

# The Burden Lake Dam System:

1831 - 2024

by Larry McKeough

in conjunction with The Burden Lake Preservation Corporation



**Disclaimer:**

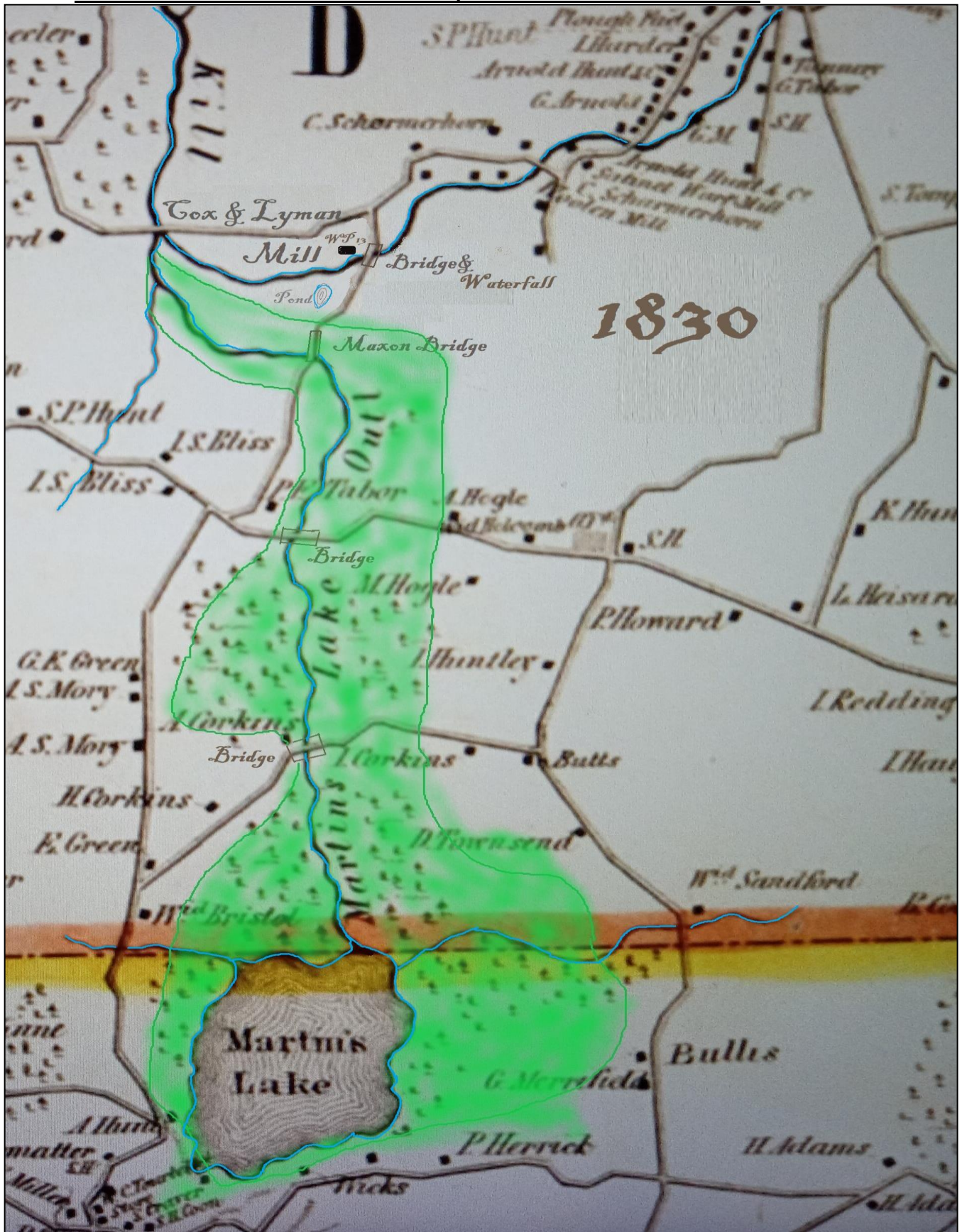
**This booklet is our best representation of the current Dam System based upon many hours of research. The location of the 1831 Dam is not known with 100% certainty. Based on the research, and documents available to us at this time, we believe the location, and all the information presented, to be accurate.**

**Larry McKeough**

**Many of the original documents shown in this booklet plus many more reside in a locked fireproof file cabinet in the BLCA Club House.**

**The information in this booklet was assembled in January 2024 by Wayne Pratt and Larry McKeough of the Burden Lake Preservation Corporation.**

Welcome to 1830 in Sand Lake NY., now called Averill Park NY.



If you look at this map from around 1830, you'll see Martin's Lake at the bottom in the Town of Nassau surrounded by a green valley which extends to the north.



Martin's Lake had an outlet stream sometimes referred to as Flat Rock Creek, which flowed north through a green valley and eventually met the Wynants Kill Creek where it crosses under present day Garner Road. This is what it might have looked like in 1830.



Flat Rock Creek



The green valley

Close up of map.



Maxon's Bridge spanned Flat Rock Creek on the Nassau- Sand Lake Road, now called the Burden Lake Road, County Rt 51.



Maxon's Bridge probably looked something like these bridges.

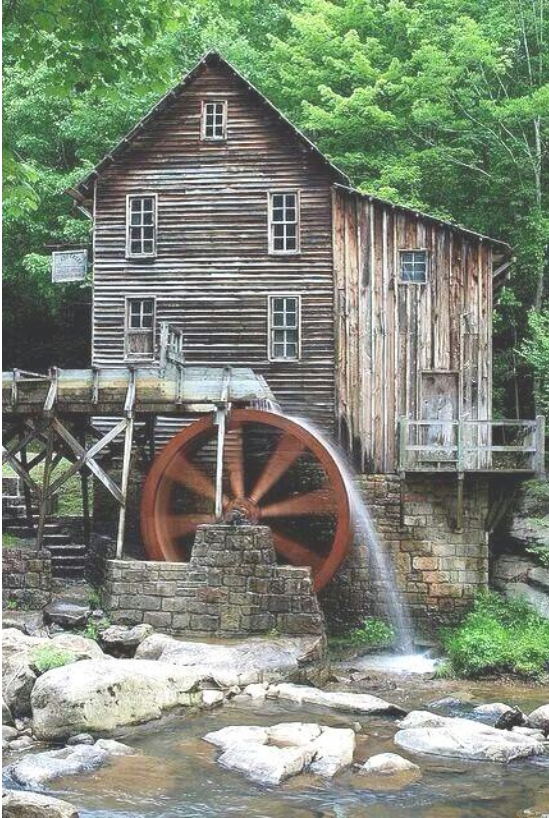




Just north of Maxon's Bridge was a pond that in 1834 became known as Carmichael's Pond because William Carmichael owned the land and the Mill near the pond.

The Patroon of the Manor (Stephen Van-Rensselaer III) leased water privilege (WP) sites along the Wynants Kill to industrious people who wanted to operate a mill powered by the water of the Kill.

Mills like these were found along the Wynants Kill Creek in Sand Lake in 1830's.



In Sand Lake there were six WP sites along the Wynants Kill. The site where present day Garner Road meets the Burden Lake Road was WP13. The remains of the foundation of that mill still exist today (2023) next to the Creek on private property.





## History of Mill Site WP13

The first mill at WP 13 was the Crannel Sawmill (1788-1794) which became the Rowley Sawmill (1795-1803) and then the Cox & Lyman Sawmill (1804-1834). Then, William Carmichael took over the mill and converted it to a Fulling and Carding Mill (1834-1845). Around 1845 the mill was purchased by John Coons and converted to a Paper Factory. In 1854 John Coons sold the mill to Staats T. Tompkins who made wrapping paper from straw. Tompkins built a dam to create a mill pond and a wooden conduit to convey the water to his mill wheel. **Tompkins is the one who granted the Wynantskill Improvement Association permission to build a diverting dam and dike system downstream from his mill, to fill the green valley creating a new water reservoir eventually known as Burden Lake.** The mill was sold in 1865 to the E. & J. Merwin co. and eventually became Andrew Smart's Paper Mill. In August of 1891, there was a huge rainstorm and flood which ruined many of the mills along the Wynants Kill. At Smart's Paper Mill, (WP 13) the bulkhead, part of their dam and the water trunk were washed out and all paper stock was lost. It appears that was the end of the mill operations at WP 13. <sup>1</sup>

Back in 1830, the Mill at WP 13 was being run as the Cox & Lyman Sawmill.



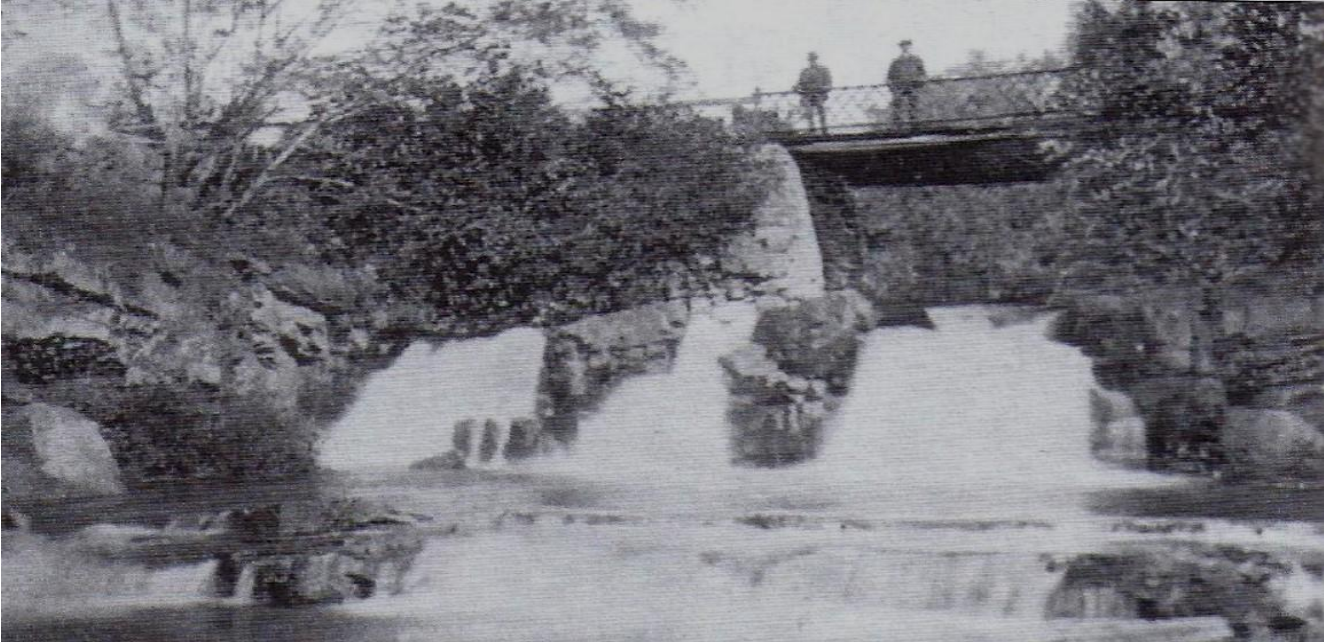
Original old photo most likely taken after the 1891 flood when the mill was severely damaged while operating as Smart's Paper Mill. (year of photo unknown)

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<sup>1</sup> From R.J. Lilly The Wynants Kill a small stream but mighty



There was another bridge over the Wynants Kill Creek just north of Maxon’s Bridge on the Nassau-Sand Lake Road which had a 20-foot-tall natural waterfall. It is still there today; you never see it because it’s directly under the current bridge which just seems like part of the road. It is just south of the intersection of Garner Road and Burden Lake Road.



Actual old photo of bridge on Burden Lake Road over waterfall just south of Garner Road. (year unknown)



2023 photo of waterfall



Two roads crossed the valley in between Martin's Lake and the Wynants Kill Creek and had small bridges that cross over Flat Rock Creek. These roads eventually became the First & Second Dyke Roads.

## 1831 Things begin to change!

In 1831 the Wynantskill Improvement Association (WIA) received permission to dam up the outlet stream of Martin's Lake and include gates to control the flow of water to the Wynantskill. It appears that the first dam they built is actually the lowest portion of the current dam we still have. This first dam is about ten feet tall and raises the level in Martin's Lake by about 18 inches and backs up the water coming down Flat Rock Creek, most likely making the water about 10' deep near the dam at the end of what we now call the First Lake. It would have taken many years for the local watershed to fill the lake to the size as shown in the map below left. This started the process of flooding the green valley and creating what we know today as Burden Lake.

They may have had to slightly raise the bridges on First & Second Dyke Roads at this time. It would appear they left Maxon's bridge intact for now.

Below, modified illustrations from: *Robert J. Lilly, in Historical Highlights, Volume 24, No. 2, Winter 1998, original artwork, courtesy of Bob Moore.*

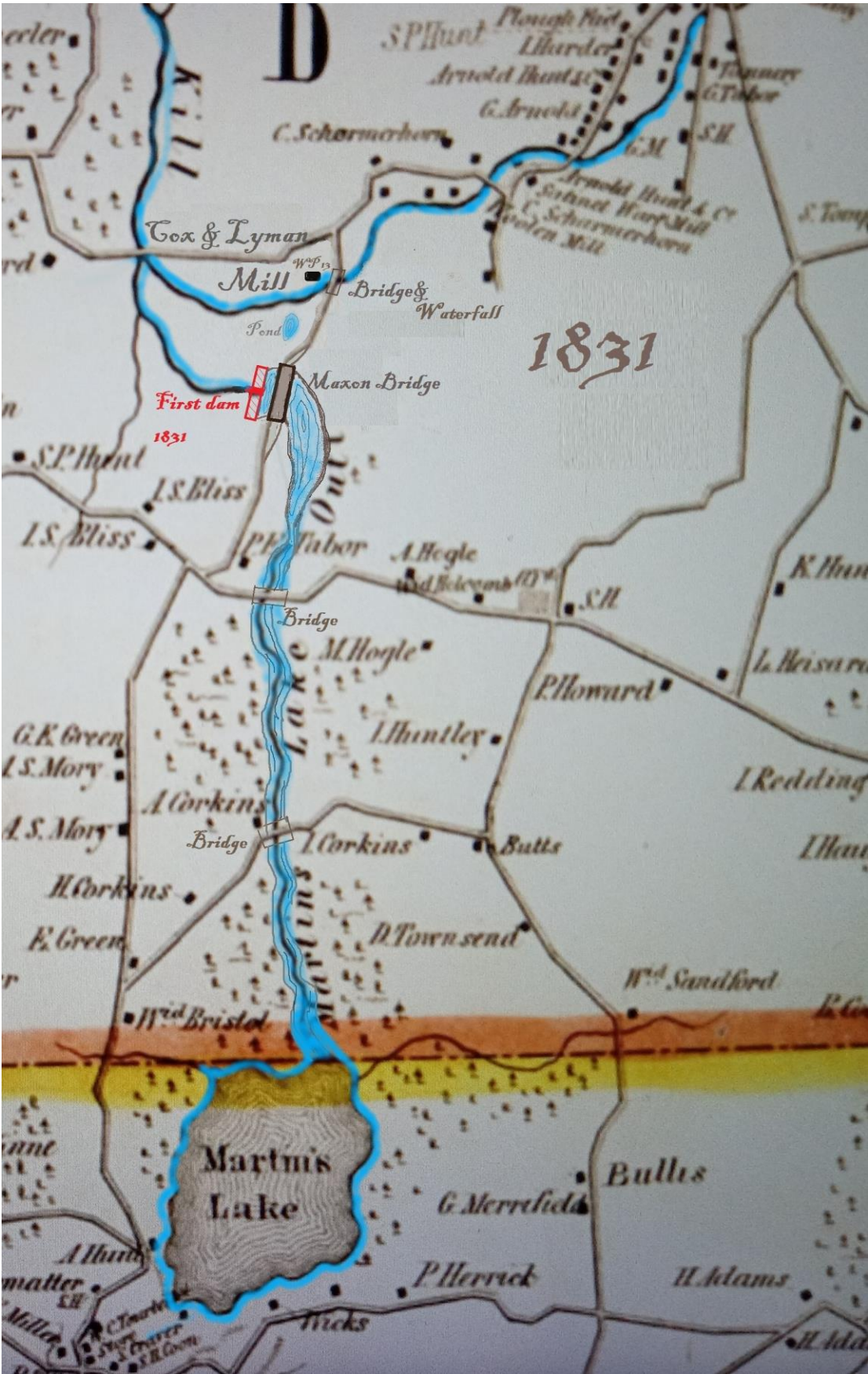


Map shows Lake only partially filled. This map must have been drawn after the 1831 dam was installed, and before 1863 dam was built.



First dam circa 1831 about 10' tall erected just west of Maxon's Bridge. This dam raised Martins Lake 18" and began to form the lake seen in the map at the left, possibly drawn about 1850. This dam remained until 1863. This is the west side of the dam built with locally cut hand stacked stone without mortar. Outlet pipe shown at bottom. The control gate would have been on the lake side.

1831 Map shows the first dam (in red) installed west of Maxon's Bridge. The valley is beginning to fill.





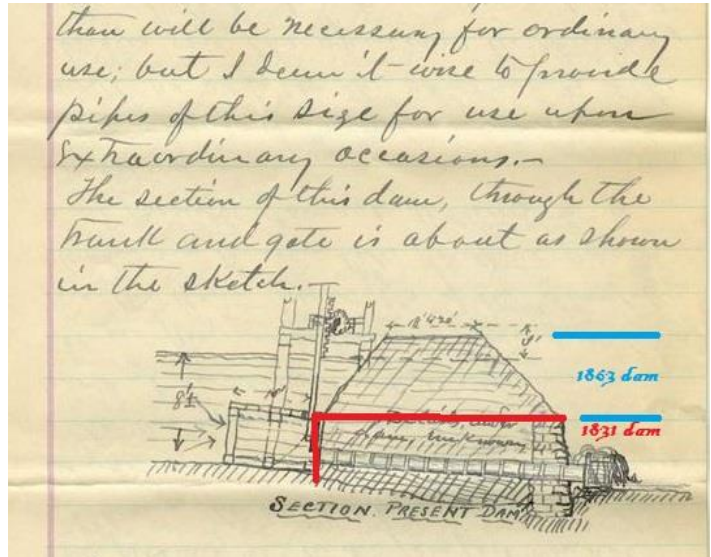
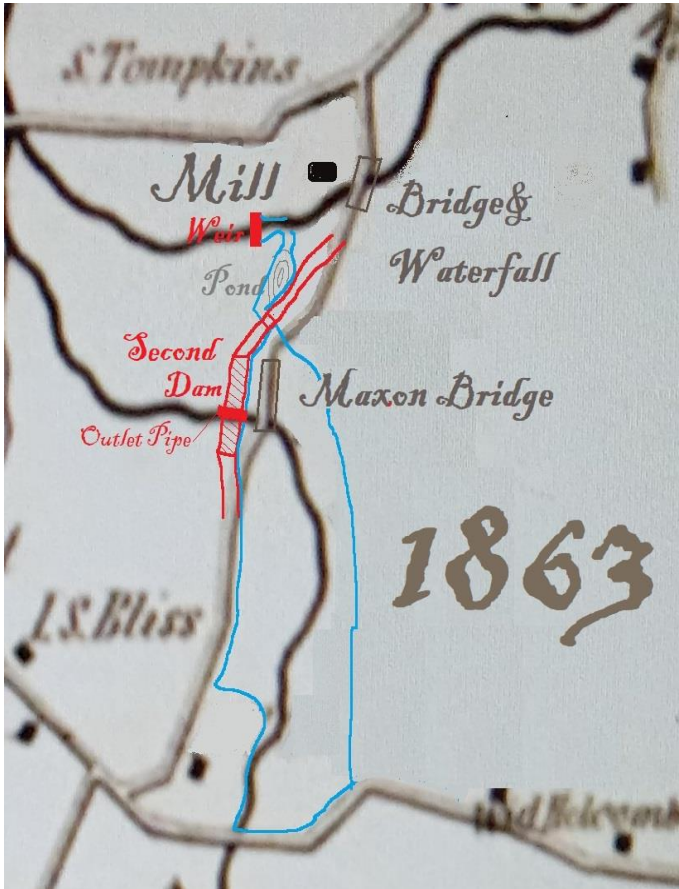
For many years, the Wynantskill Improvement Association (WIA) wanted to enlarge the 1831 dam and raise Martin's Lake another 8' (6' plus 2' to the high-water mark). The NYS Legislature approved their plans in 1846 but Van Rensselaer's ownership of the land and leases in place slowed the process. Finally in the early 1860's the Anti-Rent Wars were resolved, and the farmers who owned the land in the green valley were able and willing to sell their land to be flooded to the WIA. **They agreed on the high-water mark of the flooding and marked it with an iron pin pounded into a hole drilled in a rock on the northeast shore of what is now the First Lake. The WIA was purchasing the land to be flooded from the farmers, and that pin established the boundaries of where the WIA owned to, and is still the mark used today.**



The "PIN" still used today to establish the high water-mark set at 629.68 feet above sea level, identifies the extent of the lands now owned by the Burden Lake Preservation Corporation. This Pin is 24" higher than the "normal" level of the Lake and the capstones atop the Weir. Photos courtesy of Dennis Ryan.



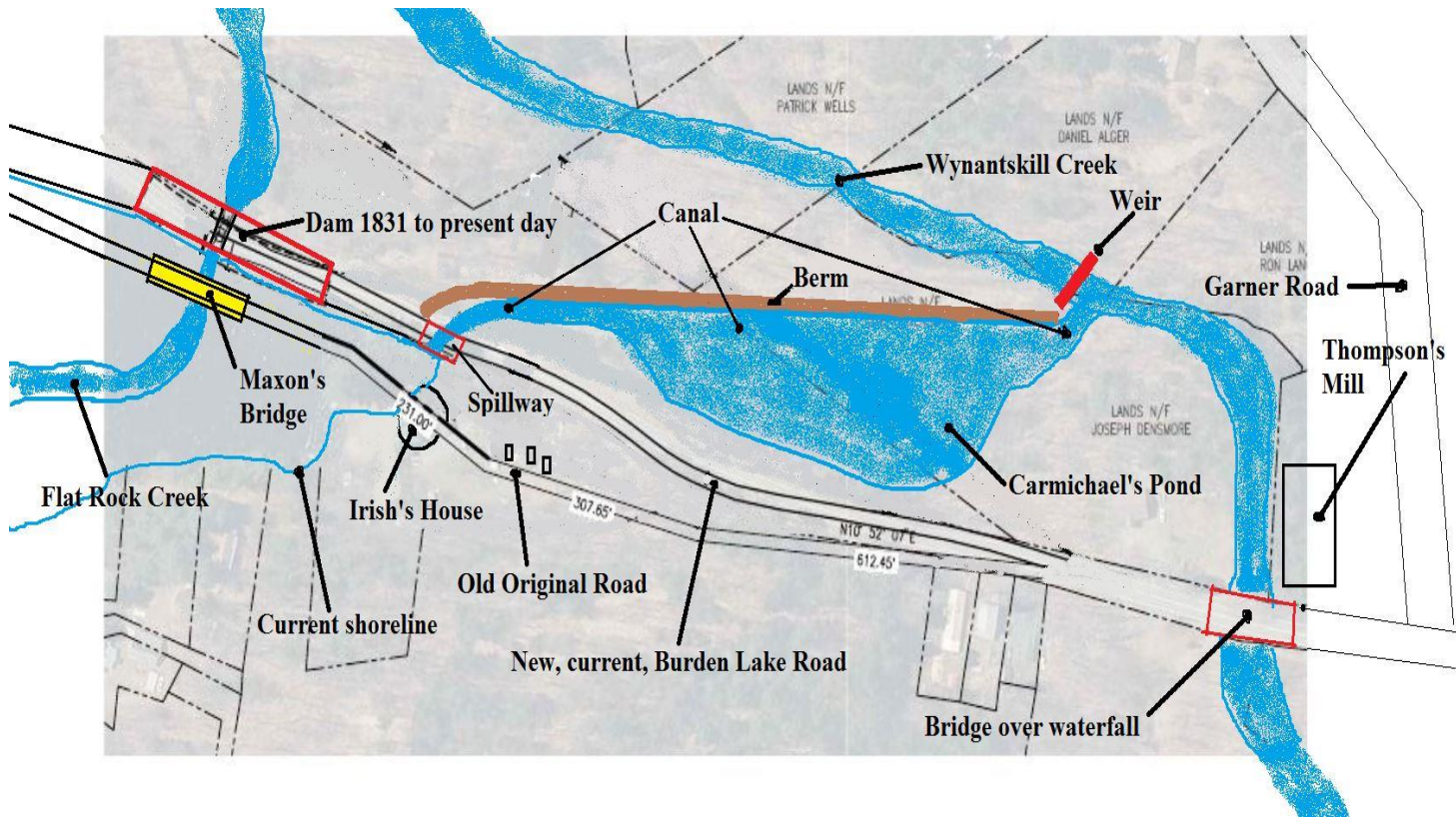
In 1861 WIA hired Burton A. Thomas to design the Dam System to create the new reservoir. Thomas knows the local watershed will never fill the reservoir another 8' so he incorporates a canal to force water from the Wynantskill into the valley. The design includes putting an 11' tall earthen dam on top of the 1831 dam, extending the north & south ends of the dam and creating a new road on top of the dam sufficient for horse & Buggy travel and removing the old Maxon's bridge. Plus installing a new gate on the outlet pipe to control the flow. Digging a canal to Carmichael's Pond and a canal from Carmichael's Pond to the Wynantskill which require a dike or berm to retain the water in the canal. Installing a diversion dam (Weir) in the Wynantskill just below Thompson's paper mill (to force the water into the canal and fill the reservoir). Also raising the two Dyke roads and bridges and installing wooden trunk pipes in the Dyke roads so the lakes could be drawn down as needed.



Drawing by David M. Green in 1889 showing the cross section of the dam as built in 1863. Red shows the 1831 dam, blue shows 1863 dam which was added to the top of the 1831 dam. David Green is recommending improvements to the dam which will follow.

Finally in 1863 construction begins. In red is the new road, raised dam and diversion dam (Weir). Canal is there in blue as is an outline of the future First Lake.





The above map shows a 1961 survey map we found of the original “old road” prior to 1863, where Maxon’s Bridge was, then we superimposed (thanks to Jim McKeough) that survey map onto a 2023 map showing where the Burden Lake Road is today. As you can see, the 1831 dam was installed just west of the old road enabling them to keep the old road open until construction of the 1863 dam was complete. We believe once the 1863 dam was complete, they disassembled Maxon’s Bridge and commenced flooding the lake. This section of the “old road” is underwater in the First Lake. In fact, the Old Road would have gone right through Irish’s House and continued right behind their rental cabins.

## 1863 – Construction of a new Dam System begins!

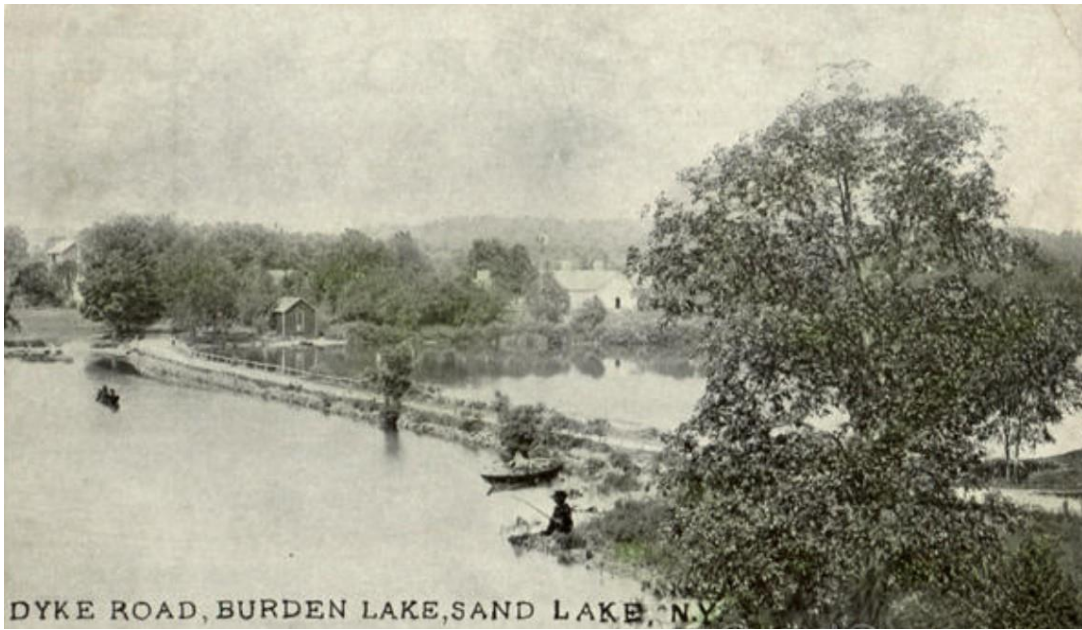
Construction of the Dam System finally begins in 1863 and is completed in 1865. Once completed, with the two Dyke roads raised, and with water coming in from the Wynantskill, it still took almost two years to fill the new reservoir to the high-water mark. After this, the Lake becomes known as Burden Lake in honor of Henry Burden who was instrumental in forming the WIA. The Dam System stays like this until 1890.



Picture shows how they moved dirt prior to the heavy motorized equipment we have today. We believe this is how they dug the canal and made the 900’ Berm along the Canal in 1863.



The following old postcards show the raised Dyke Roads. Unsure of the date, but most likely around 1880



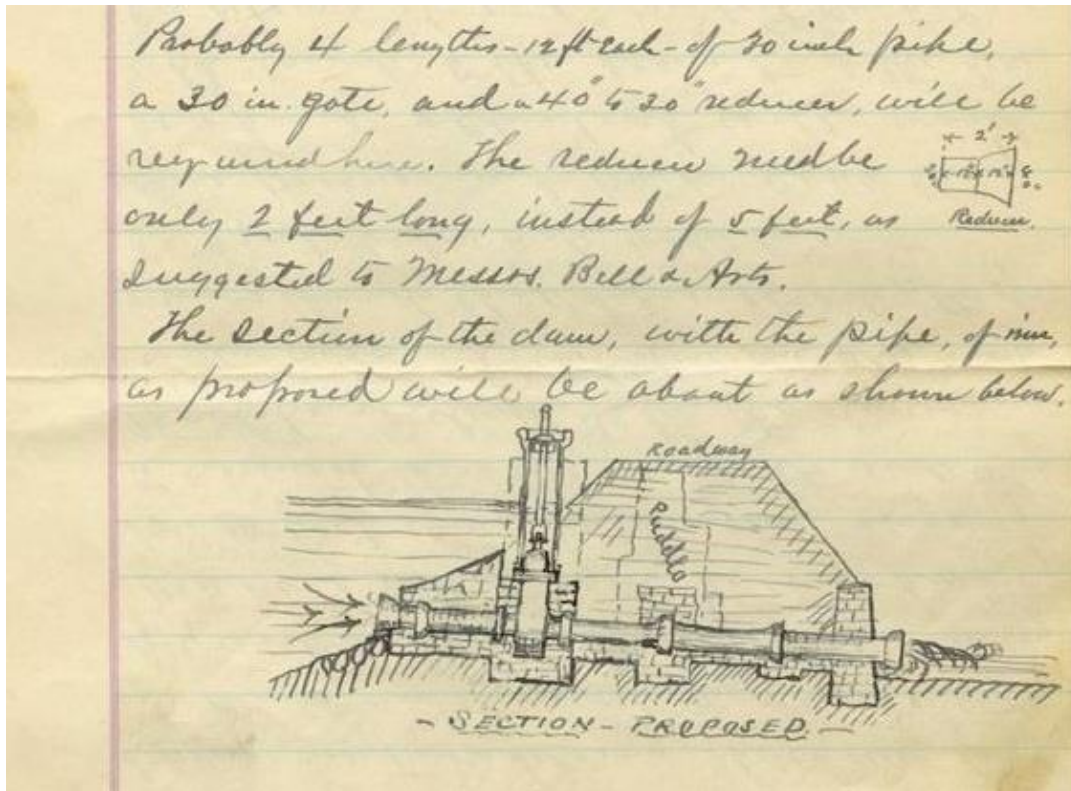
First Dyke looking West.



Second Dyke looking East. Kays would be to the left side.

## 1889 – Potential problems!

The Dam System was unchanged until after the infamous 1889 Johnstown PA. flood which killed some 2000 people. The WIA immediately hired David M. Green to assess the entire system of lakes and dams to ensure they can't have a catastrophic event like Johnstown. In July 1889, Green prepares a comprehensive 19-page report for the WIA. There are deficiencies in the system which need to be fixed ASAP. Most recommendations are implemented beginning that same year. At Burden Lake, among other things, Green recommends raising & improving the dam and replacing the wooden pipe and gate with a modern cast iron pipe and gate valve which gets installed shortly thereafter.



Green's recommendations for the Burden Lake Dam which were implemented around 1890.

1863 through the 1980's, the east or Lakeside of the dam, had a gate valve house covering the valve which looks similar to this.



Actual photo of the valve guard shack stuck in the ice.  
Photo courtesy of Mark Cioffi.



The Robert J. Lilly book has led us to what appears to have been the next chapter of the dam. In his book, The Wynants Kill: A small stream, but mighty, on page 44 states, "In 1948, the County Highway Department advised that the road upon the dam and dike at the discharge of the Burden Lakes would have to be widened to 40 feet to meet the new highway standards. After considerable negotiations among Mr. Hansen, county engineer, Town Supervisor Miller, and Faith Mills' William D. Mahoney (representing the WIA), an agreement was reached wherein the County Highway Department would broaden the dam and dike to their own requirements and use steel beams to strengthen the bridge to place it in satisfactory condition. The Town resolved to transfer the First Dyke Road to the County Highway System, and the WIA would not be liable for any expenses. Second Dyke Road was deeded to the Town of Sand Lake in 1952 to complete the transfer of the roads and bridges to Town and County supervision."

## 1948 Changes!

It is now believed that the County modified the Dam sometime in 1948 or 1949 and made substantial modifications to the 1863 dam. It sounds like they repaired the Spillway Bridge & abutments, and they widened the road and raised the east side of the road higher than the west side so they could achieve the desired width, paved it and sent the storm water and snow & ice melt down the west stone face of the dam.



Above is a modified drawing from *Robert J. Lilly article in Historical Highlights, Volume 24, No. 2, Winter 1998*---Original artwork Courtesy of Bob Moore.

The above drawing shows the lower 1831 dam with the newer stone wall on top apparently added after 1889. There is no date on the drawing, but it must be after the County widened the road atop the dam in 1948 . It also shows the railroad track guard rails on the west side of the dam, a 1948 Dodge pickup, and on the far (lake side) of the dam you can see the roof line of the gate valve guard shack which the lake Ice took out in the 80's.

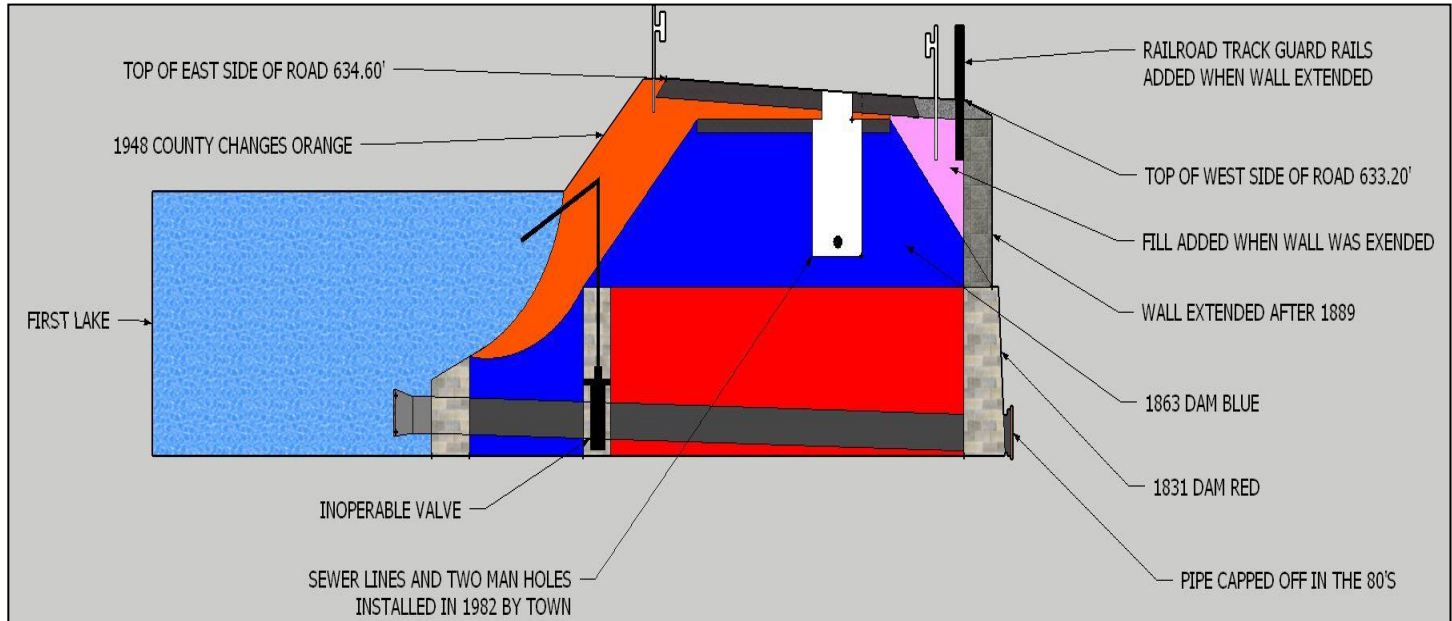
# Here is a current cross section of the dam showing the changes we believe took place.

Red = 1831 First Dam by WIA

Orange = 1948 Modifications by County

Blue = 1863 Dam added to top of 1831 Dam by WIA

White = 1982 Sewer by Town of Sand Lake



## 1982- more changes!

Then in 1982 the Town of Sand Lake dug up the dam and installed sewer lines the length of the dam at least 8' deep. There are two manholes in the road atop the dam that extend down into the structure up to 10 feet deep.





## 2009 more changes!

In about 2009, the County replaced the spillway bridge and made any necessary repairs to the abutments.

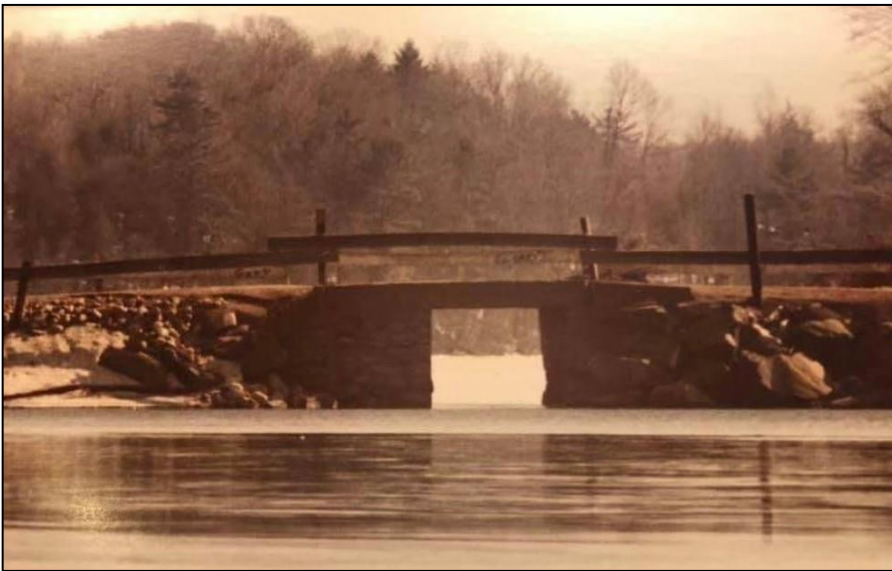


Spillway Bridge

Left- Lake side

Right- Canal side.

## Changes- Second Dyke Road



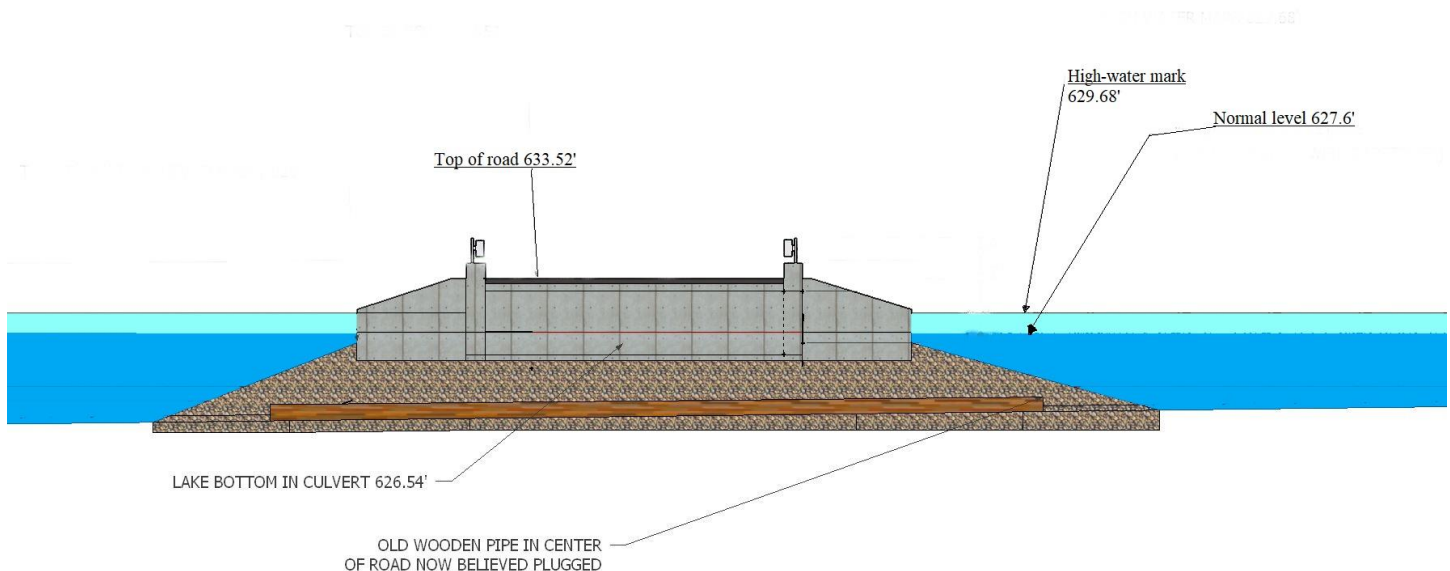
Bridge on Second Dyke Road. This structure was in place for many years. It was replaced with a 7' or 8' galvanized culvert pipe in about 1988. Photo taken from the Second Lake looking south. Photo courtesy of Vinny Robelotto. Year unknown most likely 1950's or 60's



This culvert was the passageway from the Second Lake to the Third Lake from around 1988 till 2022. Photos courtesy of Dennis Ryan.

## 2022, Second Dyke Bridge upgraded.

In 2022, the old galvanized round culvert pipe on the Second Dyke Road near Kay's, was replaced by the Town of Sand Lake with a 7' tall, 9' wide, 61' long concrete structure. See the drawing below.





## New modular precast concrete structure installed.



Photos courtesy of Walt VanDeLoo 2023

## Current conditions of the Dam System

### 2023- Improvements are now needed badly!

#### 1 The Dam

- The road on top of the dam is closed and has been for 2+ years.
- The Burden Lake Preservation Corp. (BLPC) expressed concerns with the County about the safety of dam, and the County shut down the road the same day.
- The exact condition of the dam is not known. The DEC is requiring a very costly professional Engineering Assessment to be done to help determine the current condition of the entire Dam System.

#### The BLPC does know the following about the Dam:

- The stones of the west wall appear to be moving.
- There is hole about 6' in the stone face on the west side with gravel below it.
- There are stress cracks all through the fairly new blacktop in the road atop the dam.
- The Town installed a sewer line at least 8' deep the length of the dam in 1982.
- There are 2 manholes in the dam approximately 10' deep into the structure.
- The 30" drain pipe's valve is inoperable and the west side of the pipe is capped off.
- **The dam, designed in 1863, was never designed to handle the amount of traffic and size and weight of the vehicles that were traveling over the dam prior to its closing.**





One spot where stones have moved



Close up of the 6' hole



6' Hole in face of wall. Stones left of hole appear to be collapsing.





There are many Stress cracks in the road on top of the dam



Man, next to 6' hole



More lose & moving stones





Loose stones around outlet pipe



30" pipe capped off



Sewer manhole at least 10' deep.



Road closed, guard rails and supports separated and unstable.



## 2 The Weir

- Originally built of wood which washed away in the storm of 1891 and replaced with a concrete and cut stone structure in 1892.
- The current weir is four to five feet high, four to five feet thick, and fifty to sixty feet in length. Its cut-stone abutments on either side are failing.
- Is in unbelievably bad condition. Part of the weir fell apart and was repaired with railroad ties in the 1970's and are still in place today rotting away.
- The large granite capstones, which set the "normal" level of the 3 lakes, have all been washed off the top of the Weir with sandbags taking their place, temporarily.
- The structure is leaking in numerous places including through the 1970 temporary repair.
- The boards under the Weir appear to be deteriorating.
- The Weir has reached the end of its useful life at 130+ years old.

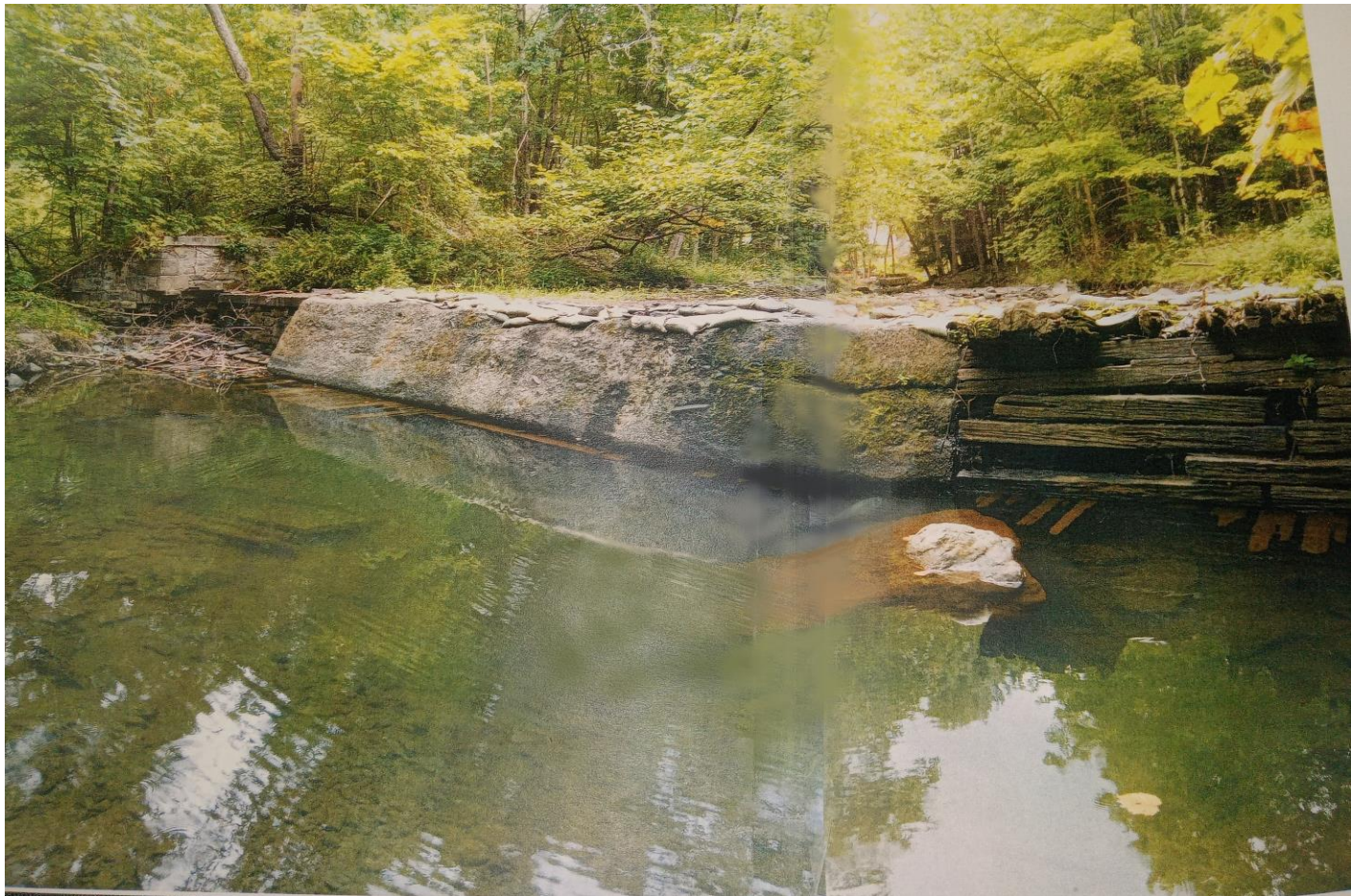


Weir photos were taken during drought of 2022 revealing the deteriorating condition of the structure including rotting boards underneath the Weir.





Above - Southeast Abutment  
Left – Northwest Abutment  
Both falling apart!







Old photo of Northwest abutment when it still had the capstones. Only one capstone remains today.



Old photo shows some of the cap stones still in place. Larry McKeough plugging a leak in the Dam (actually the Weir) with his thumb, trying to save Burden Lake! Photo courtesy of Paul Ashline.

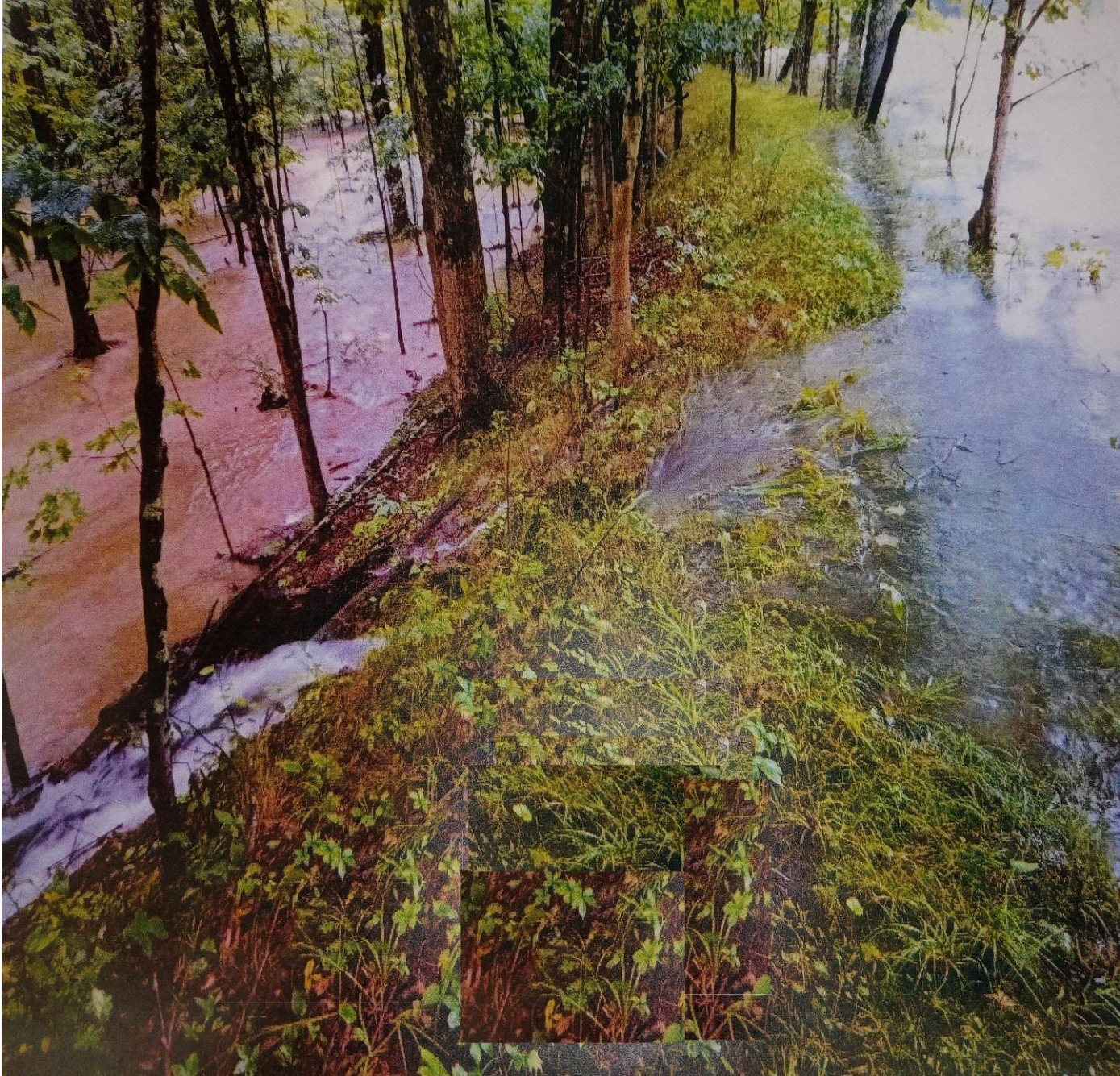


Flood of 2021 had 3 feet of water going over the top of the Weir for several days!



## The Berm

- Needs to have all the vegetation including trees removed.
- Must be raised to 632.68' above sea level (3' higher than the high-water mark) and widened sufficiently to prevent breaching during large storms and high-water events.
- Needs rip rap installed on the east side to help prevent erosion.
- Needs grass planted along the top and west side.



Canal to right, water flowing over berm into the woods. Photo during flood of 2021





Similar to previous photo. Shows even more water breaching the berm during flood of 2021





Berm after the flood, canal to right.



#### 4 The Canal

- Needs to have the foreign debris removed.
- May need to be dredged to remove the buildup of sediment.

#### 5 The Spillway

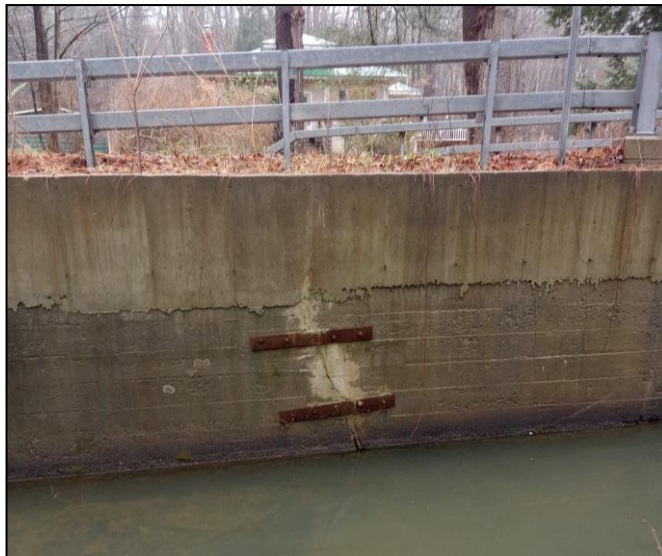
- In good condition
- Bridge replaced in 2009.
- Abutments may need some repairs.



Lake side of Spillway



Canal side of Spillway



Old repair on spillway wall



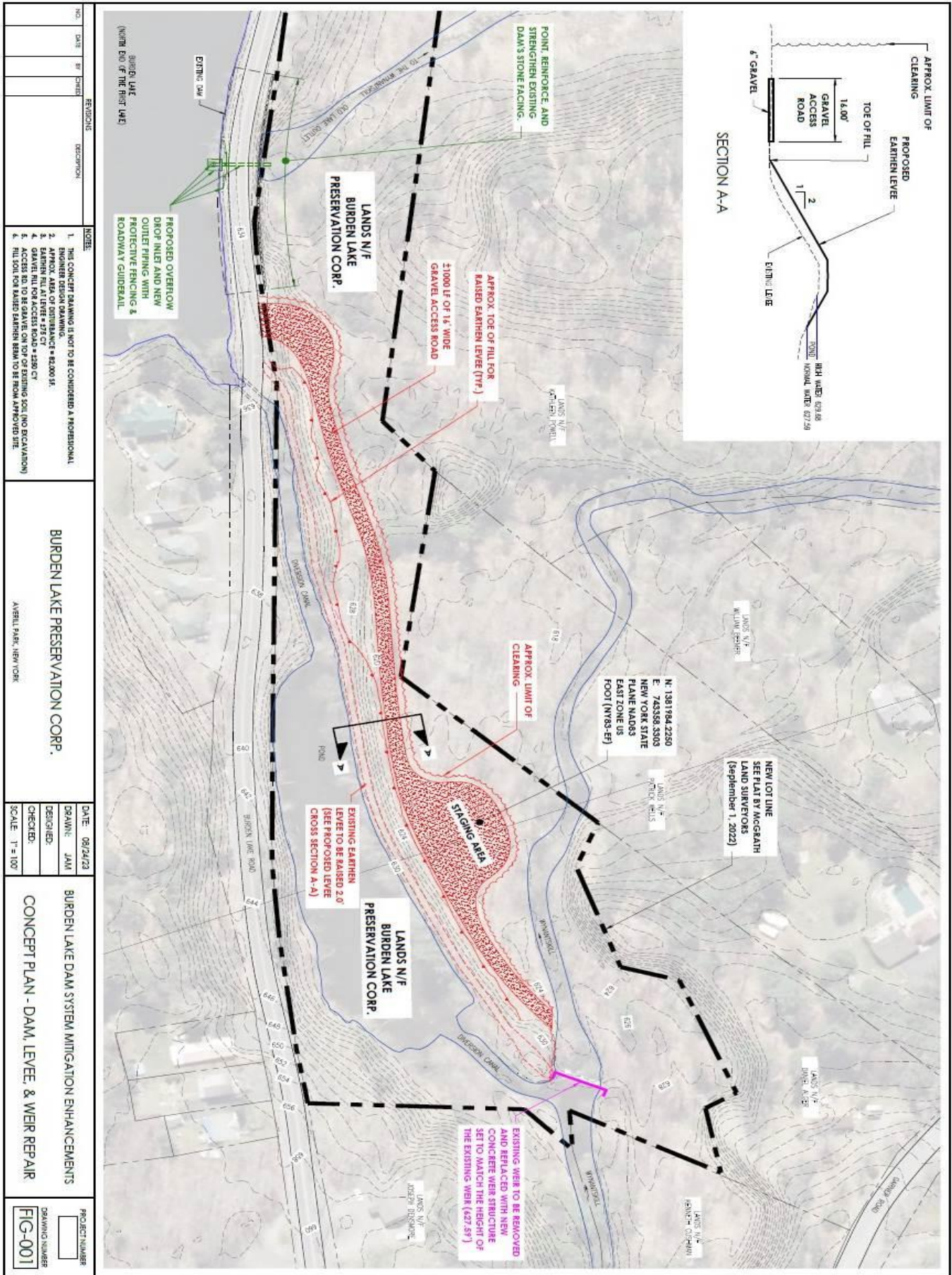
# **Current plans as of December 2023:**

- The BLPC has been looking for funding and applying for grants starting in 2021, to hopefully receive the funding needed to make the repairs.
- BLPC is currently (December 2023) waiting to see if we get a 4.2-million-dollar Hazard Mitigation grant, applied for in 2021. It still looks promising!
- BLPC is working with the DEC, the Town of Sand Lake, the County, and engineers to look for solutions and funding.
- BLPC is in the process of preparing an informational booklet for all lake front property owners advising them of the potential negative long-term effects, should something fail at the Dam System and the water drops significantly in the Lakes.

## **BLPC's concept plan for keeping the water in Burden Lake:**

1. Build a construction service road from the dam on B/L Road to the Weir
2. Completely replace the Weir with the elevation set at the exact same historic elevation, incorporating a "fish ladder," if needed
3. Remove all trees and brush from the 900-foot berm; raise the Berm to 632.68' above sea level and widen the berm sufficiently to prevent a future breach. Hydroseed the top and west side of the berm. Install riprap on the east side of berm to reduce erosion.
4. Utilize the original 30-inch exit pipe under the dam by incorporating a standpipe/repared control valve (on the lake side of the dam) to allow us to make a combination drop drain and give us the ability to release excess water as needed.
5. Repair and strengthen the west side of the dam under the closed portion of Burden Lake Road
6. Divert water and snow melt from flowing off the roadway and down the west face of the dam





Above is the BLPC's Conceptual drawing of the needed repairs.



## References

Robert J. Lilly, *The Wynantskill: a small stream but mighty*

Robert J. Lilly, *Articles from Historical Highlights*

Mary D. French & Robert J. Lilly, *Images of America, SAND LAKE*

F. W. Beers, *Rensselaer County maps (colored and or modified for illustration purposes)*

Rensselaer Historical Society, *A Resourceful People pictorial history*

Various photos from the internet

Sand Lake Historical Society *Old Post Cards, photos, maps, History of Burden Lake, and more*

David M. Green 1889 19- page *Dam Assessment for Wynantskill Improvement Association*

Hart-Cluett House Museum – *8 boxes of Wynantskill Improvement Association corporate papers*

## Researchers

Frank Maier – Research, Photos from 2021 flood

Paul Ashline – Various photos, research

Dennis Ryan – Various invaluable historic surveying maps and documents, field work, photos

Wayne Pratt – Various photos, research, documentation, guidance, details, archival of records

Jim McKeough - Mapping research, field work, technical drawings, Conceptual plans, elevation verification and documentation, bathymetry surveying and mapping and way more...

Larry McKeough – Various maps and illustrations, field work, research, photos, deed research, concept.

Read all four booklets about Burden Lake, available on your Associations Web Page.

In addition to this booklet, there are,

***The Burden Lake Preservation Corp. History***

***Elevations and Bathymetric Survey of Burden Lake***

***The Woods Development at Totem Lodge***





Tompkins Mill

Waterfall under bridge

Original road to Sand Lake  
(now Averill Park)

Maxons Bridge

Flat Rock Creek  
Outlet from Martins Lake

Small bridge over  
Flat Rock Creek

Now Kay's Famous  
Pizza

Small bridge over  
Flat Rock Creek