A wide river flows through a landscape. The water is dark and rippled. In the foreground, there are patches of green algae or moss on the riverbed. The middle ground shows a grassy bank with some reeds. The background is a dense line of trees under a grey, overcast sky.

Review of Proposed Modifications to Stoughton Dam
Town of Pleasant Springs Board
July 12, 2022

Emmons and Olivier Resources, Inc.
Steve Gaffield, PE, PhD



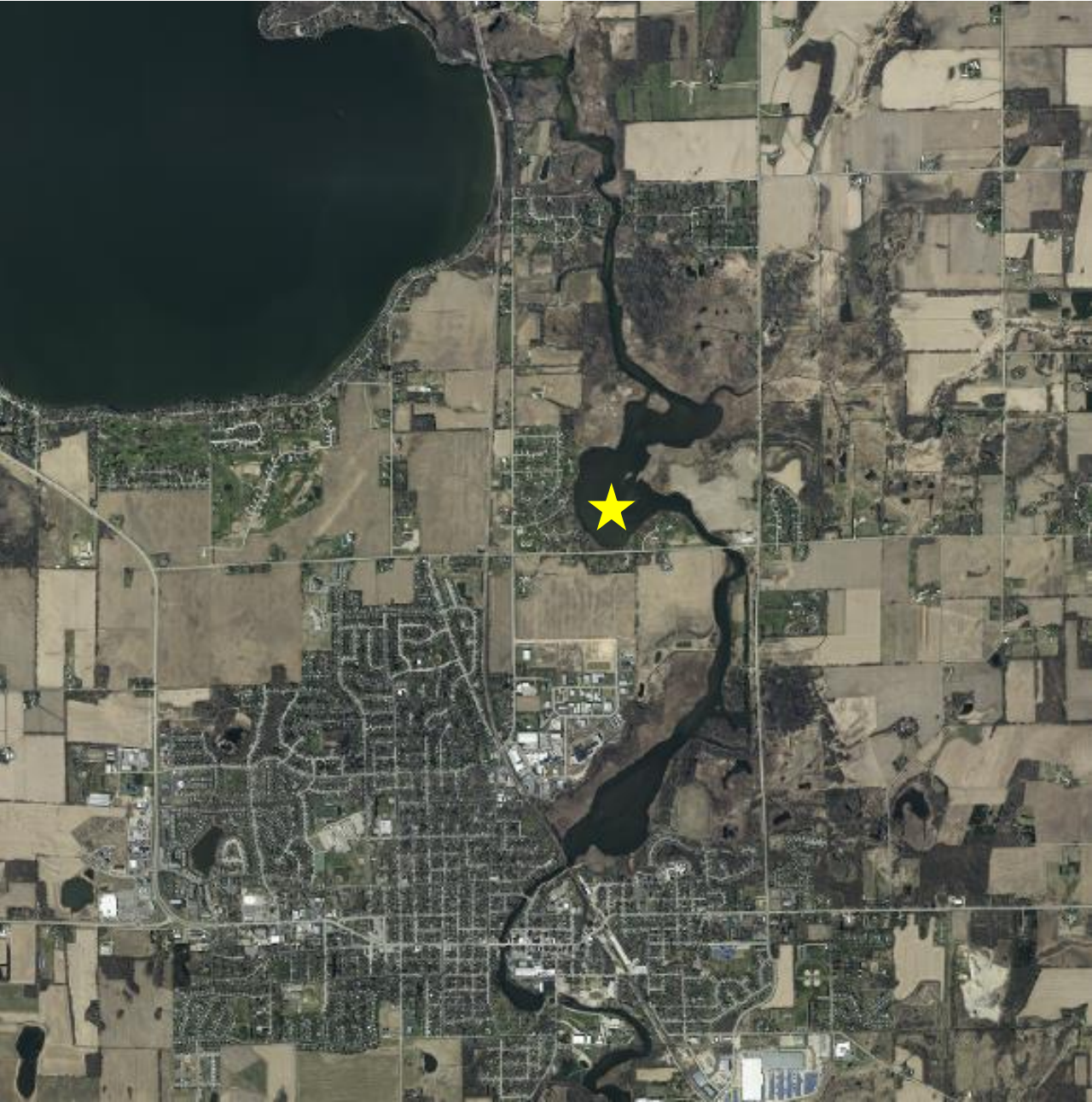
City to create whitewater park

Dam modifications

- Remove gates
- Construct fixed overflow at 836.5 ft
- Create whitewater channel

Millpond water level

- Higher than if dam removed
- Lower than existing



Widening upstream of CTH B:

Low flow (150 cfs)

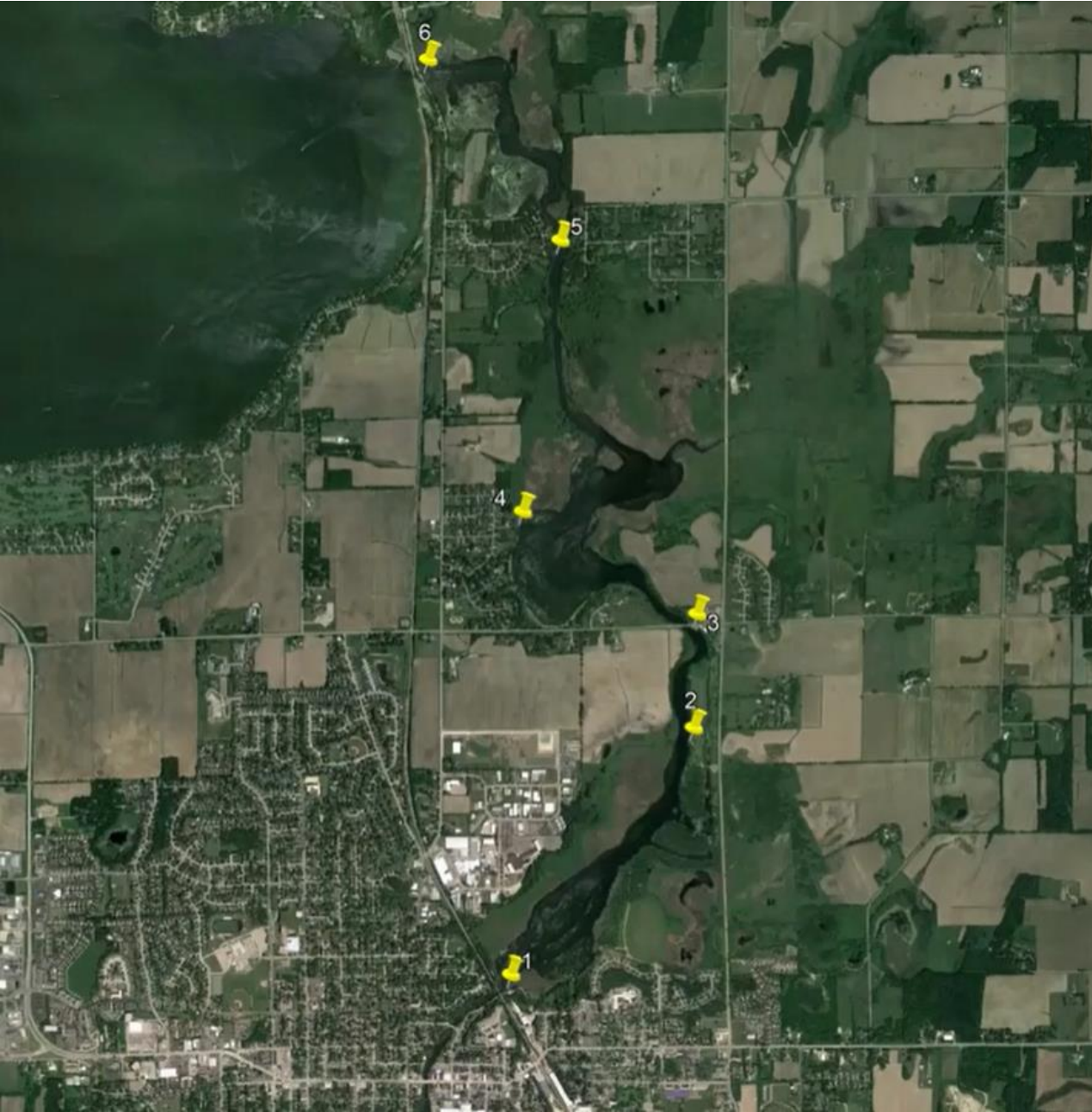
- **0.6 – 1.6 ft water level drop**
 - Lower drop is for summer vegetation
 - Higher drop is without thick veg. growth

Mid-range flow (380 cfs)

- **0.3 – 0.8 ft water level drop**

High flow (650 cfs)

- **0.1 – 0.3 ft water level drop**



Predicted water level drop is large compared to existing water depth upstream of CTH B.

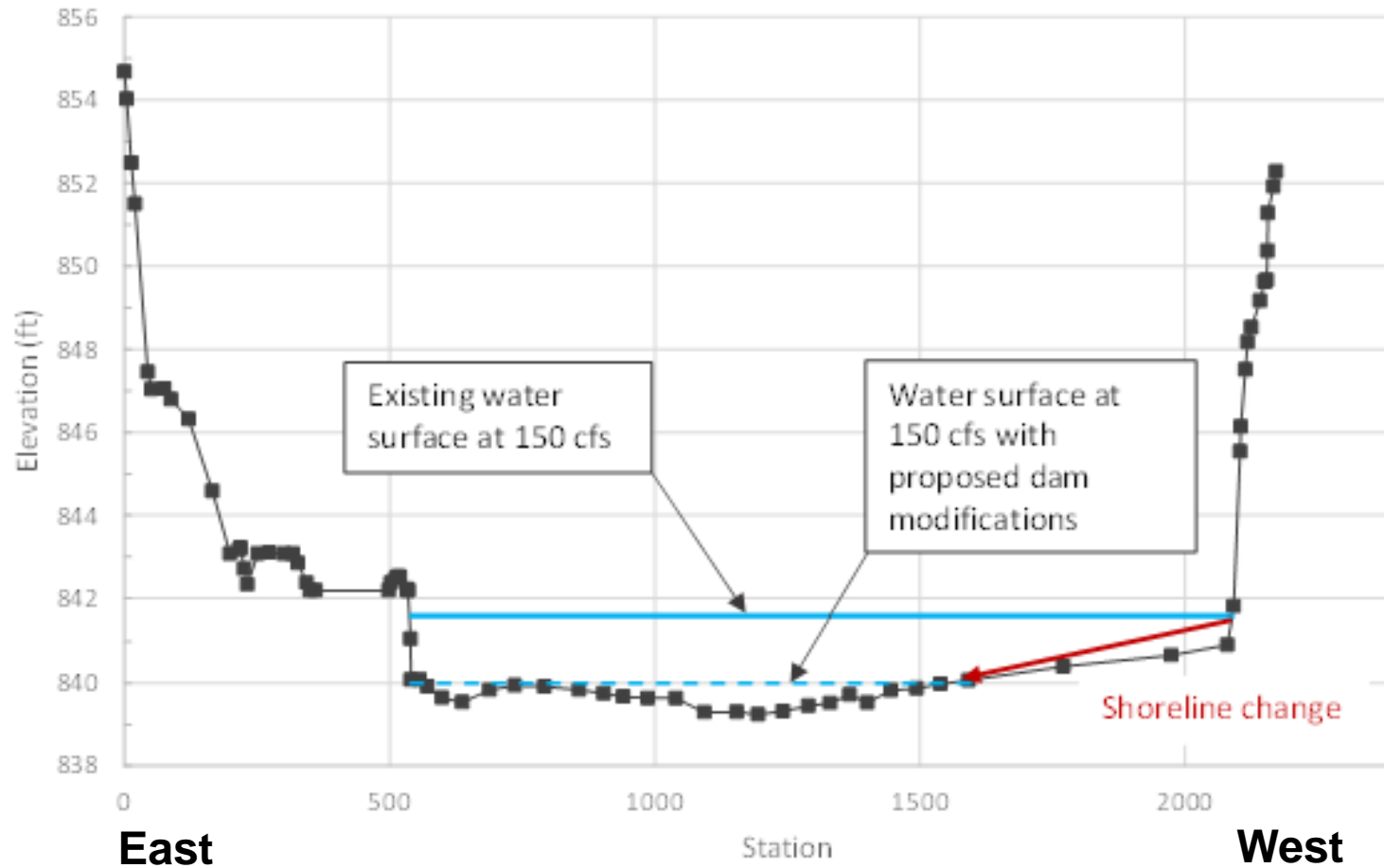
Shoreline change depends on riverbed elevation.

No new riverbed data collected.

Cannot map shoreline change without additional data.

Changes in River Channel

Only available riverbed elevation data is from Flood Insurance Study.



BEFORE THE DEPARTMENT OF NATURAL RESOURCES

13.10
3-SD-83-802

In the Matter of the Establishment of Maximum and Minimum Water Levels and a Minimum Outflow for the Stoughton Dam, City of Stoughton, Dane County. ORDER ISSUED.

FINDINGS OF FACT

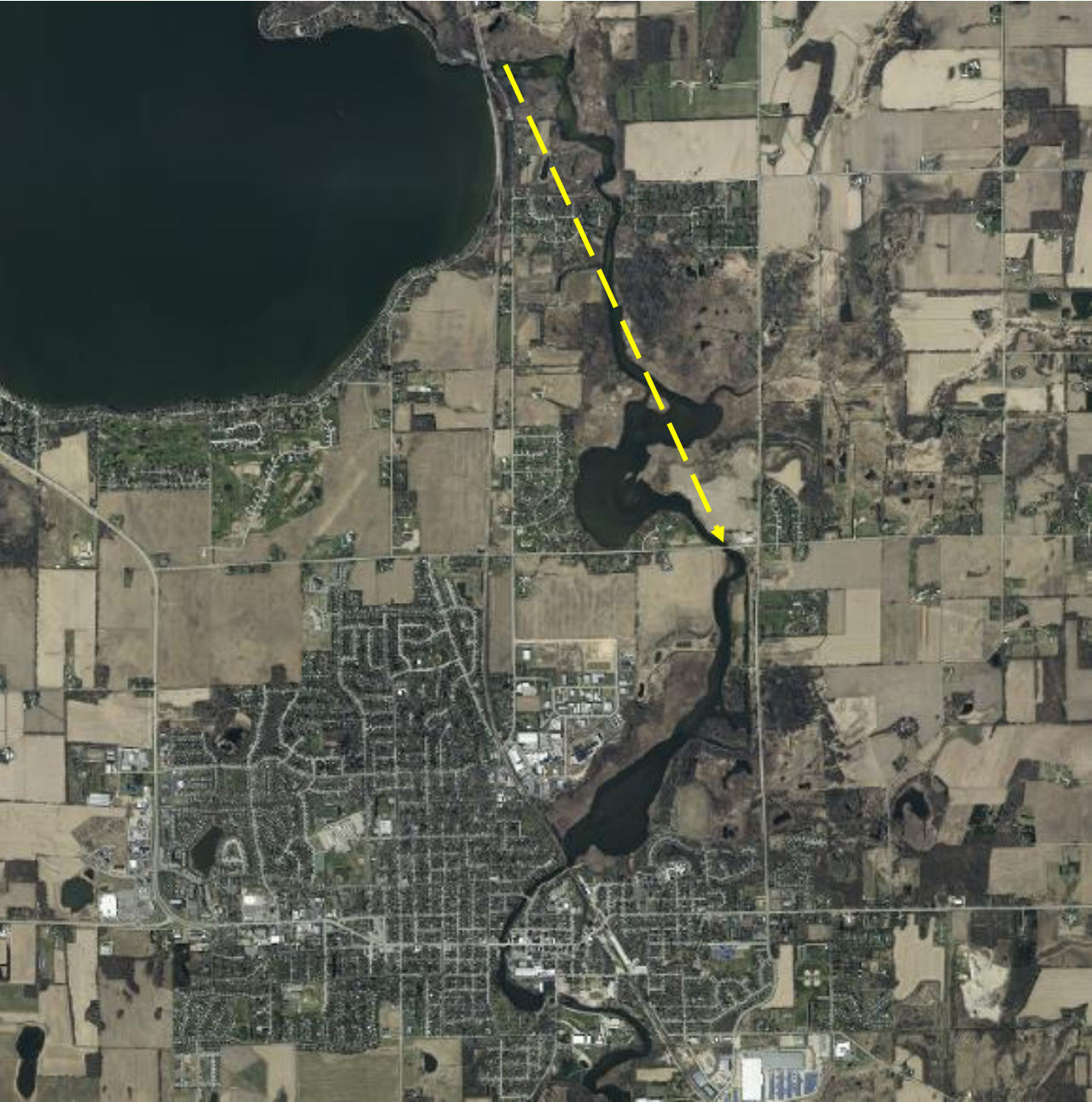
1. The Department of Natural Resources, on its own motion and pursuant to Section 31.02, Statutes, completed an investigation of water levels and the minimum outflow of the Stoughton Dam, City of Stoughton, Dane County. The Department has complied with all procedural requirements of section 31.02, Statutes.
2. The Stoughton Pond is maintained by the Stoughton Dam located on the Yahara River in the SW $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Section 8, T5N, R11E, Dane County. The dam is owned by the City of Stoughton, 381 East Main Street, Stoughton, Wisconsin 53589.
3. The Stoughton Dam is structurally capable of maintaining a maximum water level of 842.00 feet, MSL datum. There is sufficient storage capacity above this elevation to prevent excessive flooding of the shoreline or failure of the dam.
4. The ordinary high watermark of the Stoughton Pond has been determined to be at elevation 842.24 feet, MSL datum. Establishing and maintaining water levels above this elevation would infringe on private property rights.
5. To allow recreational use adjacent to the shoreline, an elevation of at least 841.00 feet, MSL datum, must be maintained during the recreational season.
6. It is desirable to keep the range of levels maintained as small as possible. Historically, levels recorded by the Department have averaged 841.93 feet and have ranged from 838.12 feet to 842.90 feet, MSL datum.
7. Water levels above 842.00 feet, MSL datum, will cause inundation of the shoreline, lead to excessive erosion and siltation from wave action and cause damage to private residential and commercial buildings upstream.

Dam operating order issued by WDNR in 1983

- Water levels below 841.00 ft will:
 - Adversely affect recreational use and aesthetics
 - Drain wetlands
 - Affect river habitat

WDNR's review of City's permit application should consider these impacts

Permit process will include a 30-day public comment period

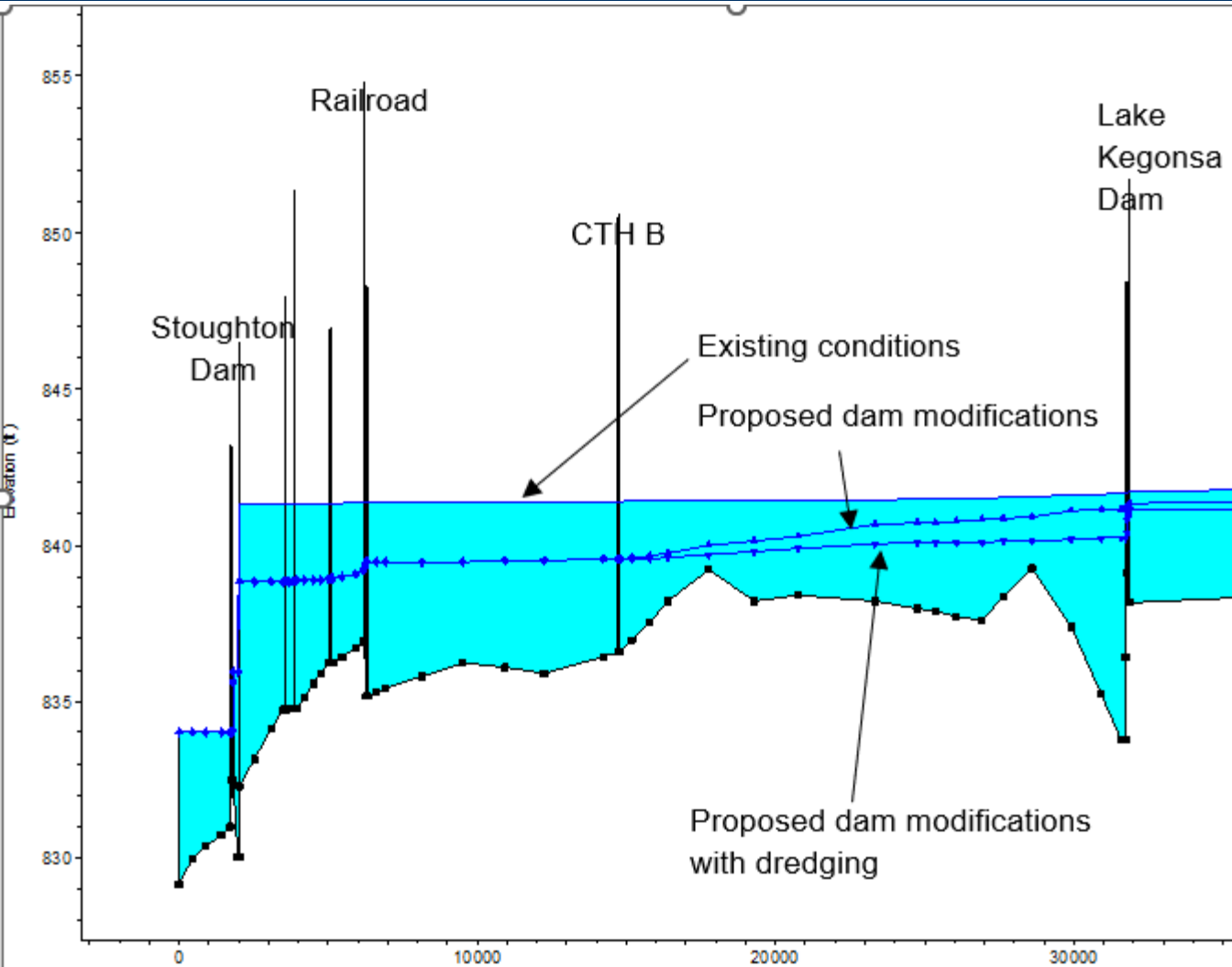


Intended to reduce flood hazards on Yahara chain of lakes.

To be completed this year.

Will cut a channel approx. 3 ft deep and 50 ft wide.

Removing sediment built up by urban development.



Hydraulic profile at 150 cfs

EOR screening analysis

- **Dredging + dam modifications will lower water levels further than dam modifications alone.**
- **Approximately an additional 0.3 ft in widening upstream of CTH B at 150 cfs.**

Dredging effect is temporary; sedimentation will continue.

Sedimentation affects local water depth as well as floodwater conveyance.



Additional data needed to define how river shoreline will change.

Could be collected by professionals or volunteers.

Need to record river flow at USGS gage and water elevation.

- **Need a surveyed reference point**
- **Muck will be a measurement challenge**
- **Which areas of interest and level of detail needed?**

Questions?

