

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

Mr. Michael Crawford
Chair, Antrim County Board of Commissioners
Bellaire, Michigan

February 12, 2015

Dear Mr. Crawford,

Please accept the following Annual Report of the Drain Commissioner and Operator of Dams for 2014.

Annual Report of the Antrim County Operator of Dams for 2014

a) Elk Rapids Hydroelectric Facility

By January 1st of this year, Antrim County was to have been granted our new license to operate the hydroelectric dam from the Federal Energy Regulatory Commission (FERC). Unfortunately, we are still awaiting the Environmental Assessment (EA) from FERC, which is the final step in the process. FERC staff reassures me that the EA will be forthcoming and we will have the license by late spring. In the meantime, we can operate the facility as normal.

A FERC engineer from the compliance department inspected the facility in August. Gary Sutter and I hosted him during the inspection. The follow up report approved of our facility as being in full compliance and meeting all safety standards.

The Stockhausen family (Elk Rapids Hydroelectric Power LLC) reports satisfaction with the operation at the Elk Rapids Dam. Several improvements to the equipment were made in 2014, such as an electrical brake system for the turbine shaft. Lake Michigan water levels have rebounded to the point that the choke boards on the draft tubes could be removed. A permanent mounting system is now in place if they are ever needed in the future. Bill and Stock continue to actively engage with the local community and often welcome visitors into the dam for tours. Public response to the new building sign has been uniformly positive. (I estimate that the cost of the sign would have been over \$20,000 installed—Stockhausens donated all the design, time and materials for the project.) They are also eager for the County to complete the dam renovation project over the next couple of years.

High water has caused a good deal of consternation in the Antrim Chain, but one positive side effect is the outstanding electrical generation in 2014. The County netted \$29,478.57 in generating revenues as a 10% royalty on almost \$300,000 gross revenues. Though it's roughly a 150% increase over the 2013 revenues, it's not an increase based entirely on water volume. For much of 2013 and part of 2014, one of two generators was down for repair. That broken gearbox probably cost the operation more than \$100,000 in electricity sales over the period of 2012–2013.

b) Intermediate Lake Dam in Bellaire

2014 proved to be yet another eventful year with regard to the Intermediate Lake water level. Nevertheless, thanks to a turn in the weather, we avoided setting a new record high. At the end of last winter, accumulated snow was abundant in the uplands of the Antrim Chain watershed and the frozen ground was saturated. Lake levels were already higher than normal due to higher groundwater discharge as a carryover from heavy precipitation in 2013. The stage was set for an exceptional flood. In early April the thaw began and lake levels began to spike. On April 17th,

Intermediate Lake rose to a high of 608.93 feet above sea level (21.36 inches above the legal level). Amazingly, the peak of the thaw fell right during an unusual dry spell for April, and the absence of rain allowed the level to subside. By the next rainfall, the levels had come down enough to avoid additional flooding. In other words, we had dodged a bullet.

To understand the unusual significance of last spring's events, consider the following comparison. During the spring of 2013, the high April level (608.38) that caused so much alarm, was actually lower than the level in April of 2014 (608.93). However, the April 2013 level was high due to rain on top of melt, while the April 2014 was even higher—but with little rain on top of melt. You may recall that in November of 2013 we had an even higher lake level (608.82), than the April 2013 level. The November level was caused entirely by rain, with no melt waters at all. So, if we had received any substantial rain in mid to late April of 2014, it could have been a very high water level. To date, we still have not exceeded, or even matched, the all time recorded high water level of 609.55, logged on April 6, 1963.

It's important to note that, since Intermediate Lake is the only lake on the Upper Chain that is managed with a legally prescribed level, it's also the only lake level on the Upper Chain that is monitored and recorded. Although the other lakes on the Upper Chain are all part of the same watercourse as Intermediate Lake and they are closely connected, in actuality the other lake levels probably peak at different times and for somewhat different reasons than Intermediate Lake.

As of today, the accumulated snow load on the lands within the watershed are significantly lower than 2013. Although the frozen ground is still substantially saturated with moisture and we are at higher than normal winter lake levels, we are better positioned than 2014 to avoid widespread spring flooding. However, heavy spring rains could completely alter the scenario.

The stainless steel sheeting installed during the 2013 construction project on the Bellaire Dam is performing exactly as planned and protecting the concrete structure from the scouring effect of the accelerated water entering the chutes.

In August, the easternmost radial gate began to operate erratically and, upon inspection, the gearbox was found to be internally corroded. In September, the gearbox was removed and sent to ConeDrive of Traverse City to be refurbished. It was found to be in good operating condition, but with normal internal corrosion for a unit of its age (the gearbox has been in service since 1974). In November, the gearbox was reinstalled after being refurbished.

c) Miscellaneous Duties

As many of the commissioners are aware, a very important part of my job is educating the public about water levels, the dam operations and fielding complaints. 2014 brought another heavy load of inquiries, especially about lake levels, but not just on Intermediate Lake. The call volume from Lake Bellaire, Clam Lake and Torch Lake increased significantly this last year. Since we don't have actual measurements for these other lakes I can only speculate, but I suspect that we may have hit higher levels on these lakes than in 2013.

In service of the goal of public education, in 2013 I created a new presentation titled "The Dam Facts: Water Levels in the Antrim Chain of Lakes." The presentation was delivered twice last year, including to a large gathering of riparians in Thurston Park sponsored by the Intermediate Lake Association and Grass River Natural Area.

In August, I led a tour for Tip of the Mitt Watershed Council on Grass River to explain the Large Woody Debris Project (LWD) and answer questions about the Antrim Chain.

Responding to a complaint from a resident on Birch Lake, in December I inspected the drainage ditch that serves as the outlet of Birch Lake in Elk Rapids Township. (Note that Birch Lake is the only legally established drainage district in Antrim County.) The culverts under the Timberlake Drive crossing were clogged with leaves and backing up the drainage of Birch Lake.

Closer inspection discovered that the culverts have collapsed under the road bed and caused subsidence of the road bed. The Antrim County Road Commission arranged to have the immediate clogging cleared and has agreed to address the culvert and road problem as early as possible in 2015.

d) Related Activities

The Operator of Dams also participated with a workgroup formed to address issues related to the 100-year floodplain designations around the Antrim Chain of Lakes. In 2015, I will be in charge of implementing the group's recommendation to install a few survey monuments and lake level sight gauges on the major lakes in the Antrim Chain. The monuments and gauges will allow homeowners and contractors to identify where the boundary of the 100-year floodplain falls on their property. This will help to avoid the unfortunate results of building too close to the lake level—only to discover too late that their home is at risk of damage or non-compliant with construction codes. A monument will also allow us to measure the actual level of a lake on a routine basis—especially during high water events.

We also expect the DEQ to issue a permit to build up to 8 new large woody debris (LWD) structures in Grass River. The existing structures were installed in 2013. Transect measurements taken a year later in 2014 indicate that the structures are moving sediment and deepening the channel as predicted. The LWD structures have also proven to be excellent habitat for juvenile sport fish species and sped up the natural rate of bank stabilization. Funds remaining from the 2013 project will be used to complete the new structures.

Annual Report of the Antrim County Drain Commissioner for 2014

The Drain Commissioner had no activity during the year of 2014, with the exception of the matter of the Birch Lake drainage ditch described above.

Respectively submitted,

A handwritten signature in black ink, appearing to read "Mark Stone". The signature is written in a cursive style with a large, stylized initial "M".

Mark Stone
Antrim County Operator of Dams
Antrim County Drain Commissioner