \$</b>
Secord	1,200	4,000	13%	152,000	80,000	72,000
Smallwood	1,200	2,650	9%	100,700	53,000	47,700
Edenville	4,800	15,625	51%	593,750	312,500	281,250
Sandford	3,300	8,260	27%	313,880	165,200	148,680
<b>Totals</b>	<b>10,500</b>	<b>30,535</b>	<b>100%</b>	<b>1,160,330</b>	<b>610,700</b>	<b>549,630</b>

Under the assumed current MISO market conditions, the four hydroelectric facilities would have an EBITDA margin of approximately \$0.6 million, \$1 million lower than pre-flood conditions. This analysis does not consider the capital expenditures that would be required to repair the powerhouse structures or restore the hydropower generating equipment, the cost of the licensing process or the economic impact of any new license conditions.