Introduction

Mark Theisen

North Lake Management District
Environmental and Water Quality Committee Chairperson

Living on North Lake since 1993

I am going to talk about the NLMD proposed dredging project

North Lake Water Quality Concerns

- Poor water quality
- Excessive aquatic plant growth
- Algae Blooms
- Navigation access from shoreline impeded

Water Quality Metrics

- Secchi Disk – used to test water clarity
- Dissolved Oxygen – we test D.O. levels at various water depths
- Phosphorus – water samples are sent to the state lab

These metrics have been tracked on North Lake since 1986

August 2021 Water Quality Testing Results

- Secchi Disk

  5’ - Below normal - Average for August since 1986 is 8.75’

- Dissolved Oxygen (D.O.)

  D.O. declines rapidly below 15’ with temps of 75 degrees – rough on fish

- Phosphorus

  All 7 sites tested exceed the impaired waterway threshold of .015 mg/l,

  Worse near the inlets

NORTHERN LAKE SERVICE, INC.
Analytical Laboratory and Environmental Services
400 North Lake Avenue - Crandon, WI 54520
Ph: (715)-478-2777 Fax: (715)-478-3060

ANALYTICAL REPORT

WDNR Laboratory ID No. 721026460
WDATCP Laboratory Certification No. 105-330
EPA Laboratory ID No. WI00034

NLS Project: 371286
NLS Customer: 113776
Phone: 414 801 7264

Client: Terra Vigilis
Attn: Charles Luebke
N72W32225 Reddelien Road
Hartland, WI 53029

Project: North Lake

Small Lake Wildwood Pt

08102021-1E NLS ID: 1271346
COC: 0:1 Matrix: SW
Collected: 08/10/21 19:30 Received: 08/13/21

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	[0.017]	mg/L	1	0.0060	0.020	08/16/21	4500-P E-1999	721026460

Small Lake SW Basin

08102021-2E NLS ID: 1271347
COC: 0:2 Matrix: SW
Collected: 08/10/21 19:30 Received: 08/13/21

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	[0.016]	mg/L	1	0.0060	0.020	08/16/21	4500-P E-1999	721026460

Big Lake Wildwood Pt

08102021-3E NLS ID: 1271348
COC: 0:3 Matrix: SW
Collected: 08/10/21 19:30 Received: 08/13/21

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.021	mg/L	1	0.0060	0.020	08/16/21	4500-P E-1999	721026460

Small Lake N of Channel

08102021-4E NLS ID: 1271349
COC: 0:4 Matrix: SW
Collected: 08/10/21 19:30 Received: 08/13/21

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	[0.019]	mg/L	1	0.0060	0.020	08/16/21	4500-P E-1999	721026460

Big Lake Ice House Bay

08102021-5E NLS ID: 1271350
COC: 0:5 Matrix: SW
Collected: 08/10/21 19:30 Received: 08/13/21

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.026	mg/L	1	0.0060	0.020	08/16/21	4500-P E-1999	721026460

Big Lake Schneider Bay

08102021-6E NLS ID: 1271351
COC: 0:6 Matrix: SW
Collected: 08/10/21 19:30 Received: 08/13/21

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.023	mg/L	1	0.0060	0.020	08/16/21	4500-P E-1999	721026460

Big Lake Deep Hole Bay

08102021-7E NLS ID: 1271352
COC: 0:7 Matrix: SW
Collected: 08/10/21 19:30 Received: 08/13/21

Parameter	Result	Units	Dilution	LOD	LOQ	Analyzed	Method	Lab
Phosphorus, tot. as P	0.023	mg/L	1	0.0060	0.020	08/16/21	4500-P E-1999	721026460

Values in brackets represent results greater than or equal to the LOD but less than the LOQ and are within a region of "Less-Certain Quantitation". Results greater than or equal to the LOQ are considered to be in the region of "Certain Quantitation". LOD and/or LOQ tagged with an asterisk(*) are considered Reporting Limits. All LOD/LOQs adjusted to reflect dilution and/or solids content.

ND = Not Detected (< LOD) LOD = Limit of Detection LOQ = Limit of Quantitation NA = Not Applicable
DWB = Dry Weight Basis %DWB = (mg/kg DWB) / 10000 1000 ug/L = 1 mg/L
MCL = Maximum Contaminant Levels for Drinking Water Samples. Shaded results indicate >MCL.

Reviewed by:

Authorized by:
R. T. Krueger
President

Enemy #1 … Phosphorus

More Phosphorus = more aquatic plants and algae

Less Phosphorus = less aquatic plants and algae

One pound of phosphorus can grow 300-500 pounds of wet algae.

Impaired Waters

North Lake (WBIC 850800) was placed on the impaired waters list for total phosphorus in 2014. The 2018 assessments showed continued impairment by phosphorus; new total phosphorus sample data exceeded the 2018 WisCALM listing thresholds for the Recreation use and Fish and Aquatic Life use. Chlorophyll-a sample data did not exceed the REC or FAL use thresholds. Based on the most updated information, no change in the existing impaired waters listing was needed.

Date 2017

Author Ashley Beranek

Impaired Waters

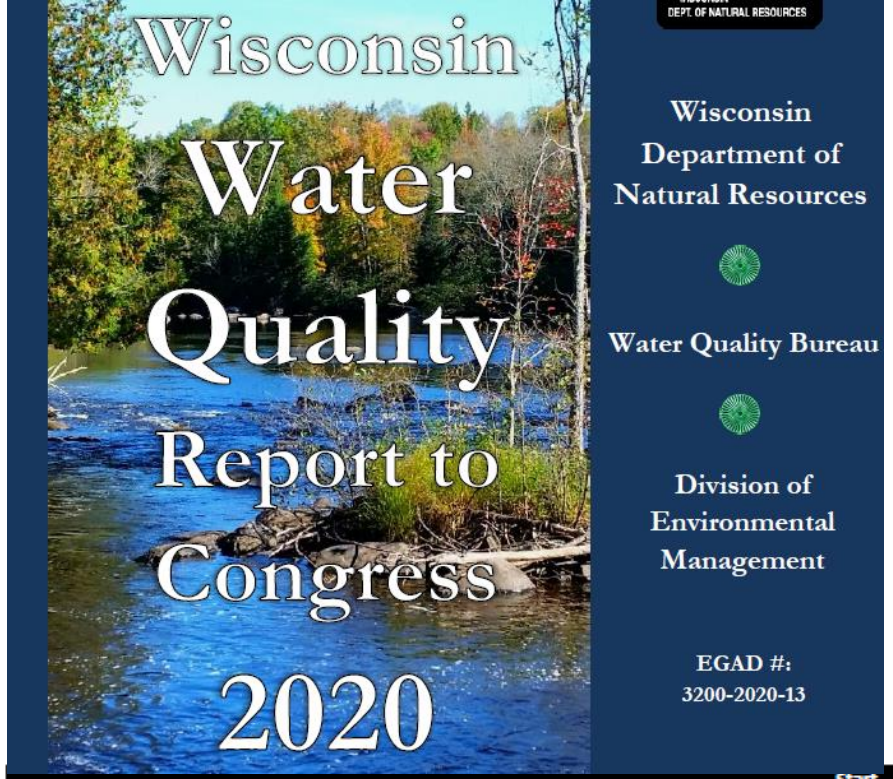
North Lake (850800) was placed on the impaired waters list for total phosphorus in 2014. The 2016 assessments showed continued impairment by phosphorus; total phosphorus sample data exceed 2016 WisCALM listing thresholds for the Recreation use and Fish and Aquatic Life use, however chlorophyll data do not exceed REC or FAL thresholds. Based on the most updated information, no change in existing impaired waters listing is needed.

Date 2015

Author Aaron Larson

Condition

Wisconsin has over 84,000 miles of streams, 15,000 lakes and milllions of acres of wetlands. Assessing the condition of this vast amount of water is challenging. The state's water monitoring program uses a media-based, cross-program approach to analyze water condition. An updated monitoring strategy (2015-2020) is now available. Compliance with Clean Water Act fishable, swimmable standards are located in the Executive Summary of Water Condition in 2018. See also the 'monitoring and projects' tab.



DEPT. OF NATURAL RESOURCES

Wisconsin Department of Natural Resources

Water Quality Bureau

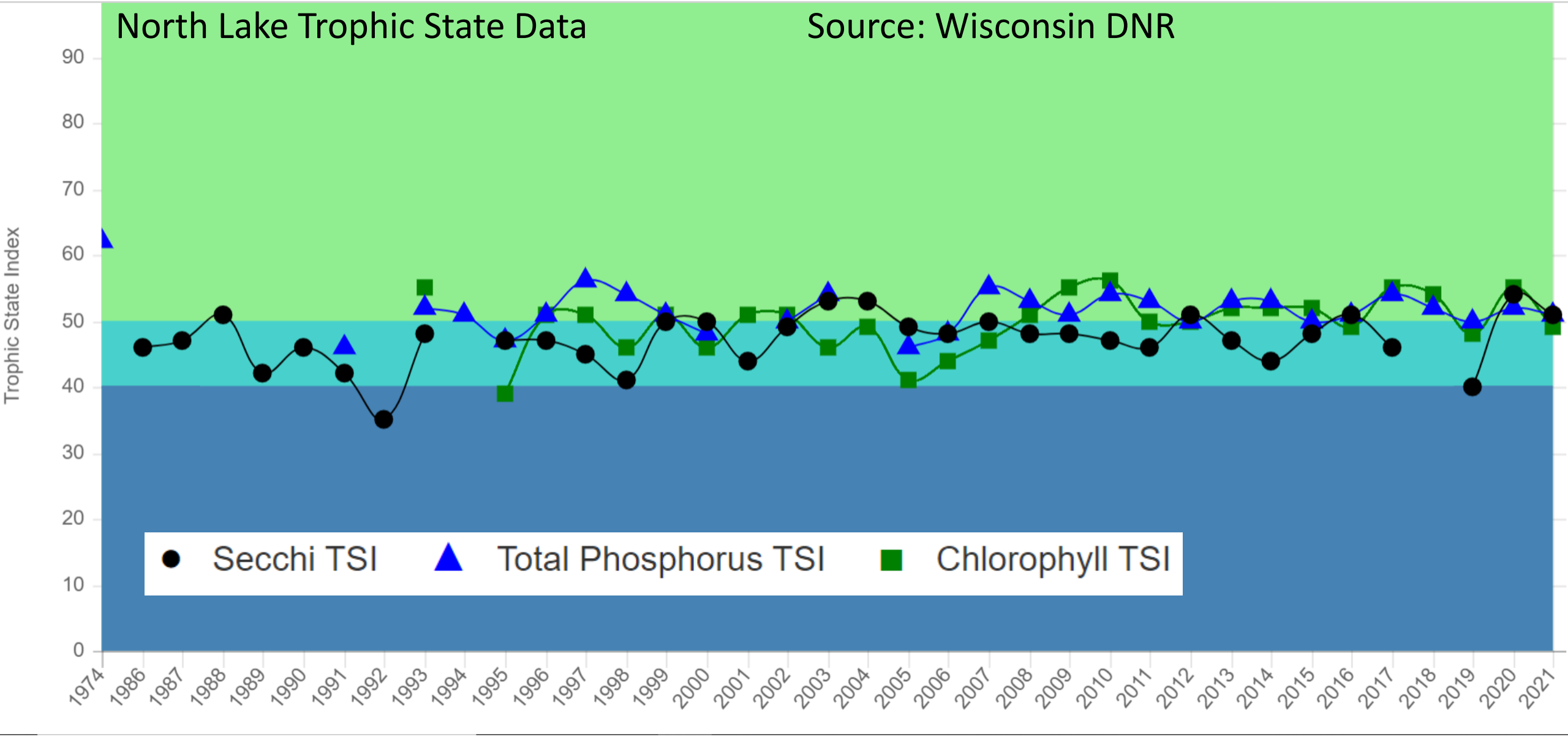
Division of Environmental Management

EGAD #: 3200-2020-13

Local Waterbody Name	Water Type	WATERS ID	WBIC	County Name	Start Mile	End Mile	Size	Units	Date Listed	Source Category	Pollutant	Impairment Indicator	Status	TMDL Priority	Listing Detail
Nichols Creek (N. B. Milw R)	RIVER	10070	27100	Sheboygan	23.48	27.8	4.32	Miles	Apr/01/2018	PS/NPS	Unknown Pollut	Elevated Water Temperature	303d Listed	Low	TMDL Needed (5A)
Ninemile Creek	RIVER	11255	366800	Langlade	0	12.96	12.96	Miles	Apr/01/2016	PS/NPS	Unknown Pollut	Elevated Water Temperature	303d Listed	Low	TMDL Needed (5A)
North Branch Manitowoc River	RIVER	9911	75900	Calumet	0	7.35	7.35	Miles	Apr/01/1998	PS/NPS	Total Phosphoru	Low DO, High Phosphorus Levels	303d Listed	Medium	TMDL Needed (5A)
North Branch Manitowoc River	RIVER	9911	75900	Calumet	0	7.35	7.35	Miles	Apr/01/1998	PS/NPS	Sediment/Total	Low DO, Degraded Habitat	303d Listed	Medium	TMDL Needed (5A)
North Branch Oak Creek	RIVER	9967	14900	Milwaukee	0	5.7	5.7	Miles	Apr/01/2018	PS/NPS	Chloride	Chronic Aquatic Toxicity, Acute Aquatic Toxicity	303d Listed	Low	TMDL Needed (5A)
North Branch Of Pike River	RIVER	10532	1900	Kenosha, Racine	0	5.23	5.23	Miles	Apr/01/1998	PS/NPS	Unknown Pollut	Chronic Aquatic Toxicity	303d Listed	Low	Watershed Plan (5W)
North Branch Of Pike River	RIVER	10532	1900	Kenosha, Racine	0	5.23	5.23	Miles	Apr/01/2008	PS/NPS	Sediment/Total	Degraded Habitat	303d Listed	Low	Watershed Plan (5W)
North Branch O'Neill Creek	RIVER	14265	1749600	Clark	0	17.2	17.2	Miles	Apr/01/2014	NPS	Total Phosphoru	High Phosphorus Levels	303d Listed	Medium	TMDL Needed (5A)
North Branch Pigeon River	RIVER	9714	293900	Waupaca	0	5.34	5.34	Miles	Apr/01/2018	PS/NPS	Unknown Pollut	Degraded Biological Community, Elevated Water Temperature	303d Listed	Low	TMDL Needed (5A)
North Branch Pike River	RIVER	425919	1900	Racine	5.23	7.87	2.64	Miles	Apr/01/2018	NPS	Chloride	Chronic Aquatic Toxicity	303d Listed	Low	Watershed Plan (5W)
North Flowage	IMPOUNDMENT	14153	1700300	Monroe			211	Acres	Apr/01/2002	Atm. Dep.	Mercury	Mercury Contaminated Fish Tissue	303d Listed	Low	Mercury Atm. Dep. (5B)
North Fork Beaver Creek	RIVER	1181543	1682500	Jackson	11.59	19.49	7.9	Miles	Apr/01/2016	PS/NPS	Total Phosphoru	High Phosphorus Levels	303d Listed	Medium	TMDL Needed (5A)
North Fork Eau Claire	RIVER	6923349	2145400	Clark, Eau Claire	10.49	22.48	11.99	Miles	Apr/01/2018	PS/NPS	Total Phosphoru	Impairment Unknown	303d Listed	Low	Watershed Plan (5W)
North Fork Eau Claire	RIVER	16146	2145400	Eau Claire	0	10.49	10.49	Miles	Apr/01/2018	PS/NPS	Total Phosphoru	Impairment Unknown	303d Listed	Low	Watershed Plan (5W)
North Fork Eau Claire River	RIVER	6923457	2145400	NA	22.48	53.91	31.43	Miles	Apr/01/2018	PS/NPS	Total Phosphoru	Impairment Unknown	303d Listed	Medium	Watershed Plan (5W)
North Fork Of Beaver Creek	RIVER	14094	1682500	Trempealeau	0	11.59	11.59	Miles	Apr/01/2016	PS/NPS	Total Phosphoru	High Phosphorus Levels	303d Listed	Medium	TMDL Needed (5A)
North Fork Willow River	RIVER	16413	2606900	St. Croix	32.47	40.59	8.12	Miles	Apr/01/2018	PS/NPS	Total Phosphoru	Impairment Unknown	303d Listed	Low	Watershed Plan (5W)
North Lake	LAKE	11496	850800	Waukesha			440.45	Acres	Apr/01/2014	NPS	Total Phosphoru	Impairment Unknown	303d Listed	Low	Watershed Plan (5W)
North Spirit Lake	LAKE	425815	1515200	Price, Taylor			224.35	Acres	Apr/01/2012	NPS	Total Phosphoru	Eutrophication, Excess Algal Growth	TMDL	High	Natural Conditions (5C)

Eutrophication - Excessive richness of nutrients in a lake or other body of water, frequently due to runoff from the land, which causes a dense growth of plant life and death of animal life from lack of oxygen.

Causes of Eutrophication - Fertilizers (nitrates and phosphates) Eutrophication is predominantly caused by human actions due to their dependence on using nitrate and phosphate fertilizers.


North Lake Trophic State Data
Source: Wisconsin DNR
Trophic State Index
90
80
70
60
50
40
30
20
10
0
1974
1986
1987
1988
1989
1990
1991
1992
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2015
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2017
2018
2019
2020
2021
Secchi TSI
Total Phosphorus TSI
Chlorophyll TSI

North Lake can’t keep up with the amount of nutrients coming into the lake, it is becoming eutrophic. It and Mason Creek are classified as an “Impaired Waterway” due to total Phosphorus

TSI	TSI Description
TSI < 30	Classical oligotrophy: clear water, many algal species, oxygen throughout the year in bottom water, cold water, oxygen-sensitive fish species in deep lakes. Excellent water quality.
TSI 30-40	Deeper lakes still oligotrophic, but bottom water of some shallower lakes will become oxygen-depleted during the summer.
TSI 40-50	Water moderately clear, but increasing chance of low dissolved oxygen in deep water during the summer.
TSI 50-60	Lakes becoming eutrophic: decreased clarity, fewer algal species, oxygen-depleted bottom waters during the summer, plant overgrowth evident, warm-water fisheries (pike, perch, bass, etc.) only.
TSI 60-70	Blue-green algae become dominant and algal scums are possible, extensive plant overgrowth problems possible.
TSI 70-80	Becoming very eutrophic. Heavy algal blooms possible throughout summer, dense plant beds, but extent limited by light penetration (blue-green algae block sunlight).
TSI > 80	Algal scums, summer fishkills, few plants, rough fish dominant. Very poor water quality.

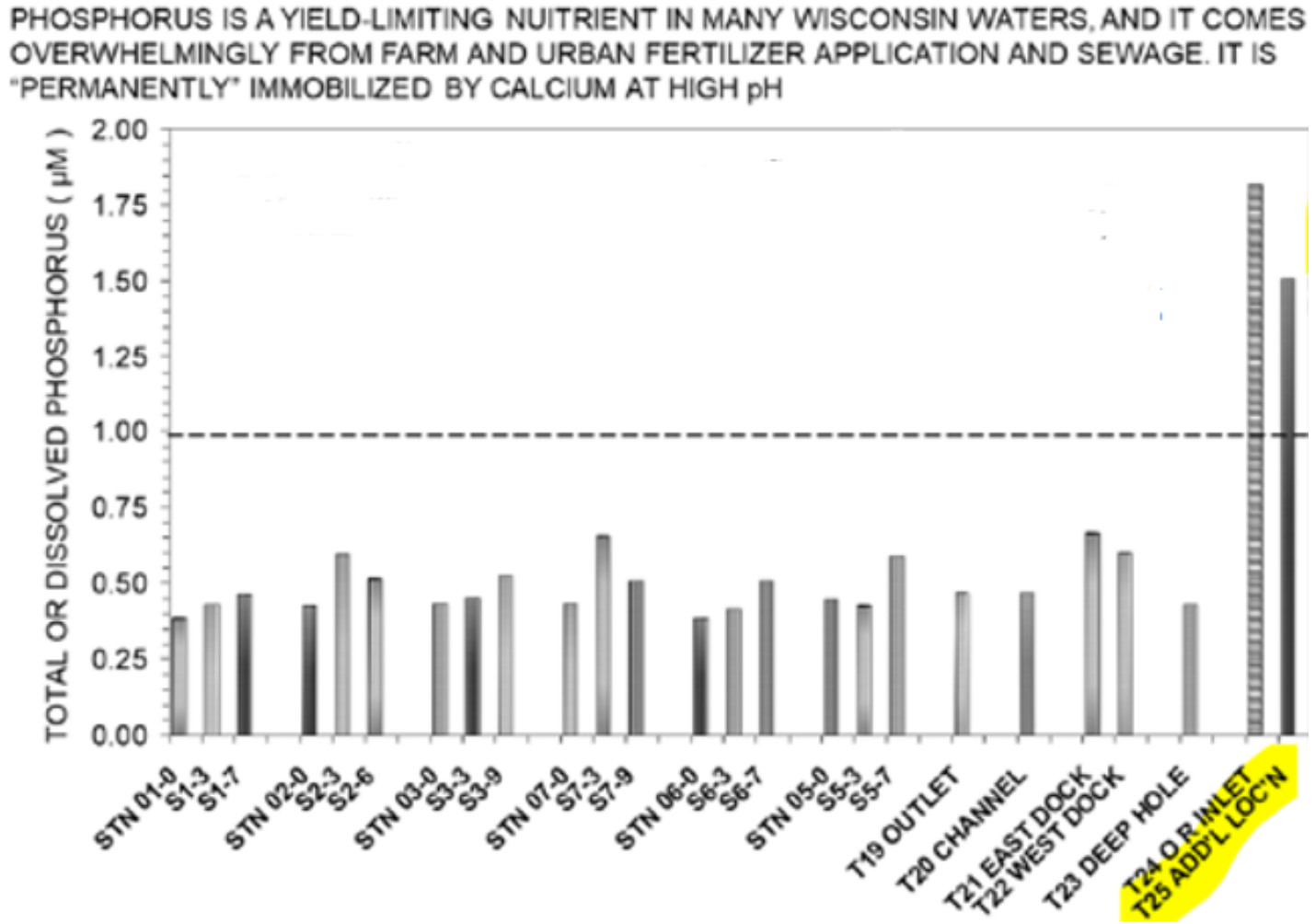
Indicators that the lake is becoming eutrophic

- Increased aquatic plant growth
- Increased Algae
- Low dissolved oxygen readings
- Cisco die off due to low dissolved oxygen and high water temperatures
- Reduced Water clarity

Low DO levels and high temperatures led to 150+ dead Cisco between 8/21 & 8/23

8/21/2020		
9:32 a.m.		
Small Lake deep hole		
Depth in feet	**DO mg/l**	**Temp F**
5	8.79	76.7
10	8.74	77.1
15	7.85	76.1
17.5	3.6	71.5
19	1.83	69.4
20	0.85	68.8
25	0.23	57.1
30	0.16	54
35	0.23	50.3
40	0.49	47.5

Phosphorus Levels in Ice House Bay



3 x the amount at other test locations on June 6th, 2021

Phosphorus Levels in Ice House Bay

Testing Date: August 6th

Conditions: Extremely low flows in river, extended period of no rain

Ice House Bay 0.031 mg/L : 2X the level of impairment for North Lake

Schneider Bay (where Mason Creek enters the lake) : 0.027 mg/L

Big Lake Deep Hole (south end) : 0.023 mg/L

Sources of Phosphorus entering North Lake

- Mason Creek
- Oconomowoc Rivers (big & little) – Funk's Dam failure in early 70's. Funks dam removal in 92, Monches Dam replacement in 2013
- Cornell Inlet
- Goose and Duck feces
- Failing Septic systems
- Yard runoff (fertilizer, pet waste)
- Resuspension of phosphorus laden sediment by waves (wind & boats)
- Carp stir up the sediment and release phosphorus
- Nutrient cycling from rooted aquatic plants that grow and die
- Urban runoff from Downtown North Lake

Steps to further reduce phosphorus in North Lake

- Reduce phosphorus coming in through inlets

  NLMD, OWPP, & Tall Pines are doing great work on the Oconomowoc River and Mason Creek Using the SEWRPC Watershed Protection Plan as a guide

- Physically remove weeds from the lake

- Remove carp from the lake

- Dredge inlets to firm marl bottom to remove phosphorus rich sediment

Why should we dredge Ice House Bay?

SEDIMENT DEPOSITS IN NORTH LAKE AND THE OCONOMOWOC RIVER

If the sediment deposits in the reach of the river just above North Lake are not dredged as suggested in Chapter 3, it is likely that they would eventually migrate downstream into the lake and accumulate near the shore or end up in deeper parts of the lake. In the mean time, the river would remain shallow and difficult to navigate. The soft bottom would not be a good place for fish to spawn.

If the sediment deposits are not dredged in the near shore areas as suggested in Chapter 3, there will continue to be nuisances associated with them. Swimming will be impeded due to the shallow depths and soft bottom. It is possible that aquatic macrophyte growth will increase in these areas to nuisance proportions if it has not already done so. It is also possible that the sediment deposits in these near shore areas will be moved by wave action to deeper parts of the lake over time.

Source: RA Smith Former Funk's Dam Impoundment Study February 1995

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Why should we dredge Ice House Bay?

We don’t want our lake to look like this: Picture taken 8/24/2021 in Ice House Bay


July 29, 2020

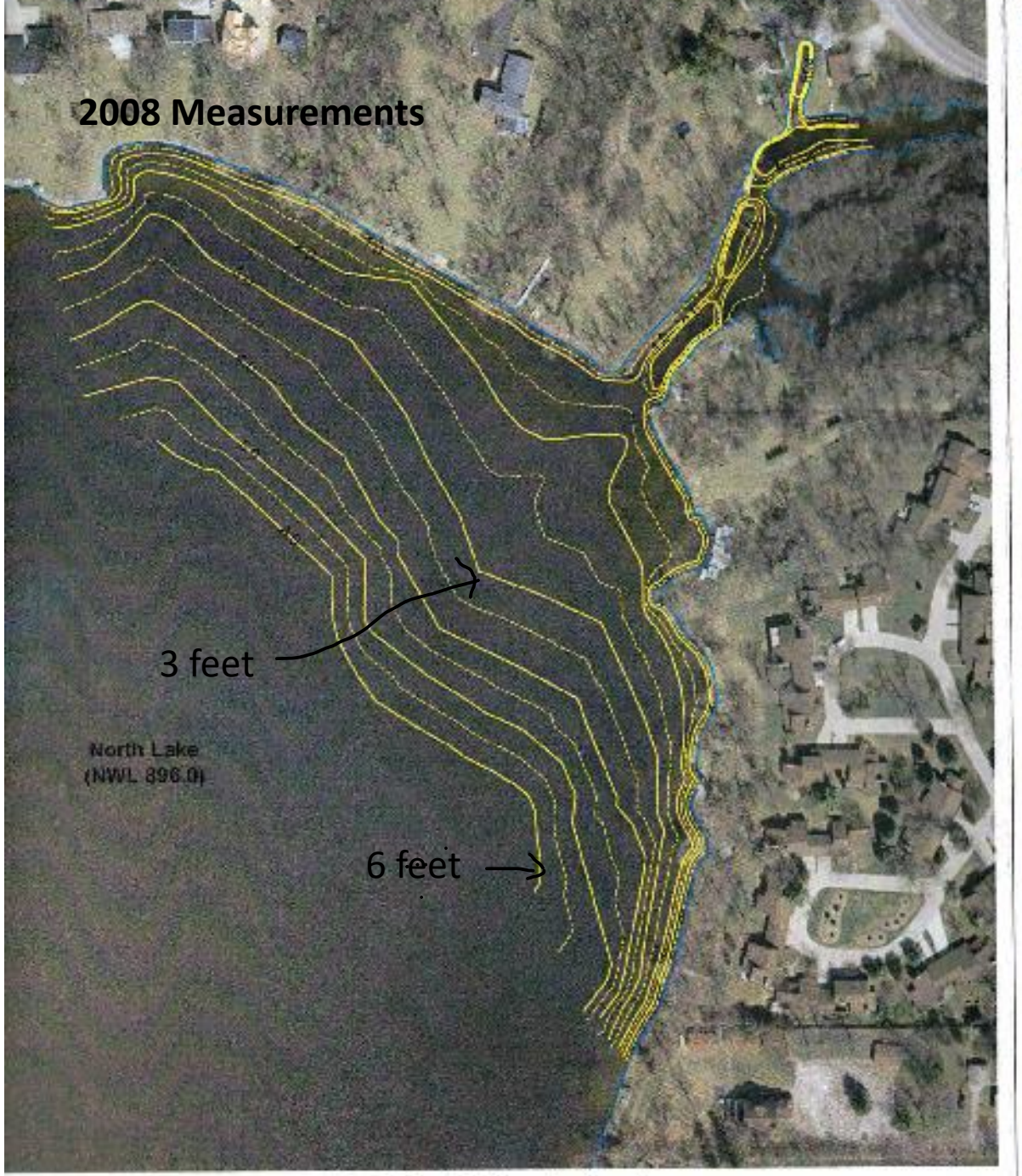

Ice House Bay August 20, 2021


Schneider Bay July 2019

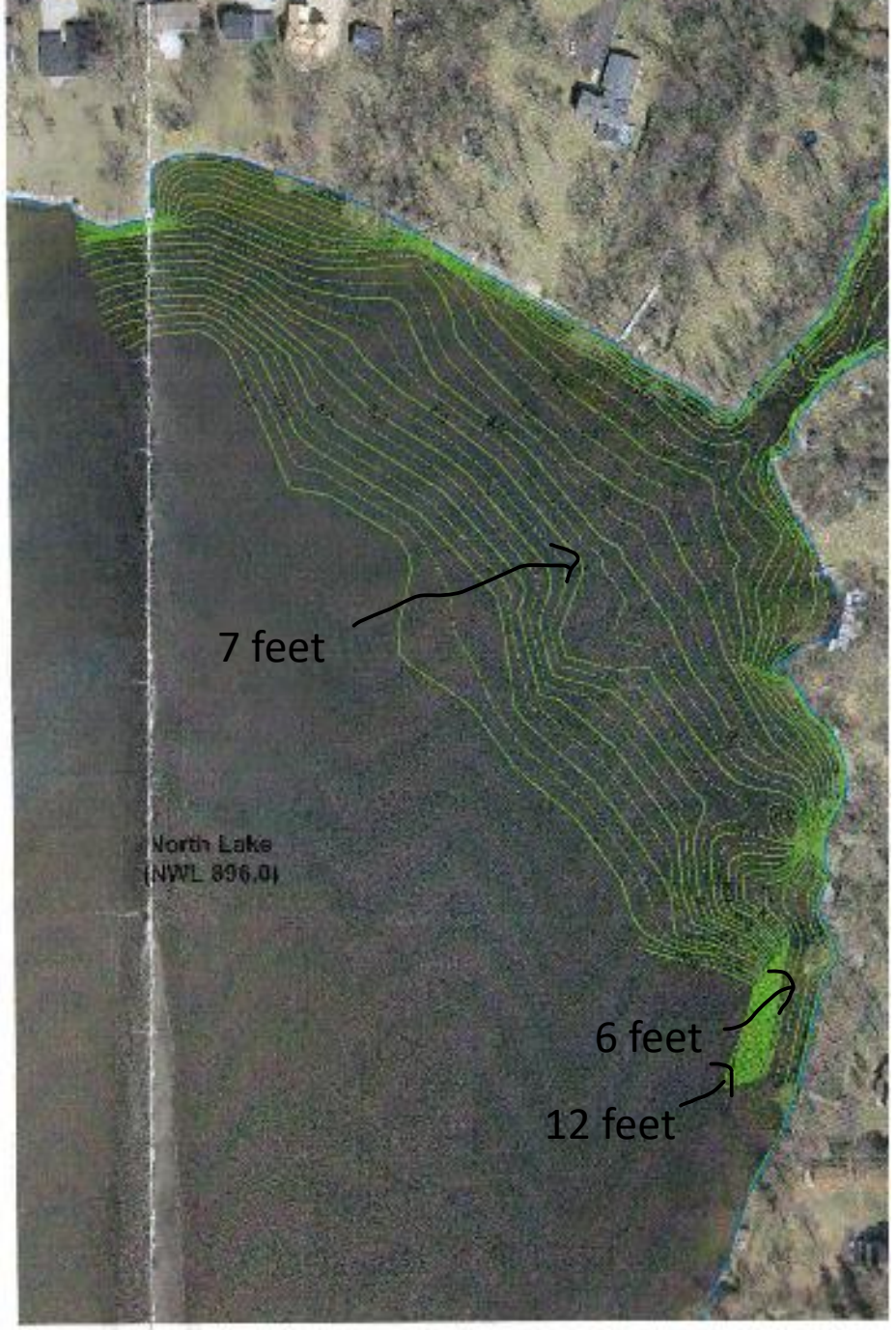
This is what the water in the bay looks like on a windy day when the sediment is resuspended by waves

NLMD's Approach since 1992 Funks Dam failure

- Clean up the tributaries first and then remove sediment from the lake
- For the past 30 years, the focus has been on the watershed
- We believe that now is the time to remove the sediment from the lake to prevent further damage to the lake

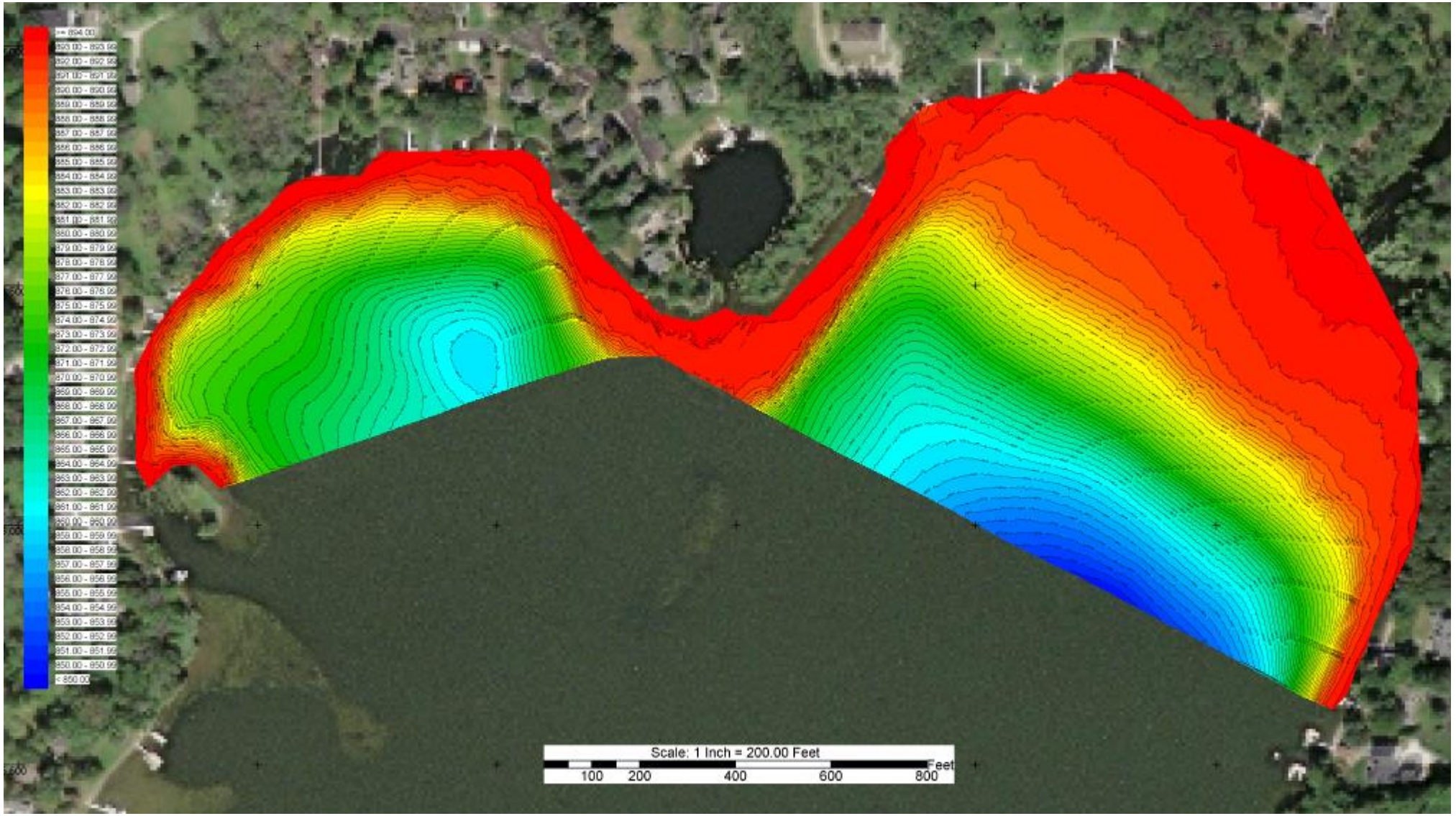


Soft Sediment Surface Contouring

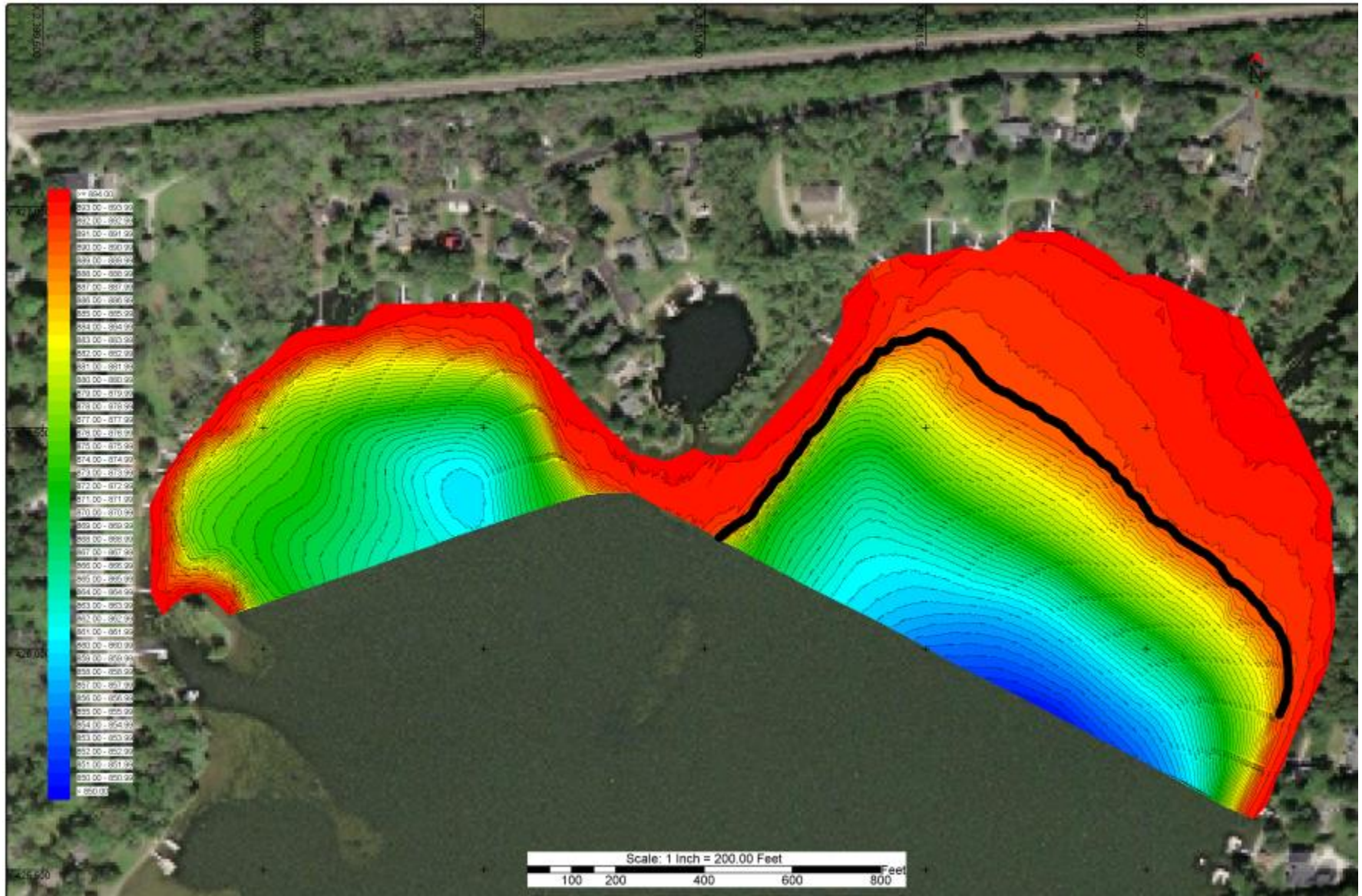


Hard Surface Contouring

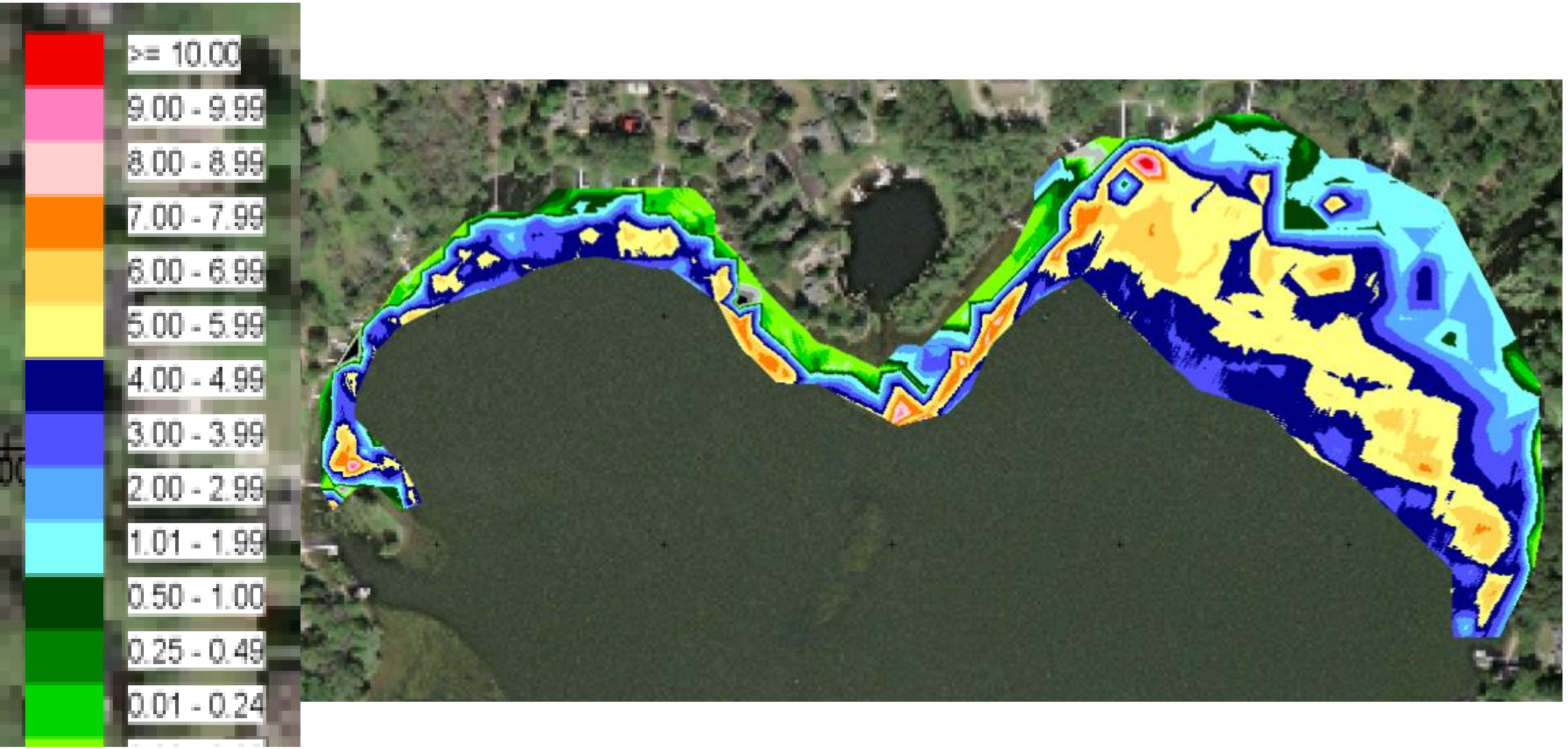
Updated Contour Map November 2021



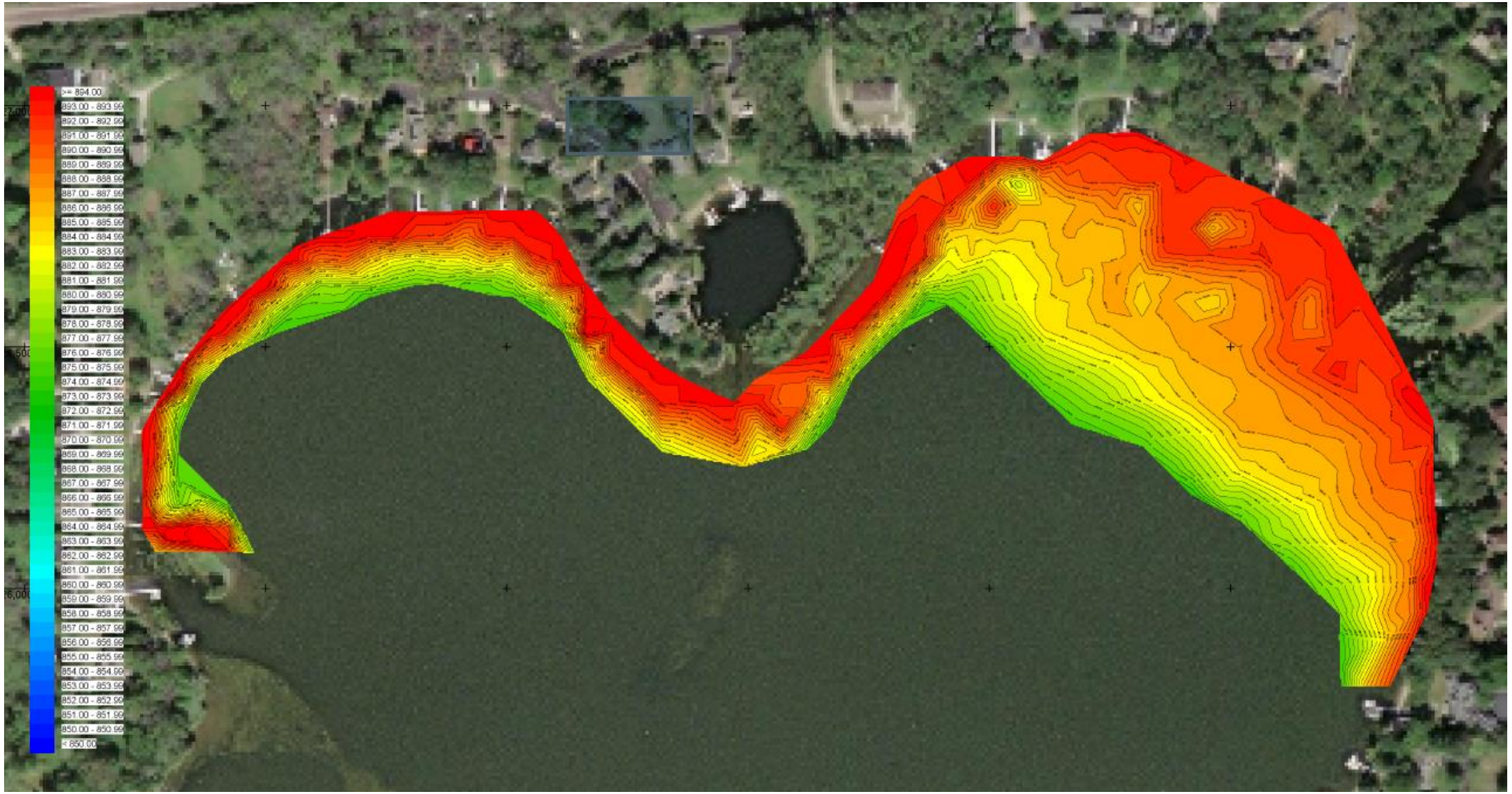
Updated Contour Map November 2021 – 3’ depth line



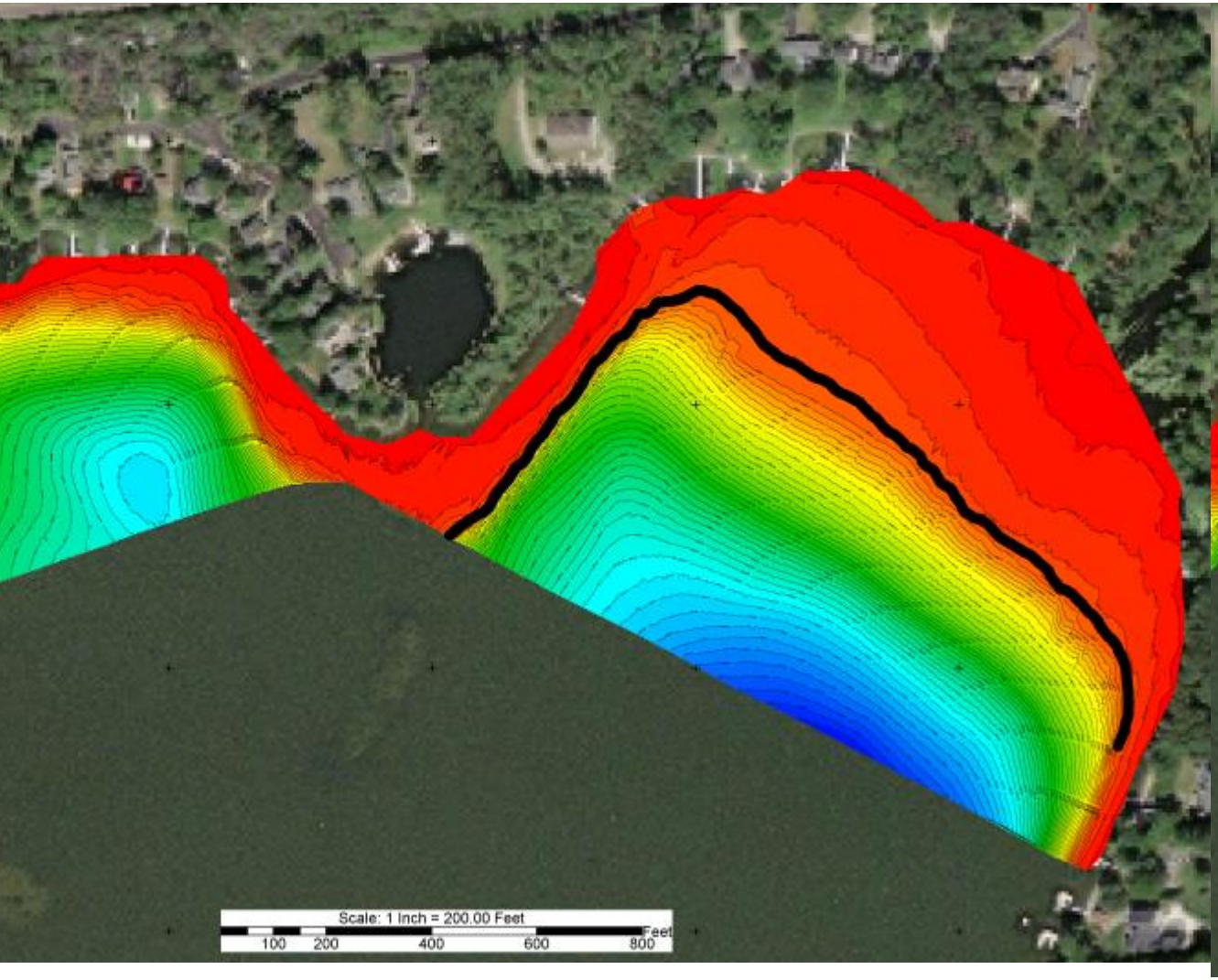
Sediment depth map November 2021

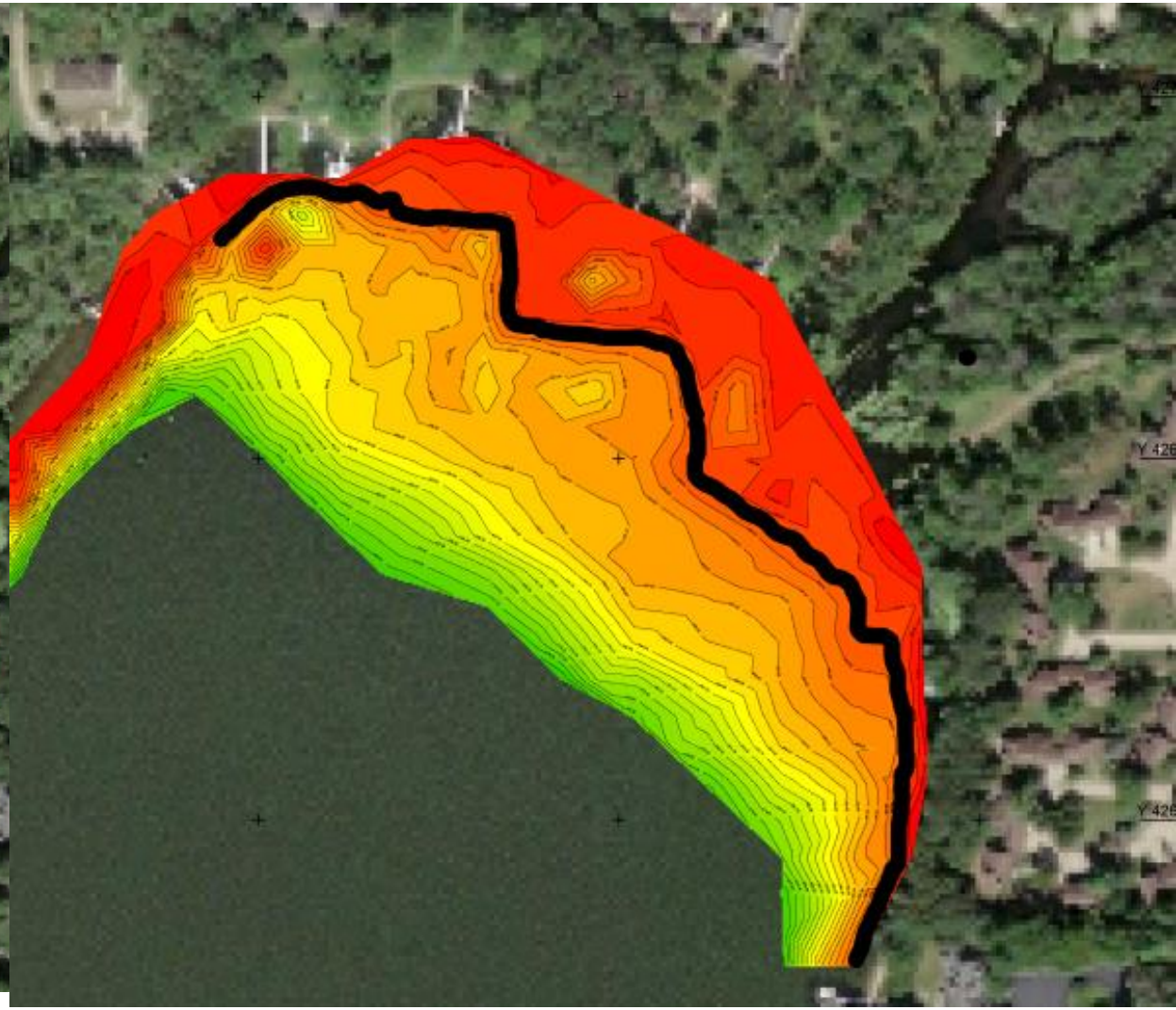


Proposed lake depth map after dredging



3 foot depth before and after dredging project





Sediment as it comes out of the lake

Very high in Phosphorus

Very high in Nitrogen

There is approx 5,500 quad axle dump trucks of this sediment in Ice House Bay

Parameter	Units	Core Sample						Wisconsin DNR (2003)			Illinois (1996)	
		#1	#2	#3	#4	#5	#6	TEC	MEC	PEC	Elevated	Highly Elevated
Nitrogen, Ammonia (As N)	mg/kg	258	264	346	325	620	294	-	-	-		
Nitrogen, Nitrate (As N)	mg/kg	3.8	1.9	1.7	0.17	0.18	0.12	-	-	-		
Nitrogen, Nitrite	mg/kg	2.2	1.9	2	2.3	2.2	2	-	-	-		
Phosphorus, Total Orthophosphate	mg/kg	0.94	0.87	1.01	0.55	3.15	0.72	-	-	-		
Phosphorus, Total (As P)	mg/kg	707	252	444	58.6	102	323	-	-	-	1,115 to 2,179	>2,179
Percent Moisture	%	50.1	50.3	50.5	67.8	66.4	57.2	-	-	-		
Nitrogen, Kjeldahl, Total	mg/kg	4560	3700	4820	6020	6220	3840	-	-	-	5,257 to 11,700	>11,700
Arsenic	mg/kg	< 3.58	< 3.81	< 3.69	< 5.75	< 5.88	< 4.52	9.8	21.4	33	14 to 95.5	>95.5
Cadmium	mg/kg	< 1.79	< 1.91	< 1.84	< 2.88	< 2.94	< 2.26	0.99	3	5	5 to 14	>14
Chromium	mg/kg	6.5	< 7.62	5.7	11	11	< 9.04	43	76.5	110	27 to 49	>49
Copper	mg/kg	6.45	6.86	4.55	12	10.3	3	32	91	150	100 to 590	>590
Lead	mg/kg	3.72	8.35	2.3	12.9	5.91	< 4.52	36	83	130	59 to 339	>339
Nickel	mg/kg	5.34	4.86	4.15	7.85	6.79	2.4	23	36	49	31 to 43	>43
Zinc	mg/kg	40.3	39.5	17	71.3	32.4	10.1	120	290	460	145 to 1,100	>1,100
Mercury	mg/kg	0.037	0.036	< 0.0604	0.051	< 0.0661	< 0.0563	-	-	-	0.15 to 0.701	>0.701
Organochlorine Pesticides												
4,4'-DDE	ug/kg	< 19.5	< 20	< 19.8	< 30	< 29.5	< 23.7	3.2	17	31		
4,4'-DDT	ug/kg	< 19.5	< 20	< 19.8	< 30	< 29.5	< 23.7	4.2	33.6	63	10 to 180	>180
Chlordane	ug/kg	< 58.6	< 60.1	< 59.3	< 90.1	< 88.5	< 71.1	3.2	10.6	18	5 to 12	>12
Decachlorobiphenyl	ug/kg	111	123	81.5	66.5	107	73.5	-	-	-	-	-
TCMX	ug/kg	97	111	67	52	85.5	63.5	-	-	-	-	-
Polychlorinated biphenyls (PCBs)												
Aroclor 1016	ug/kg	< 97.6	< 2580	< 98.6	< 150	< 148.	< 116	-	-	-	-	-
Aroclor 1221	ug/kg	< 97.6	< 2580	< 98.6	< 150	< 148.	< 116	-	-	-	-	-
Aroclor 1232	ug/kg	< 97.6	< 2580	< 98.6	< 150	< 148.	< 116	-	-	-	-	-
Aroclor 1242	ug/kg	< 97.6	< 2580	< 98.6	< 150	< 148.	< 116	-	-	-	-	-
Aroclor 1248	ug/kg	< 97.6	< 2580	< 98.6	< 150	< 148.	< 116	-	-	-	-	-
Aroclor 1254	ug/kg	< 97.6	< 2580	< 98.6	< 150	< 148.	< 116	-	-	-	-	-
Aroclor 1260	ug/kg	< 97.6	< 2580	< 98.6	< 150	< 148.	< 116	-	-	-	-	-
PCB Total	ug/kg	-	-	-	-	-	-	60	368	679	10 to 89	>89

Tomato plant experiment

Plant on left was grown from seed in normal topsoil

Plant on right was grown from seed in sediment from the north bay

All other variables were constant

How will we remove the sediment? By using a Hydraulic Dredge

The dredge will pump the sediment thru a hose to the dewatering site

Dredge pipeline with floats

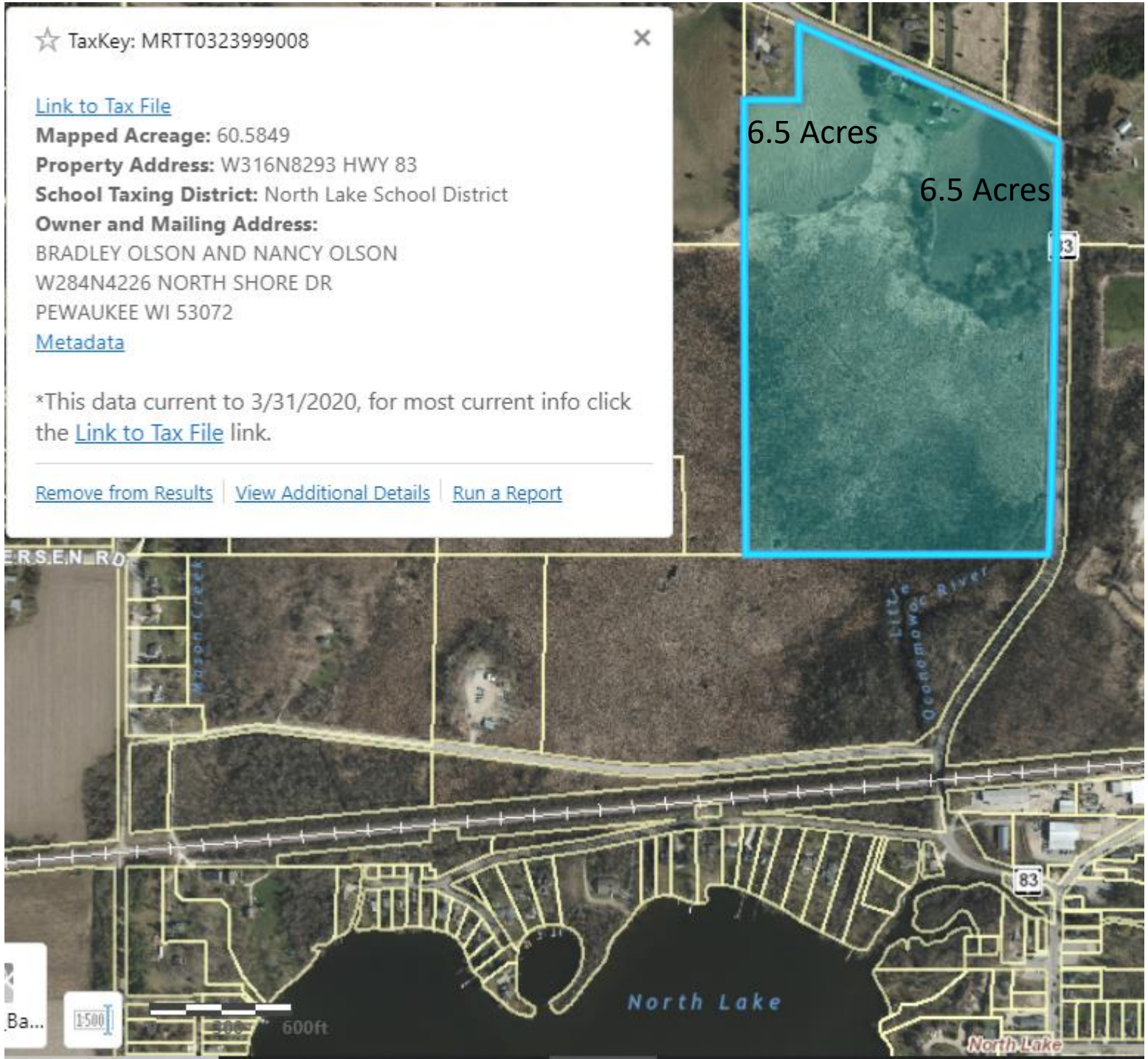
Dewatering of sediment in settling basins

Dewatering Site

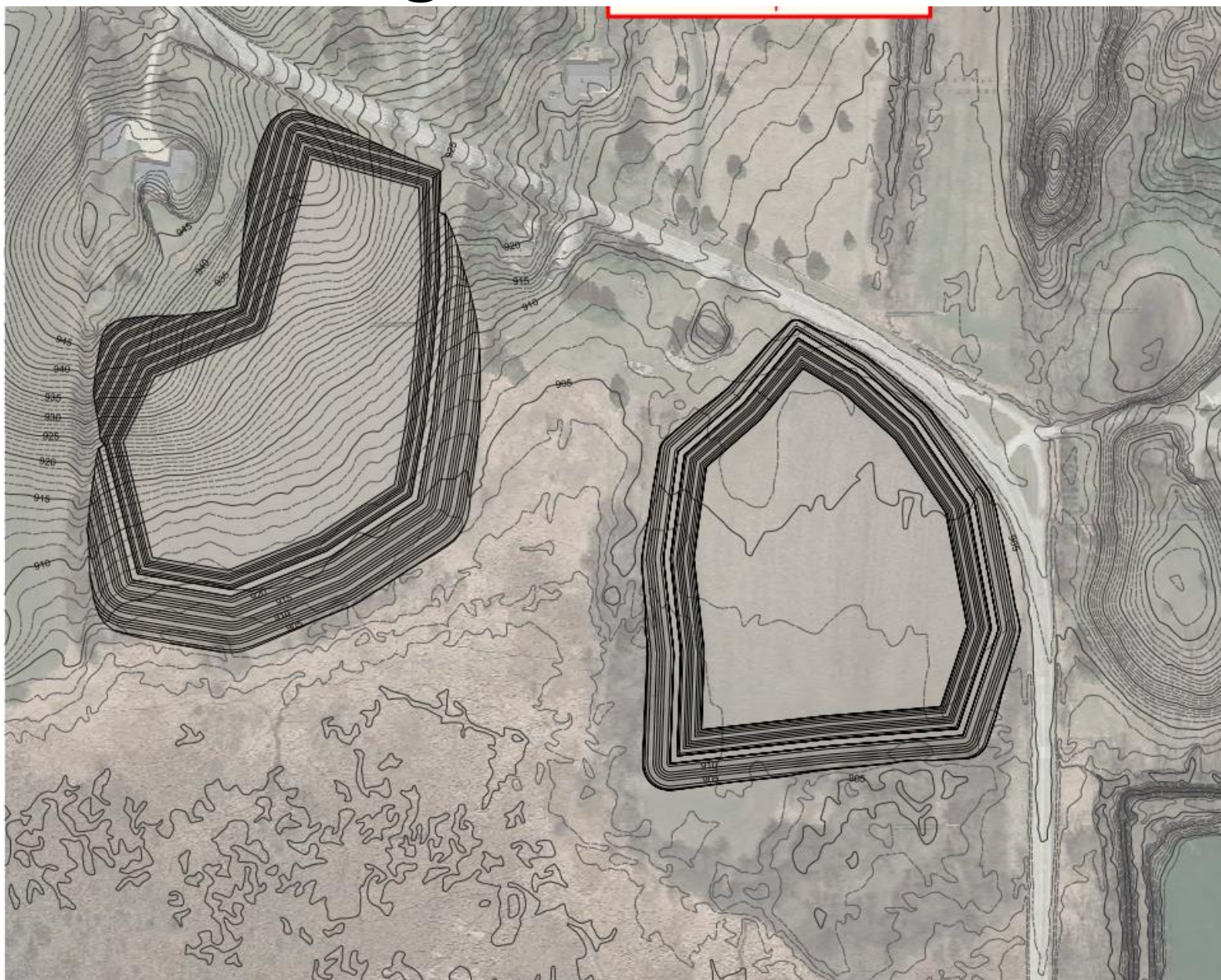
Olson Property – access thru little Oconomowoc River

3200 ft from mouth of Oconomowoc River

Elevation is 5’ to 10’ higher than lake



Dewatering basin potential design



Recommendation from OWPP

As you are aware the City of Oconomowoc has been granted authority to work in the Oconomowoc River Watershed to help meet the Rock River TMDL Study requirements for reducing phosphorus in the Rock River Basin. The platform for this work is an Adaptive Management Plan which was approved for the City by the Wisconsin DNR in September of 2015. The Adaptive Management Plan's specific goals for the City are to reduce erosion and nutrient load throughout the watershed with the goal of reducing sediment and phosphorus in the Oconomowoc River where it joins with the Rock River in the Town of Ixonia. The Adaptive Management Plan is an integral part of the City's overarching phosphorus reduction program entitled the Oconomowoc Watershed Protection Program, (OWPP). The North Lake Management District is a partner in this program.

The accumulated silt in the northeast corner of North Lake is the result of decades of loading into the lake from the Oconomowoc River, and the Little Oconomowoc River. These silts hold legacy nutrients such as phosphorus and if disturbed, can release these nutrients back into the flowstream and increase the level of phosphorus in the lake and

Recommendation from Oconomowoc Watershed Protection Program

The proposed dredging project will remove the legacy nutrients that have accumulated in this corner of the lake and help to improve water quality in the lake and in the river. This letter is written to convey our full support of the North Lake Management District's

proposed dredging project as it will certainly assist in our phosphorus reduction efforts in the watershed.

Sincerely,

Kevin A Freber

Kevin Freber
Wastewater Utility Operations Manager
OWPP Director

CC: Darrell Smith, OWPP
Tom Steinbach, Tall Pines Conservancy

Recommendation from SEWRPC

The District's focus on protecting Lake health, ameliorating human-imposed sedimentation, reducing sediment and pollutant loads to waterbodies, and improving Lake water quality are entirely consistent with the Commission's regional and local water quality management goals. For this reason, the Commission supports the District's proposed Lake management efforts.

Sincerely,

Kevin Muhs, PE, AICP
Executive Director

Current Status

- DNR has approved our Dredging Permit many thanks to Maureen McBroom for her help navigating the DNR permitting process

- Lease agreement with landowner for dewatering site has been signed

- Pipeline access agreement has been signed by Halquist Stone Company, Inc

- Project was put out to bid to dredging contractors, winning bid was submitted by Michels Corp. MICHELS® Tim Michels is an owner of Michels Corporation and a North Lake resident. Tim personally pledged a significantly large dollar contribution to the effort last summer long before the request for bids went out. Tim has stated he will be intimately overseeing the dredging to ensure Michels does the absolute best job possible.

- Continue to raise financial support with North Lake residents

Next Steps

- Additional fundraising
- Complete a full and accurate cost estimate
- Deliver entire dredging presentation to property owners and request approval from owners at NLMD special meeting to be held in May.
- Execute agreements with contractor(s)
- Amendment to DNR permit for additional sediment volume
- Waukesha county conditional use permit and stormwater permit by contractor
- Wisconsin Pollutant Discharge Elimination System (WPDES) permit by contractor

When will the work take place?

- Prep work outside of the lake will begin in July
- In lake work will begin after Labor Day, 2022
- If work is not completed prior to Ice up, work will resume in 2023

How much will it cost?

Michels Corp Bid Response					
Description	**Unit**	**Quantity**	**Total**	**124,745 yards**	**50,000 yards**
Mobilization/Demobilization	Lump Sum		$ 100,025.02	$ 100,025.02	$ 100,025.02
Site Set-up/Erosion Control	Lump Sum		$ 511,325.25	$ 511,325.25	$ 511,325.25
Dredging first 50,000	Cubic Yard		$ 325,500.00	$ 325,500.00	$ 325,500.00
Dredging additional volume over 50,000	Cubic Yard	74745	$ 6.51	$ 486,589.95	$ -
Dewatering of Dredged Sediment	Cubic Yard	124745	$ 2.37	$ 295,645.65	$ 118,500.00
Water Quality Management	Lump Sum		$ 10,600.00	$ 10,600.00	$ 10,600.00
Site Restoration	Lump Sum		$ 205,243.00	$ 205,243.00	$ 205,243.00
				$ 1,934,928.87	$ 1,271,193.27
				$ 663,735.60	more than 50K #

How are we going to pay for it?

- Donations – YTD commitments of $845,500
- Grants
  - OWPP $25,000 with possibility of more
  - Town of Merton American Rescue Plan Act funds
- NLMD cash reserves approximately $300,000 with property owner approval
- NLMD assessments if required and approved by property owners

You can fund the removal of a dump truck full of sediment from North Lake!

We have raised almost enough money to remove 50,000 cubic yards of sediment from North Lake. There are significant setup costs for this project. Each additional cubic yard can be removed for only **$8.88**. We have ***3,300*** more truckloads to remove!

You can fund the removal of a dump truck(s) full of sediment from North Lake!

For $200, you can remove a quad axle dump truck (22.5 cubic yards) of sediment from North Lake!

For $1,000, you can remove 5 truckloads (112.5 cubic yards)!

For $10,000, you can remove 50 truckloads (1,125 cubic yards)!

For $25,000, you can remove 125 truckloads (2,812.5 cubic yards)!

For $50,000 you can remove 250 truckloads (5,635 cubic yards)!

Thank you

- Maureen McBroom for her guidance in the DNR permitting process.
- Michels' Family for a significant financial pledge to get the project started
- All those that have already made a financial commitment to the project

NOW IS THE TIME TO ACT!

If you support the project, please return a financial commitment form ASAP!

We will vote in May to approve the project. We will only be removing the amount of sediment that we can pay for with money raised.

Collection of funds will occur once the project is approved by NLMD members.

Questions?

Contact Mark Theisen
markjtheisen@gmail.com
Cell 414-750-5657