

Antrim County Operator of Dams
P.O. Box 217, Bellaire, MI 49615

Mr. Ed Boetcher
Chair, Antrim County Board of Commissioners
Bellaire, Michigan

August 17, 2020

Dear Commissioner Boetcher,

Please accept the following Annual Report of the Drain Commissioner and Operator of Dams for 2019.

Annual Report of the Antrim County Operator of Dams for 2019

a) Elk Rapids Hydroelectric Facility

The County share of electrical generation revenues in 2019 was \$18,572 (10% of total sales of \$185,720), a slight decrease from \$19,357 in 2018. The continuing decrease is due to the high water level on Lake Michigan. High levels on Lake Michigan reduce the head of the dam, which reduces the amount of energy generated by the flow of water through the turbines.

Bill Stockhausen explained the situation in this May 26, 2019 email last year: “As I mentioned in an earlier email, in the next two months we will see standing water covering the full walkway behind the powerhouse (the fishermen will simply wear boots). Maybe it will even set a new record high. Compared to the almost record lows back in 2008 – 2009 when we could pull 340kW out of each generator, now we can only pull a max of 140kW. We have been able to keep annual generation about the same because we’ve been able to operate in a regime of better turbine efficiency at closer to constant full gate instead of having to run at part loads. But we are now at a point of running 24/7 both units at full gate (but with drastically reduced output) and not being able to use all the water for generation and having to spill some amounts resulting in measurably reduced generation. We have been down an average of about 20% each month for the last 6 months – our best months of the whole year. So, bottom line, the high Lake Michigan levels are and will be hurting us.”

The Stockhausens’ 5 ½ year long effort to lobby the Michigan Legislature and the Michigan Public Services Commission on gaining fair rates for electricity sales to Consumers Energy finally paid off. In December 2019, they signed a contract that lasts 20 years and provides fair rates. (The MPSC finally signed off on the agreement in early 2020.) The agreement sets up a healthy market to provide Stockhausens and the County with reliable revenues at the facility. Now we just need some lower Lake Michigan levels and we’ll be in excellent shape: maximum allowable generation and a fair price for our power.

During a routine inspection of the roof late last winter, the Stockhausens discovered a tear in the roofing membrane. Antrim County had the tear repaired, but it was clear that the roofing had exceeded its useful lifespan. At the same time, Stockhausens reminded us of the need for a roof hatch to safely access the roof of the building. The roof replacement and roof hatch installation were approved as a 2020 Capital Investment Project. As of this writing, the project has been bid out under budget and approved. We expect completion by early fall of 2020.

The Dams Department and the Stockhausens jointly held an Open House at the Elk Rapids Hydroelectric Dam in June of 2019. The event was an overwhelming success. From 10 am to 6 pm, we hosted over 700 people that received a presentation and toured the facility (while in operation). While one of us gave the presentation, two others conducted tours and the powerhouse was busy all day long. Elk Rapids Harbor staffers were also on hand to answer questions. We intend to hold a similar event when the COVID crisis has passed.

Speaking of COVID, the pandemic has had little direct effect on the Dams Department. We have had a few delays, but all the scheduled projects of the department have moved forward

without serious interruption. Of course, power generation and lake level control are deemed critical infrastructure activities.

b) Intermediate Lake Dam in Bellaire

Last year Intermediate Lake reached its peak elevation of 2019 in mid April at 608.15 above sea level—several inches lower than the highest elevation of 2018 (608.7) in the previous May. Dam operation had no impact on these levels as the gates were wide open before and during both events.

Despite the fact that the highest level of Intermediate Lake in 2019 was 5.5 metric inches lower than the maximum in 2018, once again the lakes further up the Chain, especially Ellsworth Lake, Lake St. Clair and Six Mile Lake reached flood stage, again overtopping the road crossing at Ellsworth. During this time—as is always true during threats of high water—all the gates of the Intermediate Dam were wide open. The continued high Upper Chain lake levels even when Intermediate Lake is at lower levels suggests that other factors, such as the culverts at Ellsworth or silting in the connecting rivers is playing a major role in the upstream lakes on the Antrim Chain. Nevertheless, more study is needed to identify exactly where blockages occur.

The Dams Department continues to make progress on careful study of the lake level dynamics of the Antrim Chain of Lakes. After the County committed to a Letter of Intent with the Army Corps of Engineers (USACE) in late 2018 the process of developing a hydrological model of the Antrim Chain accelerated. In July, The USACE agreed to assist Antrim County in completing the hydrology study and building the software model under its Flood Plain Management Services (FPMS) Program. After further negotiation, the Corps waived the maximum project expenditure (\$100,000) for FPMS and offered to contribute \$287,000 of services toward the project, contingent on Antrim County contributing supplementary survey work and parallel field measurements. The BOC approved \$77,375 toward the County share of the project in September of 2019.

Bids for the County share of the project were awarded this year, under budget, and the project is on schedule as USACE completed its portion of the river surveys in October of 2019. The model should be completed in 2021.

While the news of the USACE project was exciting, discussions continued with stakeholders about local initiatives that could be accomplished during the study period. After several meetings and discussions, the Intermediate Lake Association, through its Lake Level Committee, proposed some adjustments to the Bellaire Dam operation protocol. The protocols were adopted by the BOC in September 2019 as follows:

- During the summer when controlling at 607.15 feet, the lower lake level action point will be 607.00 feet. This means that the lake level will be allowed to drop to 607.00 feet before action is taken to raise the lake level by reducing water flow over the dam at Bellaire.
- As part of the process to draw the lake level down to the winter level of 606.54 feet by November 1, the lower lake level action point will be 606.84 feet from Labor Day to September 30 and will be 606.54 from October 1 to October 30.
- During the winter when controlling at 606.54 feet, the lower lake level action point will remain 606.54 feet.
- As an aid to boat usage by residents of the Intermediate River upstream of the Bellaire Dam, the Operator of Dams may decrease the flow through the Bellaire Dam for certain coordinated periods (like a weekend) to ensure there is adequate water in the river.

We continue to assess the practical impact of the new protocol in 2020 and will recommend adjustments as necessary.

During the summer of 2019, the Lake Level Committee conducted the first methodical comprehensive measurement of the Antrim Chain lake levels. Site gauges were installed by engineer Fred Sittel at the waterfront homes of volunteers on Torch Lake, Clam Lake, Lake

Bellaire, Intermediate River, Intermediate Lake, Wilson Lake, Ellsworth Lake, St. Clair Lake and Six Mile Lake. Lake levels were recorded daily by the volunteers from April through October. Although the data is provisional, for the first time we can see the relative behavior of the lake levels in real time relation to each other and weather events. I applaud the volunteers for their coordination and commitment to accuracy.

In December of 2019, the County purchased ten electronic depth loggers to replace the site gauges at volunteer's homes. Fred Sittel designed and built stilling wells for the loggers and then installed them on Torch Lake, Clam Lake, Lake Bellaire, Intermediate River, Benway Lake, Ellsworth Lake, St. Clair Lake, and Six Mile Lake. One logger is installed on land to track barometric pressure for the correction of data once it's compiled. The loggers were deployed early in 2020 and will provide an even more detailed picture of the lake level dynamics. In addition to the loggers, we have also installed 5 rain gauges at the logger sites to track the amount of precipitation. These measurements will greatly aid in ongoing testing and calibration of the hydrological model.

2019 Was another very active year of public engagement for the Dams Department. The coordination with volunteers and the management of a major hydrology study requires many more meetings and discussions over and above the routine workload of the job. Nevertheless, due to the outstanding outreach and public relations program of Intermediate Lake Association, especially by Dave Christian and Janet Hickman, the co-chairs of the Lake Level Committee, more and more residents are calling the ILA members first with their questions and concerns. Their efforts result in a much higher quality dialogue about the challenges we face in managing water levels. Their recruitment of volunteers for the measurement programs not only saves money, but also empowers residents by giving them a stake in the solutions. For this the County should be thankful to the Committee and ILA.

Late in 2019, the County hired a part-time assistant operator of dams. His name is Scott Kleinhuizen and he is a veteran hydroelectric dam operator and mechanic that worked for decades in the Washington State tributaries of the Columbia River. Scott happened to retire in our community and dropped by the ER Hydro Dam out of curiosity. Having Scott on staff will allow the County to internally perform repairs and upgrades to the Bellaire Dam and will save the County considerable money over the long term. Now that Scott is on board, we are making progress on much needed upgrades to the controls at the Bellaire Dam.

Annual Report of the Antrim County Drain Commissioner for 2019

The sole County Drain under the Drain Commissioner's authority is the outlet from Birch Lake in Elk Rapids Township that drains into Grand Traverse Bay. Nevertheless, the Drain Commissioner fields many calls about drainage issues of Antrim County residents and attempts to steer them to the proper resources to address their problems.

Respectively submitted,



Mark Stone
Antrim County Operator of Dams
Antrim County Drain Commissioner