

## PROPOSED AGENDA

**CHARTER TOWNSHIP OF BRIGHTON  
BOARD OF TRUSTEES  
4363 BUNO ROAD  
BRIGHTON, MI 48114**

**JANUARY 14, 2026  
SPECIAL MEETING  
6:30 P.M.  
(810) 229.0560**

- A. CALL TO ORDER
- B. PLEDGE OF ALLEGIANCE
- C. ROLL CALL
- D. CALL TO THE PUBLIC
- E. APPROVAL OF AGENDA
- F. BUSINESS
  - 1. DISCUSSION WITH WOODLAND LAKES WATER QUALITY COMMITTEE
- G. CALL TO THE PUBLIC
- H. ADJOURNMENT

The Charter Township of Brighton will provide necessary reasonable auxiliary aids and services such as signers for the hearing impaired and audiotapes of printed materials being considered at the meeting to individuals with disabilities at the meeting. Individuals should contact the Charter Township of Brighton by writing or contacting: Township Manager, 4363 Buno Road, Brighton, Michigan 48114. Telephone: (810) 229.0550.

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**MEMORANDUM**

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**TO:** BRIGHTON TOWNSHIP RESIDENTS  
**FROM:** JOSEPH R. RIKER, CLERK  
**SUBJECT:** BOARD OF TRUSTEES ELECTRONIC BOARD PACKETS  
**DATE:** JANUARY 31, 2019

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Board packets for the Brighton Township Board of Trustees meetings posted to the website contain scanned original documents. These electronic packets are subject to change based on meeting material presented to the Board throughout the course of the meeting. For a complete original packet following the Board meeting contact the Clerk's Office at 810-229-0560 or via email: [clerk@brightontwp.com](mailto:clerk@brightontwp.com)

## **Organization of Woodland Lake (OWL)**

Discussion of concerns and research understandings relative to the Proposed PUD Development

RZ #25/01 FOR THE COVE AT WOODLAND LAKE

## Woodland Lake Water Quality standardized locations for Limnology assessments

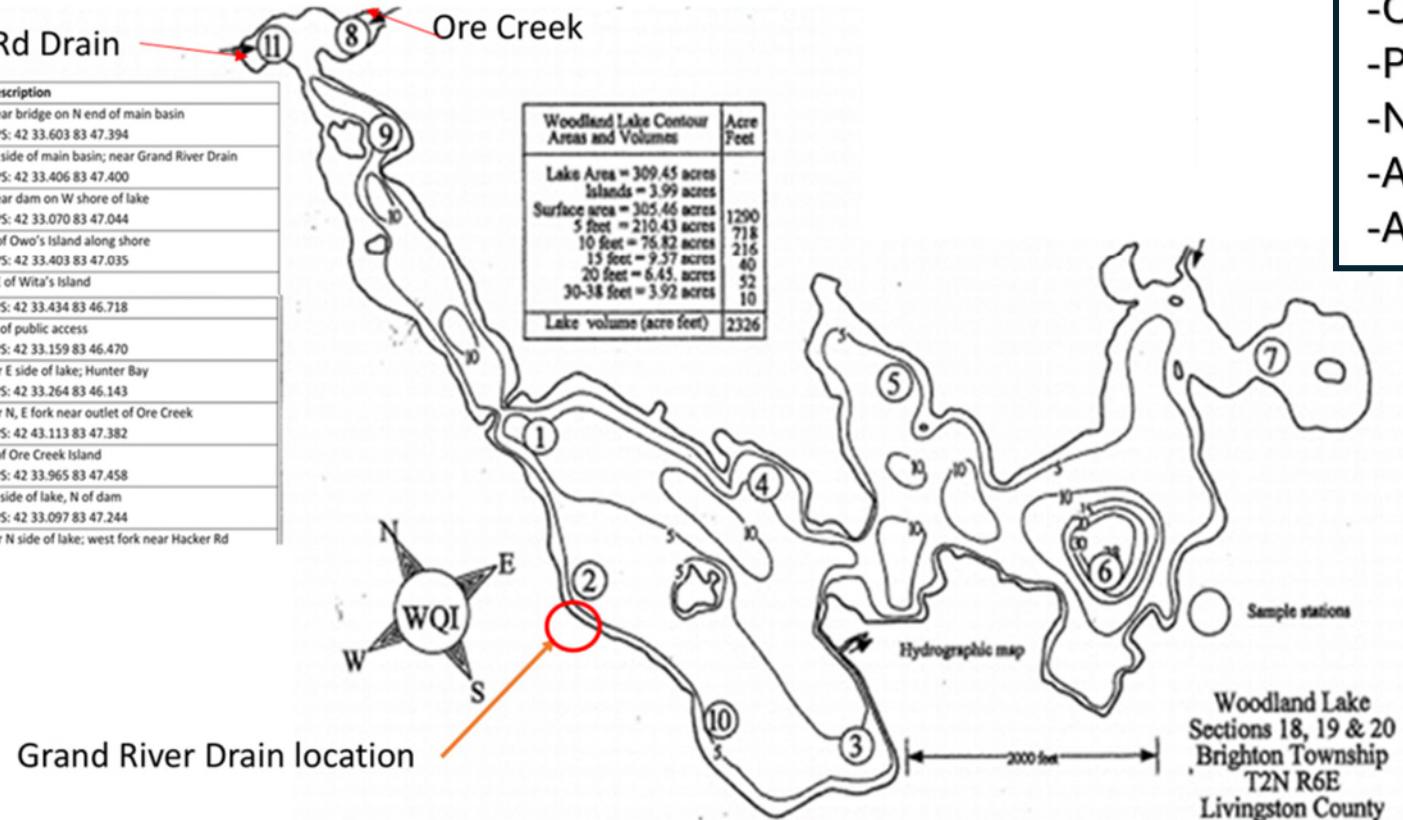
The numbered locations shown on the below map indicate the sites for chemical, nutrient and clarity comparisons throughout each year. The following charts show trending across key sites over time

Hacker Rd Drain

Ore Creek

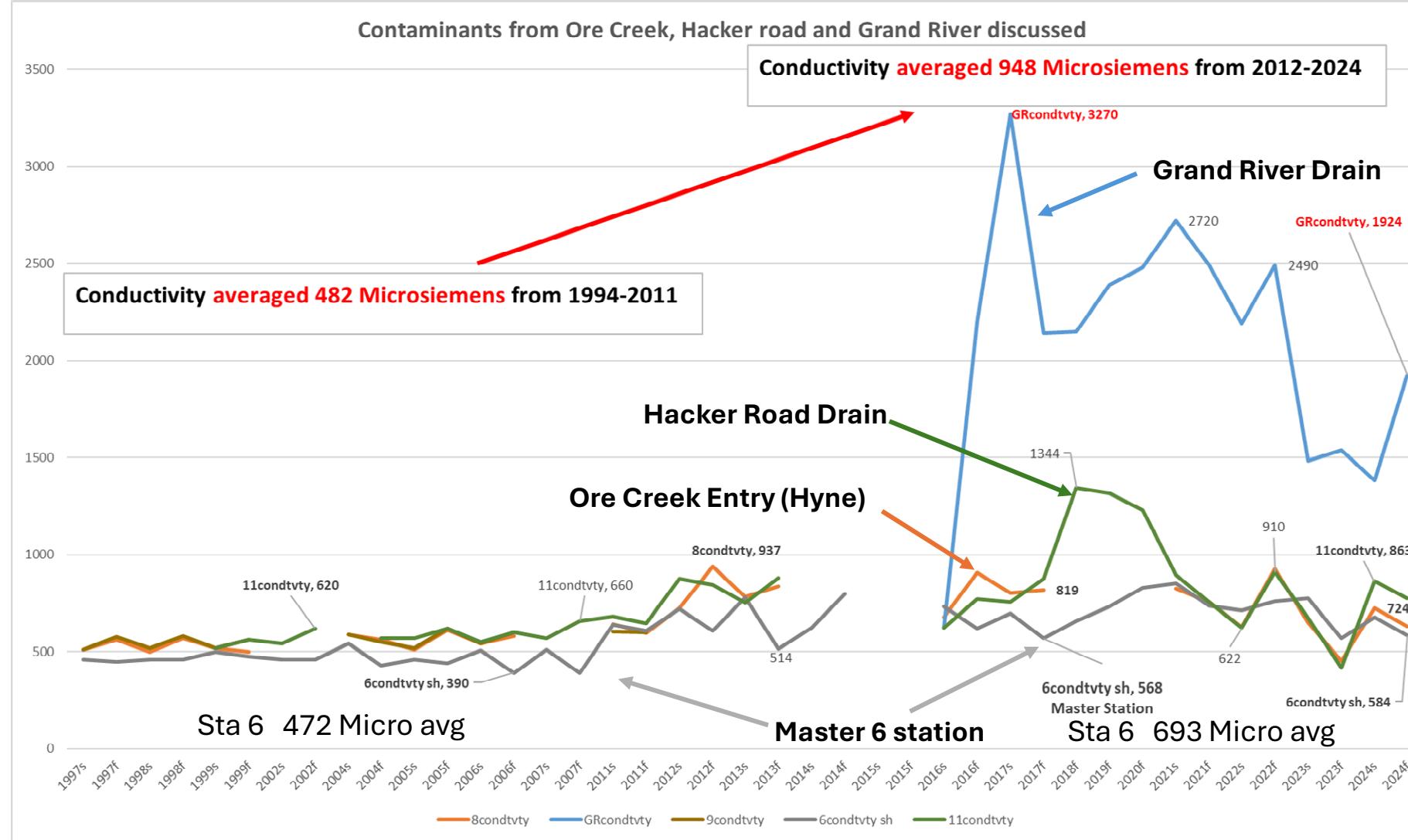
Station Number	Description
1	Near bridge on N end of main basin GPS: 42 33.603 83 47.394
2	W side of main basin; near Grand River Drain GPS: 42 33.406 83 47.400
3	Near dam on W shore of lake GPS: 42 33.070 83 47.044
4	E of Owo's Island along shore GPS: 42 33.403 83 47.035
5	NE of Wita's Island GPS: 42 33.434 83 46.718
6 Deep station - ca. 35 ft	W of public access GPS: 42 33.159 83 46.470
7	Far E side of lake; Hunter Bay GPS: 42 33.264 83 46.143
8	Far N, E fork near outlet of Ore Creek GPS: 42 43.113 83 47.382
9	E of Ore Creek Island GPS: 42 33.965 83 47.458
10	W side of lake, N of dam GPS: 42 33.097 83 47.244
11	Far N side of lake; west fork near Hacker Rd GPS: 42 33.097 83 47.244

Woodland Lake Contour Areas and Volumes	Acre Feet
Lake Area = 309.45 acres	1290
Islands = 3.99 acres	718
Surface area = 305.46 acres	215
5 feet = 210.43 acres	40
10 feet = 76.82 acres	52
15 feet = 9.57 acres	10
20 feet = 6.45 acres	
30-38 feet = 3.92 acres	
Lake volume (acre feet)	2326



- 2/year sampling
- Water temperature
- Dissolved Oxygen
- Conductivity
- Chlorides
- Phosphorous
- Nitrogen
- Ammonia
- Algae

Standardized sampling at defined locations since 1994, with Limnologists. David Jude Currently, U of M 11 stations, including 3 main roadways drains emptying into our lake. Woodland is a 305 acre lake, with a 7.5 foot average depth. Not very forgiving for contamination



Increasing conductivity from more Nitrogen/Calcium/Phosphorous input into lake. Indication of Contamination levels

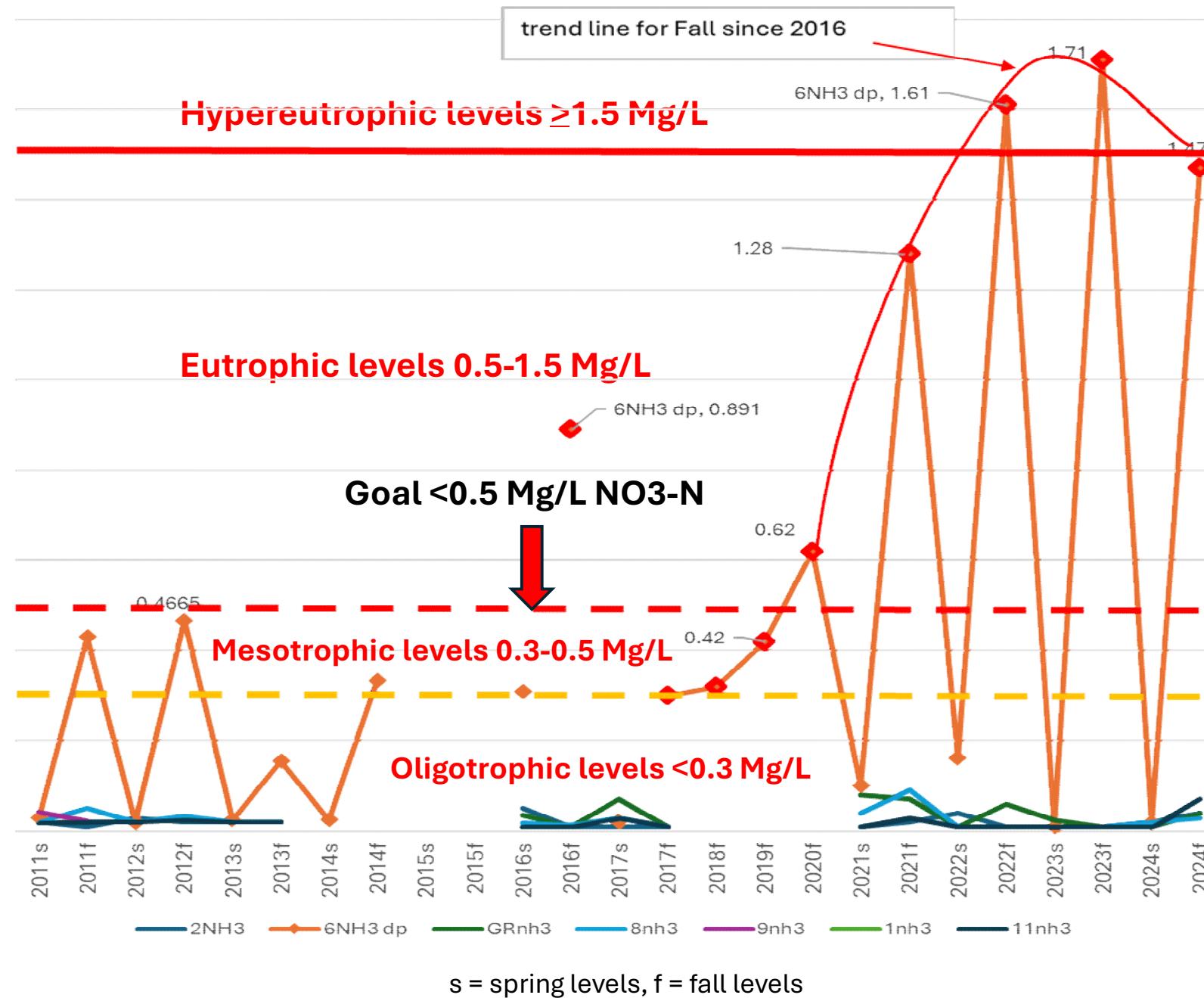
Higher impervious surfaces in drain fields around the lake plus boat churn, per Limnologists.

=> poor clarity, algae blooms and low oxygen for aquatic life

=> rise in Conductivity coincides with increased contaminations from drains around the lake

Conductivity goal for Woodland Lake is 500 Microsiemens

## Ammonia over time across WL



-No O<sub>2</sub> for aquatic life  
 -Hypereutrophic lakes are extremely difficult to restore

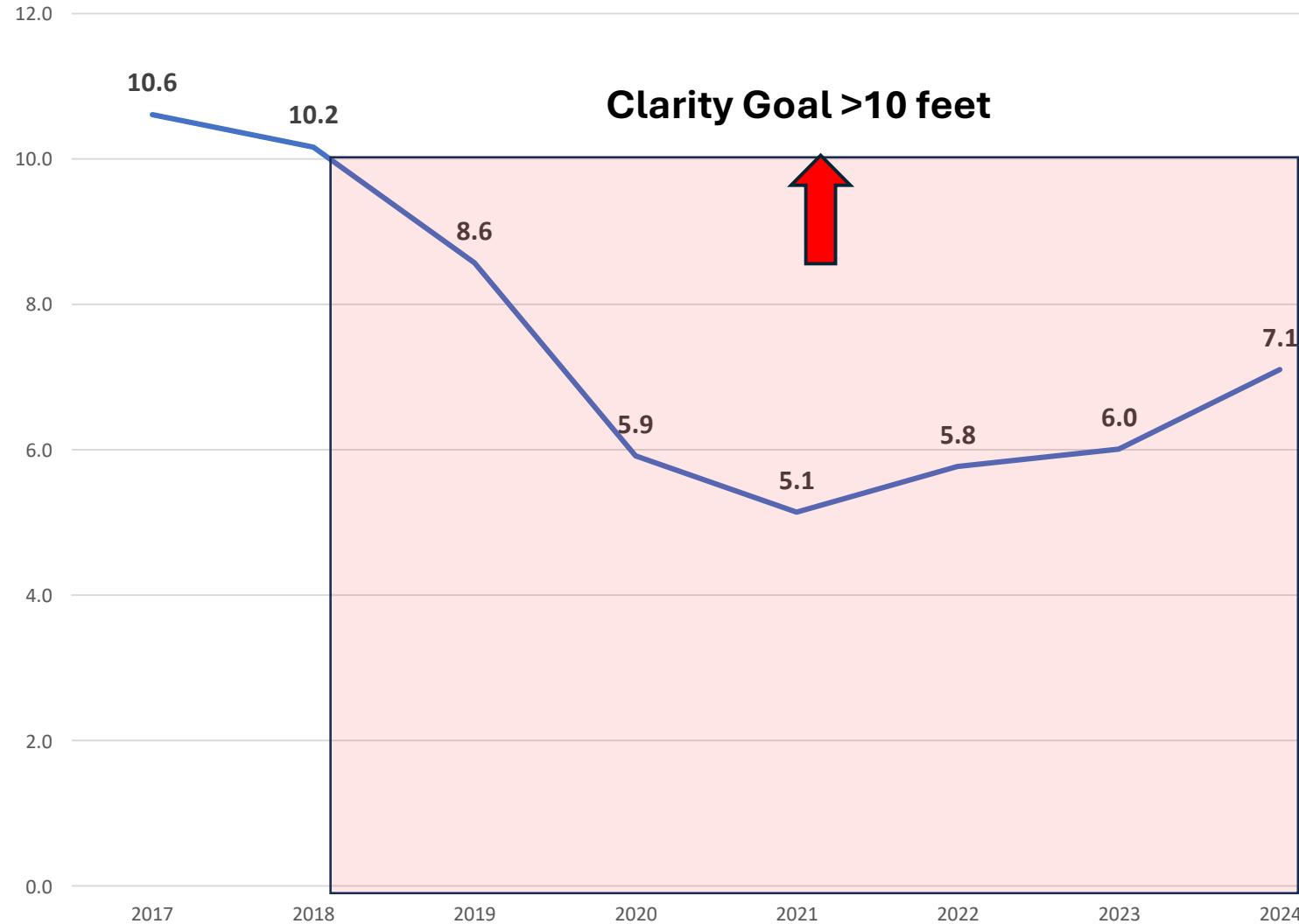
-weed growth and frequent algae  
 -oxygen low in the shallow spots.

**Station 6 is our Master station**

**Woodland Lake nutrient and contaminants exceed the lake's natural filtration capacity since 2012.**

**This timing coincides with the increasing contamination seen from the drains**

### Average Secchi reading Station 6



Water Clarity across the lake has dropped significantly from 2017 levels (avg over each yr)

R\*\*2 correlation of 0.57 water clarity to Conductivity

Coincident with increased drain contamination

#### Improvements:

2023 Phoslock

2024-25 Timber Char

2025, slight improvement, still significantly inadequate for water clarity



# Basic Lake Management



## Urbanization

Michigan has experienced intense residential and commercial development pressure in the last twenty years.

Loss of vegetative cover, increased impervious surface ratio area and the commensurate increased recreational use remain a threat to many of Michigan's lakes and streams.



We have overbuilt Woodland Lake, much the same as many lakes in Michigan and across the U.S.A that are having similar struggles

Michigan Lake and stream, USGS, DNR, EPA, MSU and other sources define high levels of impervious surfaces, instead of vegetation and wetlands, are the key issue in the reduced inland lake water quality

Our data supports this phenomenon

**How do we minimize damage to the lake's water quality from the proposed development?**

Impervious surfaces refer to **roads, parking lots, driveways, roofing, brick, stone, walkways and patios**.

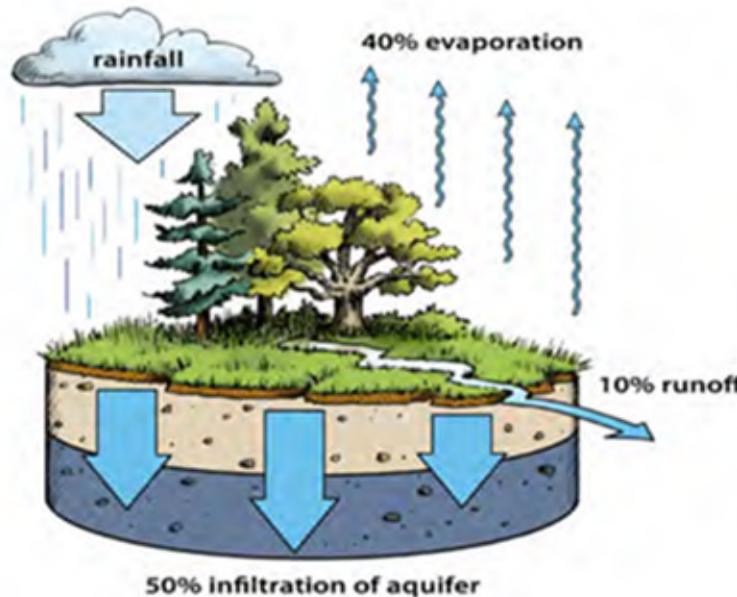
Nutrients and contaminants flow **too quickly to be absorbed, significantly impacting water quality**

**Sensitive Streams and Lakes** have watersheds that are below a **10%** impervious cover. Impacts are generally **minor** and the water quality and habitat is **good to excellent**

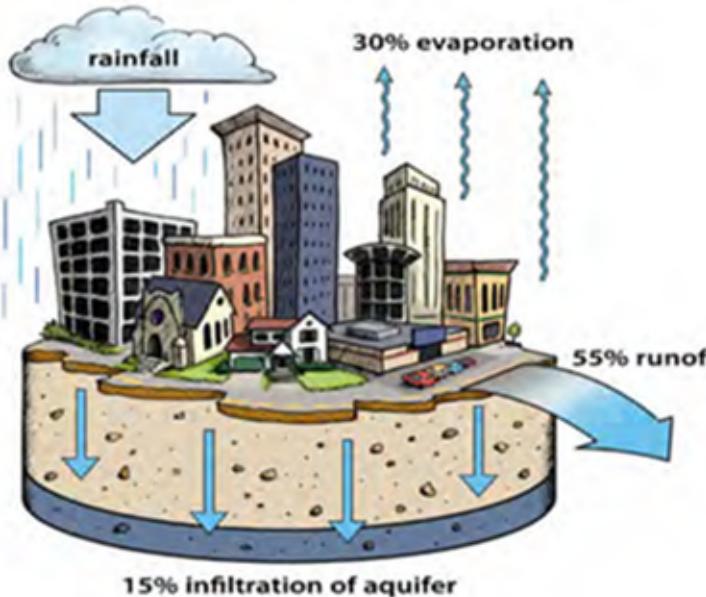
**Impacted Streams and lakes** have **water quality and habitat impairments**. These are found in watersheds **between 10 and 25%** impervious cover

**Non-supporting streams and lakes** have **severe water quality and habitat degradation** in watersheds with **over 25%** impervious cover, The **impacts are so significant** that they are not considered suitable for restoration

Center for Watershed Protection, supported by over 200 studies



Vegetation and forestation



75% impervious surface

**The total impervious surface goal for developments around lakes is 15%, with protections.**

(USGS, MSU, Michigan Lakes and streams, Delaware water resource agency, etc...)

**Master plan includes maximums for road length and lot coverage, minimum for lot size and setbacks to help**

	Percent impervious	Percent going to runoff (C)
Curr	10%	10%
	15%	15%
	20%	20%
	35%	30%
PUD/R2 prop	50%	45%
	75%	55%



## Recommendations

### Storm Water Management

Increased development activity places additional burden on existing natural drainage systems. The overtaxing of drainage systems leads to localized flooding, environmental damage and costly storm drainage improvements to be borne by taxpayers. Storm water drainage can be managed by installation and improvements to storm water drainage systems and by requiring on-site detention of storm water, which Brighton Township currently does. Another way to manage storm water is through preservation of natural drainage ways and providing onsite storm water detention with controlled discharge. Through these approaches, the impact of development on drainage systems can be minimized.

Acknowledging that some impacts must be anticipated, a comprehensive approach to storm water management using Low Impact Design recommendations is encouraged. These types of measures will be much more effective in pre-treatment of storm water before it enters the ground or surface waters. Storm water protection can be achieved through many of the other recommendations in this chapter. Some additional policies not discussed include:

- Private road standards should allow shorter streets to reduce the amount of pervious coverage. Narrower roads may be considered if allowed by the Brighton Area Fire Authority.
- Minimize use of long cul-de-sacs in favor of connected street patterns.
- Encourage clustering of homes to minimize total impervious area, reduce total construction costs, conserve natural areas, provide community recreational space, and promote watershed protection.
- Promote more flexible design standards for residential subdivision sidewalks. Where practical, consider locating sidewalks on one side of the street and providing common walkways linking pedestrian areas.
- Minimize clearing and grading of forests and native vegetation, except where necessary to accommodate development.
- Conserve vegetation by clustering tree areas, promoting the use of native plants, and planting additional vegetation.

## What does master plan tell us to do?

Private road standards should allow shorter streets to reduce the amount of impervious coverage

Minimize total impervious area. Conserve natural areas, provide community recreational space

Minimize clearing and grading of forests and native vegetation

Conserve vegetation by clustering tree areas, promoting the use of native plants and planting additional vegetation

## Watershed Planning

A more regional approach to conservation includes watershed planning. Watersheds and the sub-basins within them can be identified using GIS mapping technology that considers topography to locate changes in drainage direction and establish the watershed boundary. Studies have shown that over-development, typically defined as over 10% impervious coverage, within a given sub-basin or watershed can contribute to overall water quality degradation. By requiring minimum vegetated buffers, maintaining riparian corridors, and limiting impervious surface coverage can all help mitigate the impacts of development. Often implemented in a coordinated approach with neighboring communities, protection of watersheds must include all municipalities that regulate any portion of a given watershed and, therefore, requires the Township to pursue local relationships with their municipal neighbors. Additional research to establish watershed and sub-watershed boundaries and existing natural vegetation along surface water resources is needed to accomplish this objective.

## Protection of Lakes

Protecting the integrity of the local lakes is vital to maintaining the current quality of life in Brighton Township. Most lakes are surrounded by residential development, which means that impacts to those lakes will also affect the residents that live there. These impacts can be both ecological and recreational, as overpopulation of the lakes can contribute to water quality degradation. Various lake associations are active in preservation efforts, including participation in an on-going water quality monitoring program. The testing program involves volunteers from various homeowner associations to collect water samples and submit them to a biologist who prepares detailed analysis and reports.

## What does master plan tell us to do?

Studies have shown that over-development, typically defined as over 10% impervious can contribute to overall quality degradation

By requiring minimum vegetated buffers, maintaining riparian corridors and limiting impervious surface coverage can all help mitigate the impacts of development

Protecting the integrity of local lakes is vital to maintaining the current quality of life in Brighton Township

- 1.) How is this development doing versus our Master Plan teachings and requirements?**
- 2.) How does the current product look compared to our goal of protecting the environment and our citizens?**

## TABLE OF DEVIATIONS – R-2 TO PUD

CURRENT ZONING: R-2  
PROPOSED ZONING: PUD

MINIMUM LOT SIZE R-2 ZONING:	40,000 S.F.
MINIMUM LOT SIZE PROPOSED PUD:	16,000 S.F.
DEVIATION:	24,000 S.F.

MINIMUM SETBACKS R-2 ZONING:	FRONT 35 FT SIDE 12 FT REAR 35 FT
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MINIMUM SETBACKS PROPOSED PUD:	FRONT 25 FT SIDE 10 FT REAR 30 FT
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DEVIATION:	FRONT 10 FT SIDE 2 FT REAR 5 FT
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RIGHT-OF-WAY REQUIRED:	66 FT
RIGHT-OF-WAY PROPOSED:	50 FT
DEVIATION:	16 FT

MAXIMUM ROAD LENGTH ALLOWED:	750 FT
MAXIMUM ROAD LENGTH PROPOSED:	2,888 FT (WITH EMERGENCY ACCESS)
DEVIATION:	2,138 FT

MINIMUM ROAD WIDTH ALLOWED:	30' B/C-B/C
MINIMUM ROAD WIDTH PROPOSED:	28' B/C-B/C
DEVIATION:	2 FT

MAXIMUM LOTS ON A PRIVATE ROAD WITH A SINGLE POINT OF ACCESS:	24
NUMBER OF LOTS PROPOSED ON A PRIVATE ROAD WITH A SINGLE POINT OF ACCESS:	40
DEVIATION:	16

MAXIMUM LOT COVERAGE (%) R-2 ZONING:	15%
MAXIMUM LOT COVERAGE (%) PROPOSED:	40%
DEVIATION:	25%

SINCE THE SITE IS ENTIRELY WOODED, NO TREE SURVEY OR NATURAL FEATURES PLAN WILL BE PROVIDED. GRADING AND TREE REMOVAL WILL BE LIMITED TO THOSE AREAS NECESSARY TO BUILD THE ROAD AND INSTALL UTILITIES. NO TREE REPLACEMENT IS PROPOSED.

MINIMUM LAKE SETBACK PER PUD ORDINANCE:	100 FT
MINIMUM LAKE SETBACK PROPOSED (SINGLE FAMILY HOME):	100 FT
MINIMUM LAKE SETBACK PROPOSED (DETACHED CONDO):	50 FT

## OVERALL SITE MAP

NO SCALE

Note: The **Baseline plan** proposed has **3,400** feet of road length. **4.5X master plan rqmts.**

- Smaller lots drive higher impervious surfaces
- ~4x length of roadway maximum drives excessive impervious surface
- 750 foot of roadway = 9.375 lots. +30% => **12.2 lots, not 40**
- Shorter roads => less acreage for stormwater accumulation
- More people add tire wear, fluids, exhaust and total pollution
- More lots drive higher impervious surfaces and flows

- Many states are pushing **10-15%** maximum total impervious surfaces for lots near waterways to address the pollution problem across our country

Many states are moving to larger setbacks to enable buffer zones to help protect inland waterways

These PUD deviations are **hugely detrimental to flooding and lake contamination, violate Master Plan requirements**

Seems we are squeezing every residence in possible, not trying to protect our lakes per Master Plan guidance

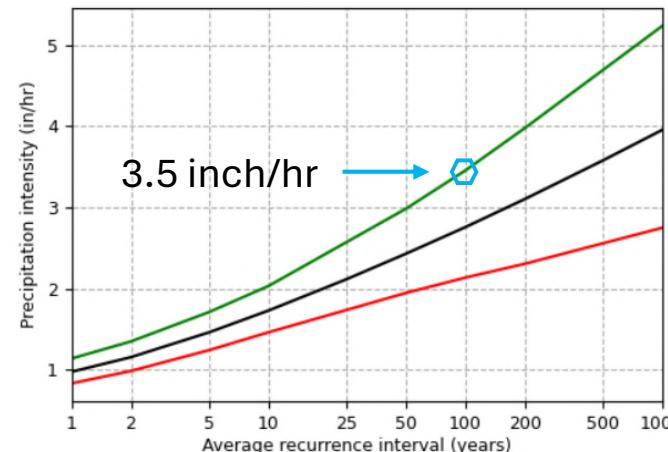
Curves

PF estimates with confidence intervals

Duration:

- 5-min
- 10-min
- 15-min
- 30-min
- 60-min
- 2-hr
- 3-hr
- 6-hr
- 12-hr
- 24-hr
- 3-day
- 4-day
- 7-day
- 10-day
- 20-day
- 30-day
- 45-day
- 60-day

60-min PF estimates with 90% confidence intervals  
Latitude: 42.5852°, Longitude: -83.7408°



NOAA Atlas 14, Volume 8, Version 2

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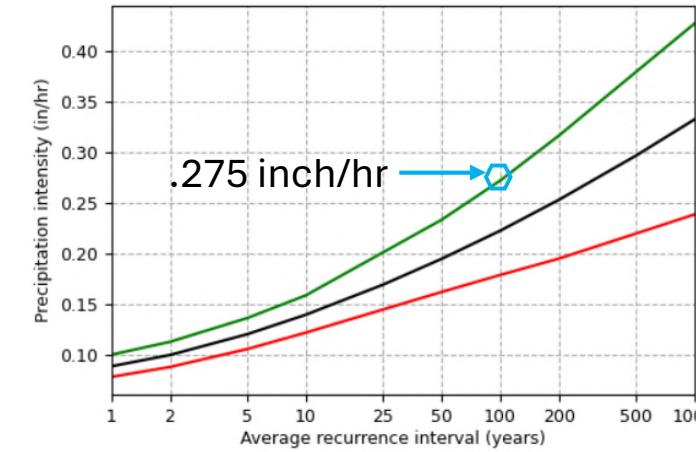
Curves

PF estimates with confidence intervals

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- 5-min
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- 6-hr
- 12-hr
- 24-hr
- 2-day
- 3-day
- 4-day
- 7-day
- 10-day
- 20-day
- 30-day
- 45-day
- 60-day

24-hr PF estimates with 90% confidence intervals  
Latitude: 42.5852°, Longitude: -83.7408°



NOAA Atlas 14, Volume 8, Version 2

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EGLE references NOAA for rain intensity charts for regions of development

NOAA 100 year rain events, to be protected for up to a 24 hour event, include:

**1 hour at 3.5 inches/hour and**

**24 hours at .275 inches/hour ( 6.6 inches per day)**

1 inch of rain over 1 acre of earth equals **27,164** gallons of water. Must protect for 100 year rain, 1 hour through 24 hours.

**Flow calculations for the Stormwater Mgmt Rational Model:**

**Runoff flow Gallons/hr = Area in acres \* Weighted C Factor \* Inches rain/hr \* 27,164 gallons/inch/acre**

# PUD proposed, with Hypothetical density example

# Original R2 proposed

		Current				Hypothetical, PUD layout estimation with lots at 0.15 Impervious				PUD				R2 original baseline			
		Acres	Imp Rating	Net C Factor	Flow to be protected	Imp Rating	Net C Factor	Flow to be protected	Imp Rating	Net C Factor	Flow to be protected	Acres	Imp Rating	Net C Factor	Flow to be protected		
Wetland Discharge pretreat	1.71		0.1	16,252	gals/hr	0.36	58,687	gals/hr	0.51	83,064	gals/hr	East Detention	2.55	0.48	116,993	gals/hr	
Impervious Acres	0.76		0.1			0.56		0.9				Impervious Acres	1.03	0.9			
Pervious acres	0.95		0.1	30,646	gals/day	0.20	110,666	gals/day	0.2	156,635	gals/day	Pervious acres	1.52	0.2	220,615	gals/day	
East Sedimentation	2.2		0.1	21,004	gals/hr	0.39	80,593	gals/hr	0.56	116,518	gals/hr	West Retention Basin	7.83	0.36	264,589	gals/hr	
Impervious Acres	1.12		0.1			0.56		0.9				Impervious Acres	1.74	0.9			
Pervious acres	1.09		0.1	39,607	gals/day	0.20	151,976	gals/day	0.2	219,719	gals/day	Pervious acres	6.09	0.2	498,938	gals/day	
Retention Basin	16.35		0.1	155,389	gals/hr	0.32	503,707	gals/hr	0.44	683,330	gals/hr	Wetland Pretreatment	1.83	0.50	86,676	gals/hr	
Impervious Acres	5.6		0.1			0.56		0.9				Impervious Acres	0.78	0.9			
Pervious acres	10.75		0.1	293,019	gals/day	0.20	949,847	gals/day	0.2	1,288,566	gals/day	Pervious acres	1.05	0.2	163,445	gals/day	
		Gallons/Hr				Gallons/Hr				Gallons/Hr				Gallons/Hr			
Total Gallons to treat per hour		192,644				642,986				882,912				Gallons/Hr			
		Gallons/day				Gallons/day				Gallons/day				Gallons/day			
Total Gallons/24 hours		363,272				1,212,489				1,664,920				Gallons/day			
Runoff Coefficient	20 acres.	C	0.10			C	0.33		C	0.46		Total Gallons to treat per hour		932,333			
		Goal				C	0.2-0.25					Total Gallons/24 hours		1,758,113			
												Runoff Coefficient	25 acres	C	0.41		

The **PUD deviations** mentioned earlier drive a **C factor of 0.46 (1.66M gals/day runoff across 20.3 acres)**

**Current baseline R2 C factor is 0.41**, in large part due to **Roadway length deviation ( =>1.8M gals/d runoff across 25 acres)**

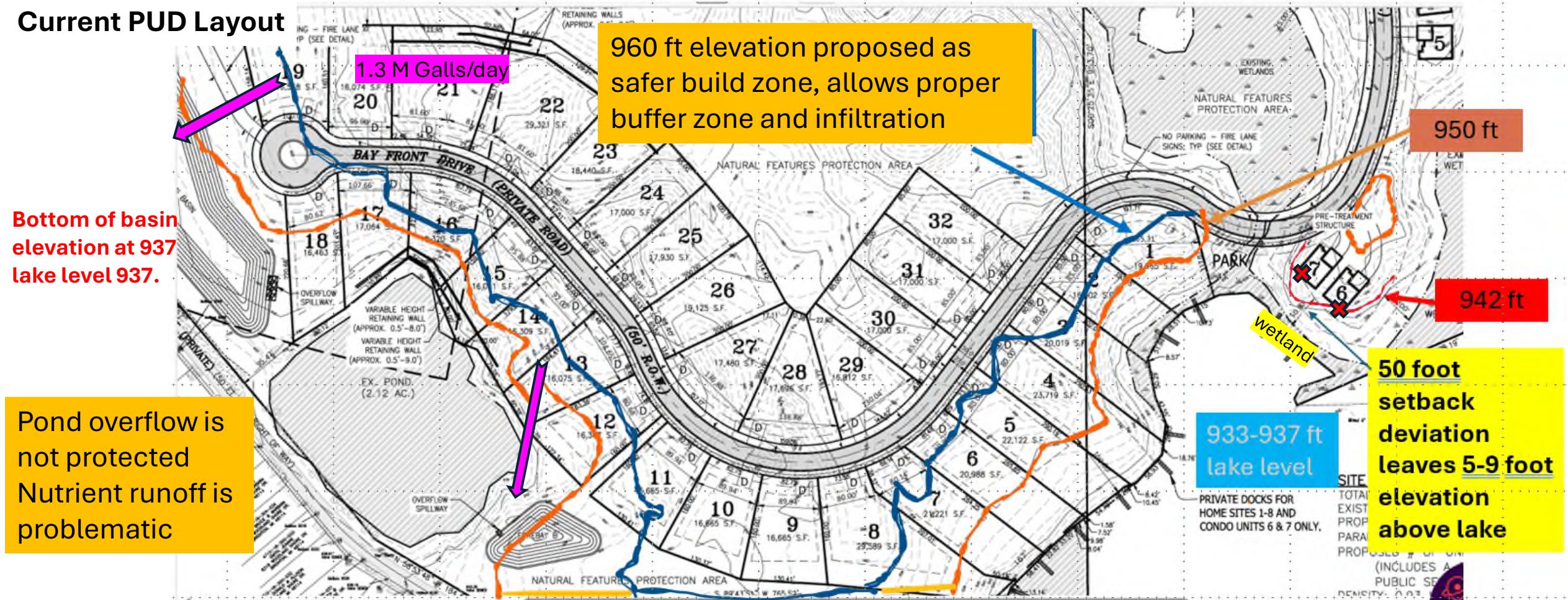
**A hypothetical PUD, modified only for lot density, allowing road length deviation, yields C factor of 0.33. =>1.2M gallons/day runoff.**

**Numerous studies indicate that the highest level of impervious surface that can be mitigated for nutrient contamination is 0.25**

**750 ft road, 160 ft lot width => 9.375 lots, +30% = 12.2 lots Master Plan, not 40 or 31. Land division = 11-13 lots, REU's were 16 lots.**

**B.T. Master Plan had the intent of protecting our natural features, so why are we at this point?**

## Current PUD Layout



Steep Elevations, 20-80 feet across entire build plan will require extensive work to protect our lake in construction and through full occupancy.

High Density (46% runoff over 20 acres, too many) impervious cover is unacceptable for lakefront, particularly a troubled one

Vegetation buffer zones (engineered) are a great aid to retention and detention ponds. Environmental Engineering necessary

No room for vegetation buffers, swales and adequate retention and nutrient management in this layout

931 elevation to base  
West retention basin

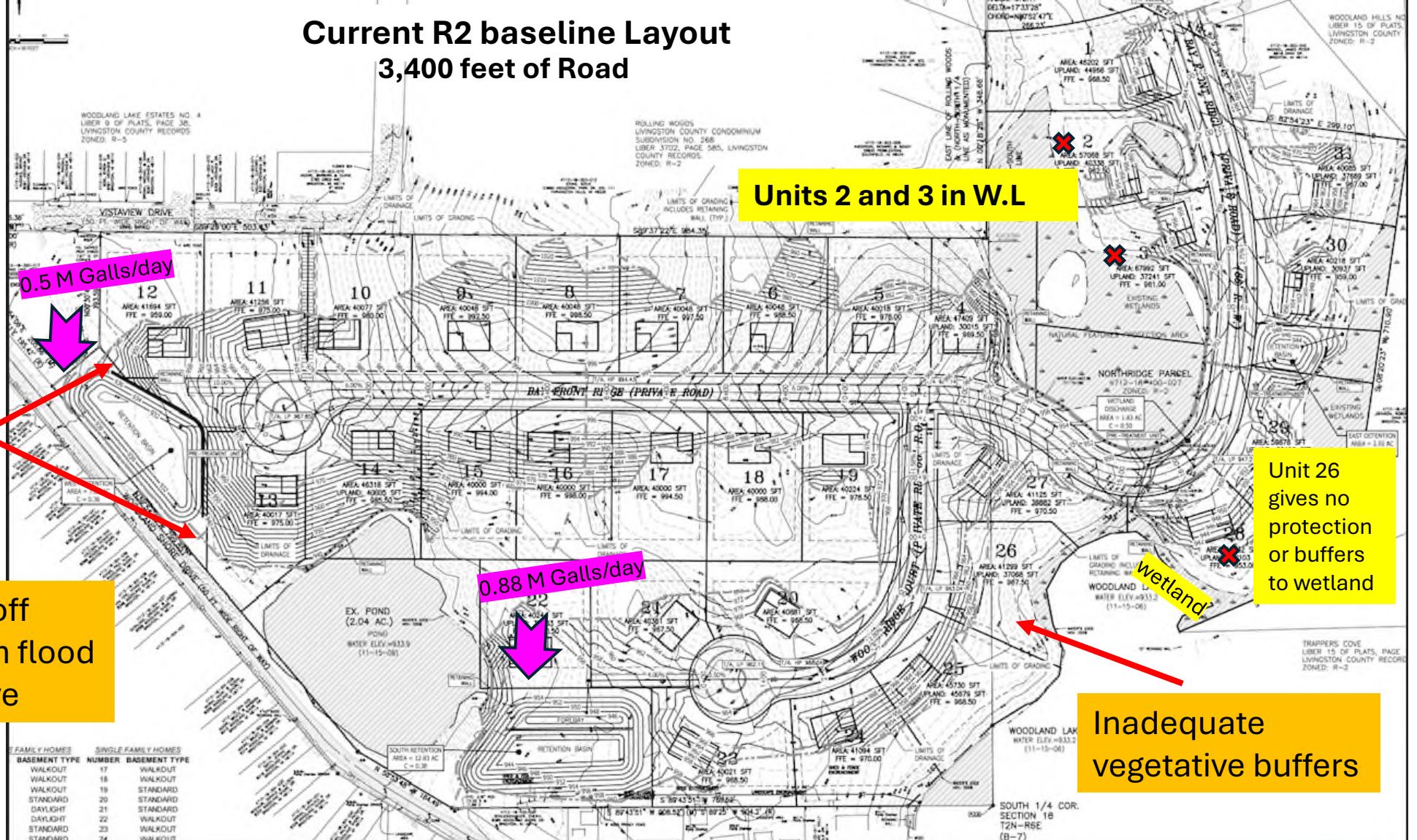
945 elevation for  
south retention basin

**933-937 lake level**

## Inadequate vegetative buffers

1.38 M gallons/Day runoff  
Pond not protected from flood  
Nutrient runoff excessive

## Current R2 baseline Layout 3,400 feet of Road

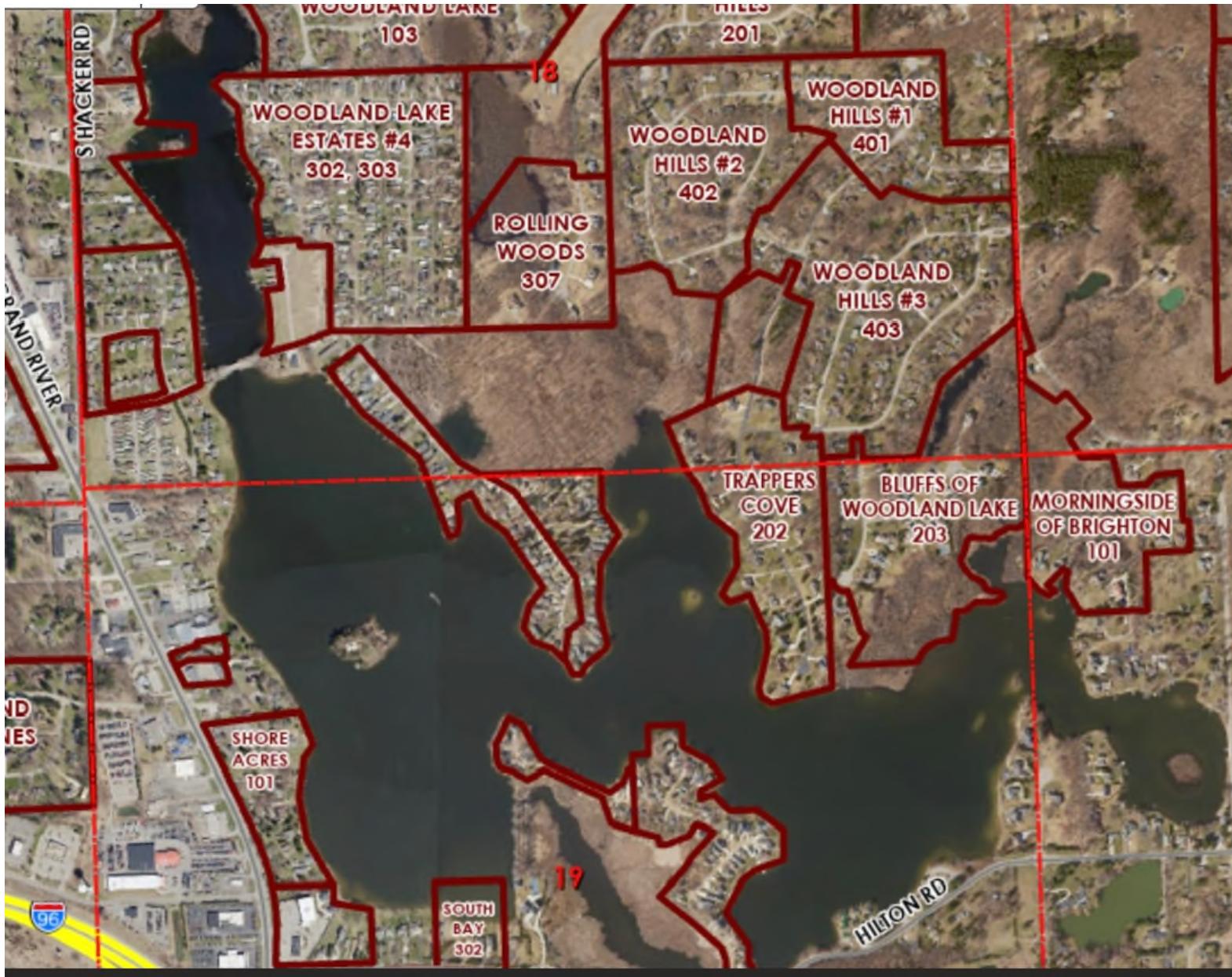


**R2 Baseline as currently designed does not protect our lake, or the pond from flooding. Too much flow for nutrient absorption**

Excessive impervious factor (41% runoff over 25 acres, too many). Over 4.5 times the road length that the master plan specified

## Inadequate room for vegetative buffer zones, inadequate retention and forebay systems

A good approach, combined with modifications, could drive responsible development for proposed area



Planning Committee did a nice job of protecting the **Woodland Bluffs** Wetlands 25 years ago.

Built between **25 to 35 feet** above lake level, with **vegetative buffer zone** and **wetlands** to filter runoff. Good concept, plus we **know more now** about impervious surfaces and **stormwater management**

**The only remaining large area of wetlands and vegetation left around our lake to take up nutrients is where the new PUD development is planned**

**Township Master Plan including any sub area or corridor studies. If conditions have changed since the last Master Plan was adopted, the consistency with recent development trends in the area.**

This project is located in the low-density residential area of the future land use map which is typically the R-1 and R-2 zoning districts. These areas are designated for single-family residences, located between the rural residential and more urbanized areas of the Township. This designation encompasses the majority of land planned for future residential use, and generally includes areas that do not have access to municipal water and sewer. Many areas have already been developed where fewer environmental constraints are found. However, the land immediately surrounding many of the lakes is designated for residential land uses. These areas will need to be monitored to ensure the environmental integrity is maintained and water quality remains satisfactory. The primary type of development within this classification is expected to be single-family residences on lots that are roughly one acre in size.

11/10/25  
minutes  
package

**Many studies, along with the Brighton Township Master Plan, indicate that impervious surfaces above 10% have negative implications for lake water quality. What do we do when we realize we haven't maintained environmental integrity after it's all built?**

**Further studies, and the basis for OWL's request, are that the highest levels of impervious surfaces that can be mitigated for water quality is 25%, with a good deal of engineering work for mitigation.**

**Both of these R2 and PUD proposals are above 40% and will definitely impact our water quality. Need to fix this before it's built**

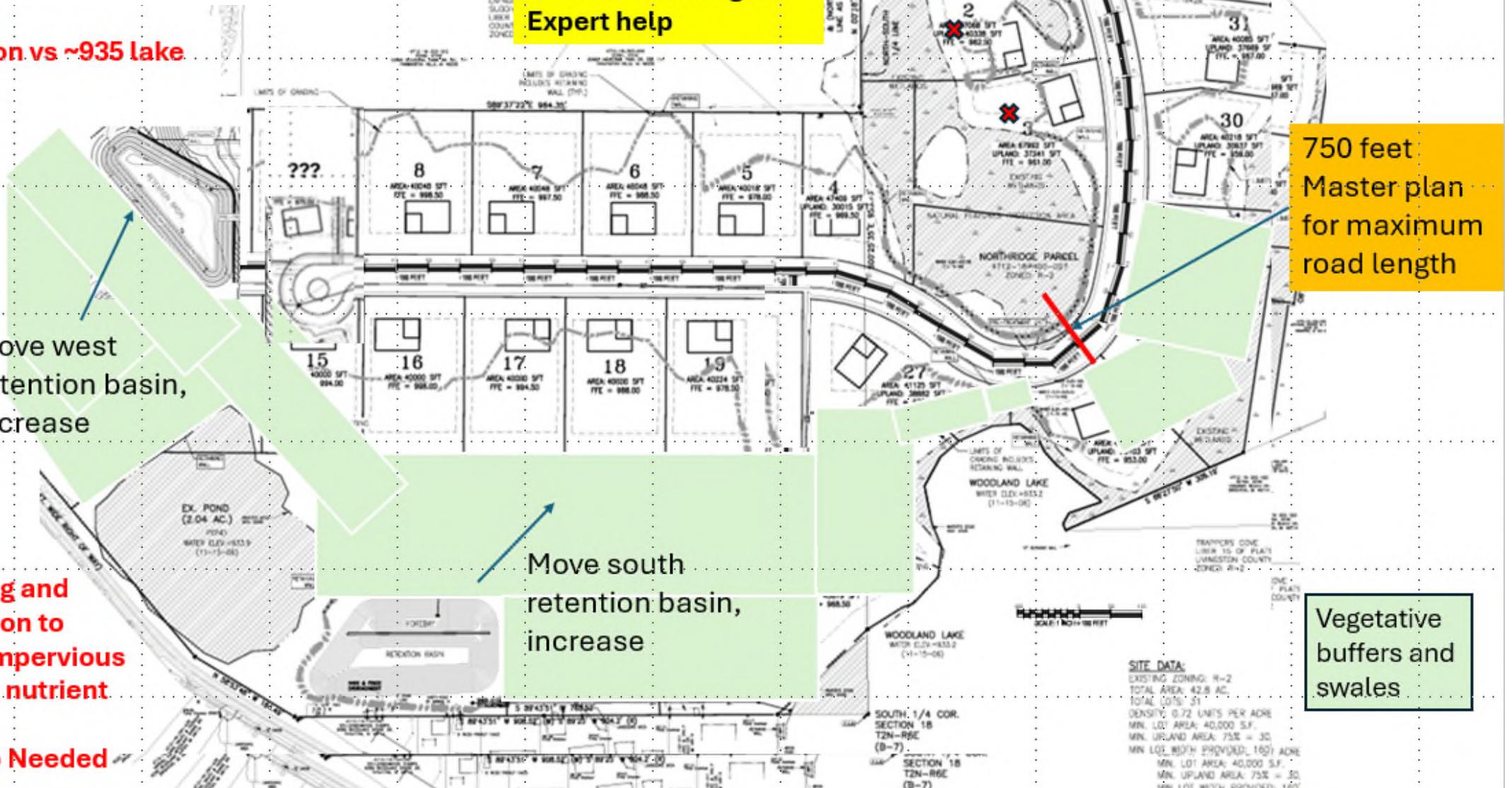
OWL proposed strawman  
compromise

~1450-1800 feet road, Ballpark

960 ft elevation vs ~935 lake

R2 Modified strawman

Units 2 and 3 in W.L.  
Doesn't seem right?  
Expert help



## **Summary Discussion of concerns from Woodland Lake riparians:**

Woodland lake riparians have been battling excessive nutrients coming into the lake and not enough natural filtration

This is a common phenomenon around the country. Numerous studies show overbuilding as the primary cause

Woodland Lake riparians have spent over \$350K over the past 2 years trying to turn the tide. Next steps are \$ Millions. Ozone

Numerous studies show maximum level of impervious surface that can be mitigated is C of 25% , with enviro engrg.

The Master plan's R2 includes Maximum lot density, Minimum Lot size, setbacks and Max Road length to protect Natural features

PUD (C=0.46) deviations ask for 40% lot size, 250% build density and 4 times roadway length. =>1.66M gals/Day runoff

Initial Baseline R2 (C=0.41) deviations include over 4.5 times roadway length. => 1.76M gals/Day of runoff

Neither proposal is acceptable for near shore application. Runoff flows will drive flooding and minimal plant filtration

Land elevation drives risk from deforestation, through build and through years of occupancy with safety factors. Must manage

Safety factors for flooding and contamination must account for increasing levels of rain and Riparian increased contamination risks over time. (100 year rains, Vehicles, boats, fertilizer, decks/patios added, sedimentation settling, etc)

Build to R2 Master plan with much smaller deviations from Master Plan. Current deviations are irresponsible for water quality

**Recommend develop to C of 0.15-0.25, with Environmental Engineering to ensure safety for flooding and nutrient filtration buffer**

**Back up  
information**

Stormwater management has 2 requirements when protecting an inland lake

A.) manage flooding and first flush of rain

B.) Manage nutrient carryover to inland lake, focus on Nitrogen, Phosphorous and Chlorides.

	C factor for runoff driven by development design/slope and soil types					
	Current 0.1	0.15	0.25	Hypo 0.33	R2 Baseline 0.41	PUD 0.46
Runoff Volume Max/Day	363K, Filtered	544K Gals/Day	0.9M Gals/day	1.2M Gals/Day	1.66M gals/day	1.8M Gals/Day
Filtration	Forested, each tree absorbs 10-150 g/d	Less Forestation				Highest flow rates to filter
Wetlands	Ea Acre absorbs 17 lb N & 100 lb Phos/day	Impacted Wetlands + medium flows	Impacted Wetlands + med-High flows	Impacted Wetlands + High flows	Impacted Wetlands + High flows	Impacted Wetlands + High flows
N with precip	20 lbs/yr. Filtered		Filtration all nutrients capacity reduced significantly with flow			
Fertilizers	No fertilizers		Fertilizer risks increase with number of residences			
Vehicle exh/Nox/Tire wear/fluids	No vehicles, no added boats		Vehicle contamination increases with number of residences			
P, Weathering Rocks/Concrete	Low Phos added, Filtered in plants	Phosphorous loading from road/sidewalks/driveways		increases with road length and residences		
P, Septic/pets/ lawn clippings	None	Phosphorous loading from pets/lawn clippings/leaves incr with residences. must be a given			No Septic	
Chlorides	No Chlorides		Chlorides increase with road, sidewalk and driveway salting			

## Master plan calls for R2 designation for this area

15% build density

Maximum road length of 750 feet

R2 requires minimum width of 160 feet and 40,000 square foot lots minimum

This yields:

750 ft of road/160 feet lot = 4.6875 lots on each side of the road

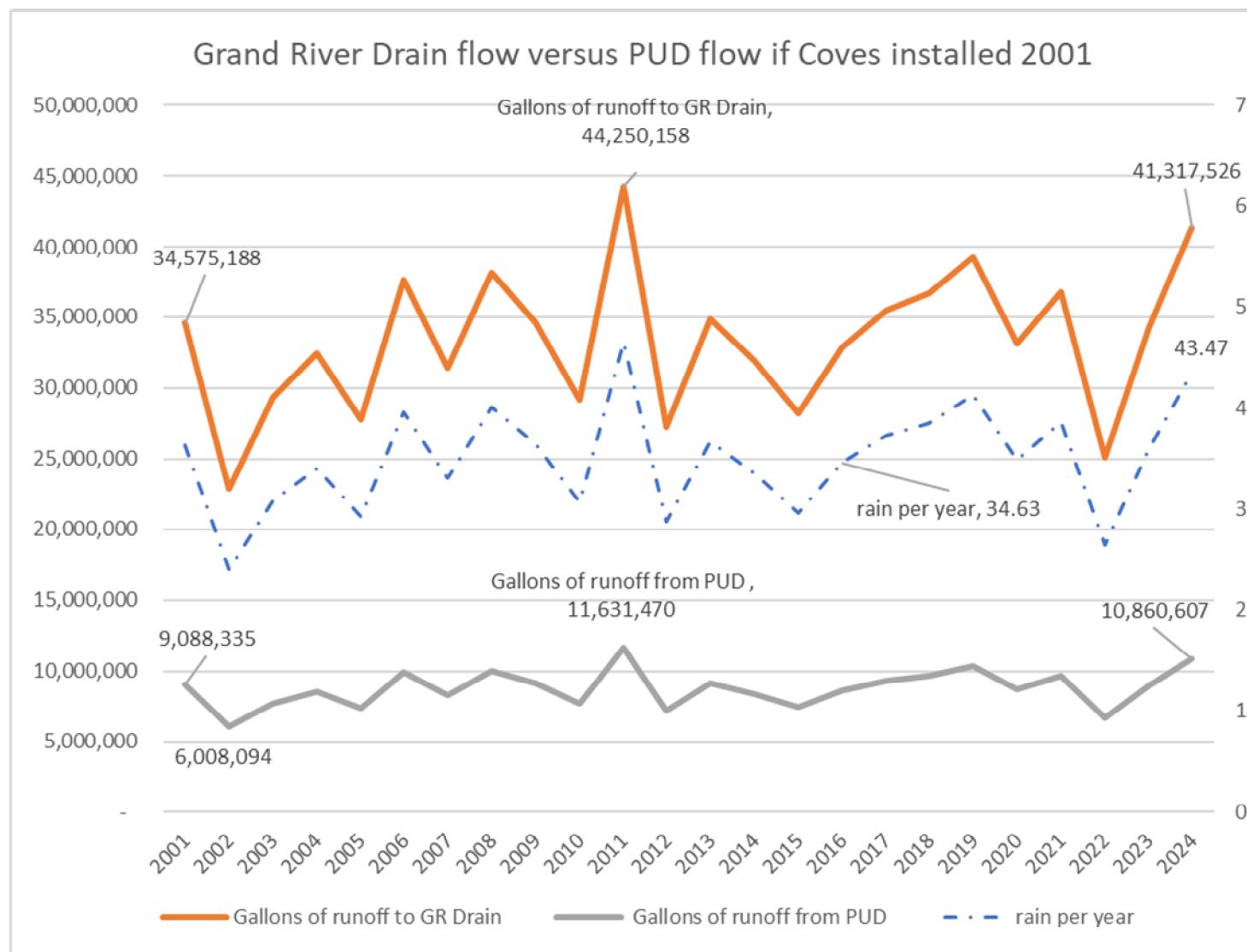
⇒ **9.375** lots in total, per master plan

⇒ With 30% bonus factor for public sewer and public water, this yields  $9.375 \times 1.30 = \mathbf{12.1875 \text{ lots}}$

⇒ By increasing the size of lots, particularly behind the homes (Driveway), can reduce C factor

⇒ Build on 960 foot elevation to enable adequate infiltration and

⇒ Engineer net 0 impacts to flooding and nutrients through oversizing basins, vegetation



Due to its highly impervious surfaces, the proposed PUD would generate  $\frac{1}{4}$  the runoff flow that we have seen from the Grand River Drain over this time. Very significant negative inputs to our lake

Grand river Drain is 70 acres, over 50% impervious, up to 90 feet elevation to lake  
 PUD plan is 20 Acres, 46% impervious, up to 80 feet in elevation

# Rational Method Runoff Coefficient Tables for Storm Water Runoff Calculation

Categories : Hydraulics in civil engineering Tags : Civil engineering

		Runoff Coefficient, C					
		Soil Group A		Soil Group B			
Slope :		< 2%	2-6%	> 6%	< 2%	2-6%	> 6%
Forest		0.08	0.11	0.14	0.10	0.14	0.18
Meadow		0.14	0.22	0.30	0.20	0.28	0.37
Pasture		0.15	0.25	0.37	0.23	0.34	0.45
Farmland		0.14	0.18	0.22	0.16	0.21	0.28
Res. 1 acre		0.22	0.26	0.29	0.24	0.28	0.34
Res. 1/2 acre		0.25	0.29	0.32	0.28	0.32	0.36
Res. 1/3 acre		0.28	0.32	0.35	0.30	0.35	0.39
Res. 1/4 acre		0.30	0.34	0.37	0.33	0.37	0.42
Res. 1/8 acre		0.33	0.37	0.40	0.35	0.39	0.44
Industrial		0.85	0.85	0.86	0.85	0.86	0.86
Commercial		0.88	0.88	0.89	0.89	0.89	0.89
Streets: ROW		0.76	0.77	0.79	0.80	0.82	0.84
Parking		0.95	0.96	0.97	0.95	0.96	0.97
Disturbed Area		0.65	0.67	0.69	0.66	0.68	0.70

C factor (Runoff) is dependent on soil, slope, Impervious density and materials used.

**C factor of 0.15, with mitigation** around lakes is healthy for new developments.

**0.15 is difficult**, but many studies demonstrate that **0.15 to 0.25, with protections, is achievable and necessary** around lakes

Reduced C levels must include **stormwater management systems** designed to **mitigate contamination** and **flooding**, from deforestation through years of occupancy

**Safety factors** must be incorporated due to **sediment loading** over time and account for **additional resident activities** -(exhaust, fertilizer, decks, patios, pets, etc..)

**Archived:** Monday, November 3, 2025 8:06:10 AM

**From:** [John Boland](#)

**Mail received time:** Sat, 1 Nov 2025 17:12:34

**Sent:** Saturday, November 1, 2025 1:12:35 PM

**To:** [Planner Manager](#)

**Cc:** [Cheryl Wasilewski](#) **cc:** [Tim Agnello](#) [Bill Loughead](#) [Doug Mancini](#) [Tim Happ](#) [Stan Lawrence](#) [Russ Ward](#) [John Guidobono](#) [Jim Kahut](#) [Doug Taylor](#) [Katie Tierney](#) [Lorrie Haydon](#) [Stuart Meyers](#) [Anita's Comcast](#)

**Subject:** Woodland Lake OWL presentation responses, regarding PUD deviation

**Importance:** Normal

**Sensitivity:** None

**Attachments:**

[PlanningResponseOc25.docx](#) 

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Hi Kelly.

Thank you for allowing me to present to your planning board. Please review the attached file for responses to questions that your panel had for us.

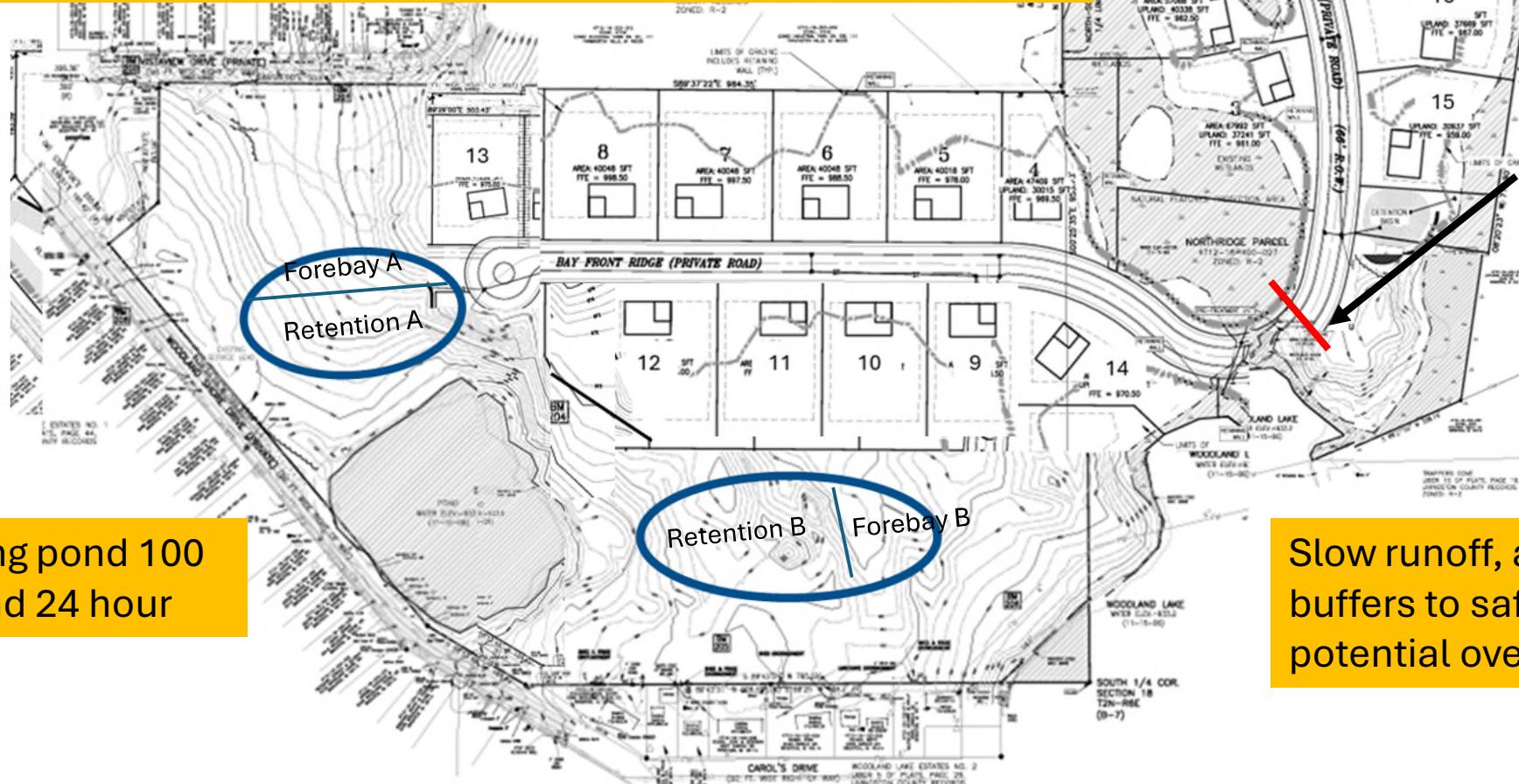
In addition, I have submitted a proposal that has been reviewed by the OWL team. The intent is to give an approach for achieving what can be built in this area, based on what other states have done in similar situations and similar to what was done for Woodland Bluffs. If the Land Division act applies here, this would handle the 13 residences readily and safely. If the act doesn't apply, it could be used as a framework, with Environmental Engineering assistance, for how to establish the best approach to protect our lake's water quality and still move forward with development.

Thank you

John

Current bottom of retention basins are between 931 and 945 feet above sea level

Lake at 935, need bottom of retention basins over ~942 to allow infiltration



Road length 750 max  
Lot sizes 40K sqft  
0.15 build density  
160 ft min width lot

Protect flooding pond 100  
year, 1 hour and 24 hour

Slow runoff, add vegetative buffers to safely filter any potential overflows

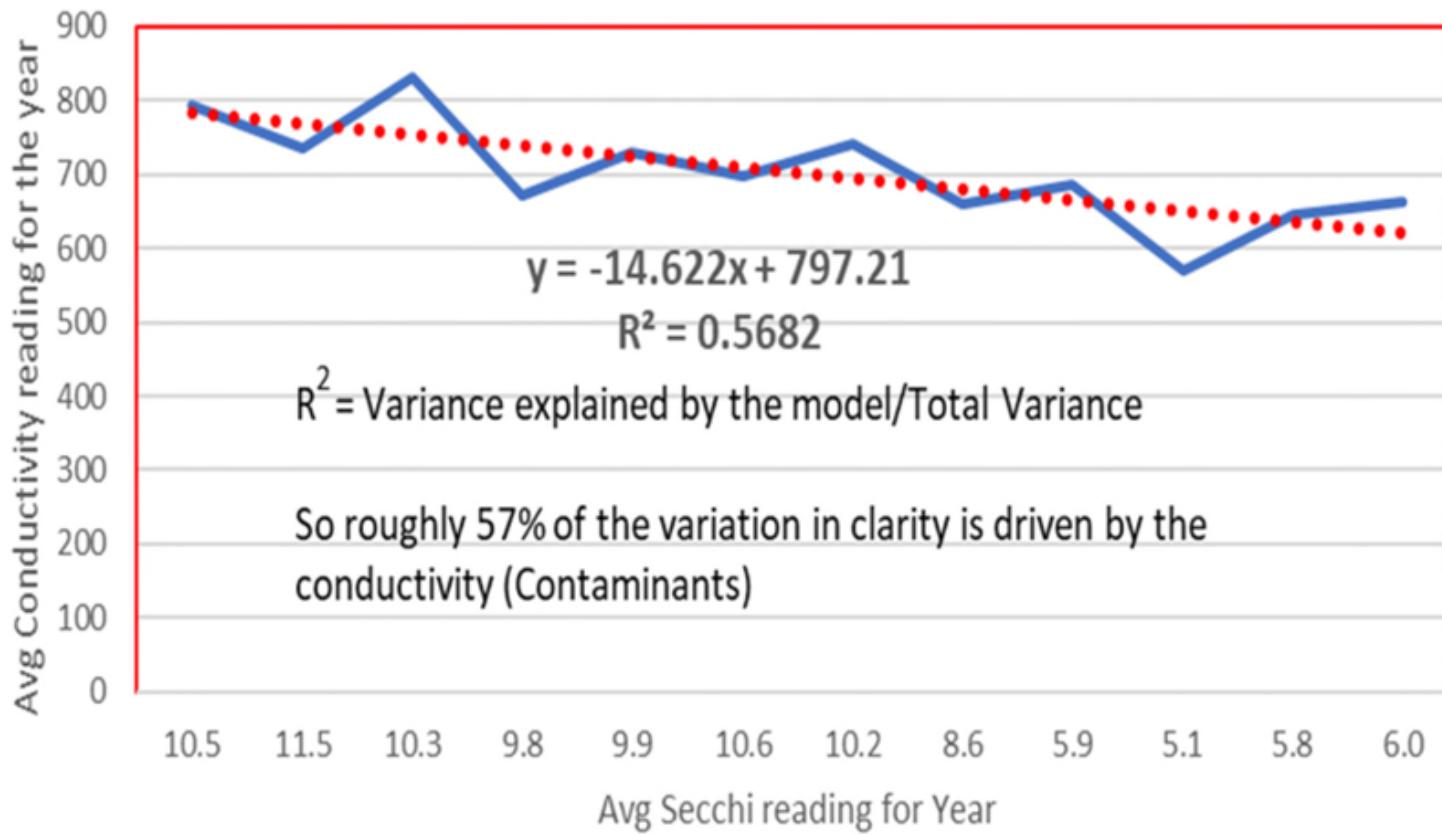
**Concept suggestion only** (Need neutral 3<sup>rd</sup> party environmental Engineering guidance):

Baseline layout, modified to **fit at 960 ft elevation**. Reduce road length further?? **1 acre lots, .15 max lot coverage**

Get to **0.15-0.25 C factor**, then **oversize flooding and nutrient absorption safety factors**. **960 ft elevation enabler?**

**Eliminate sidewalks, reduce roadway and increase lot sizes until 0.15-0.25 C value achieved (W/ neutral Enviro Engrg)**

## Avg Conductivity Versus Secchi reading Station 6



**Conductivity is heavily impacting our water clarity** (57% factor)

Limnologists point to Nitrogen (including ammonia build), calcium and Phosphorous from:  
- excessive runoff (=>nutrients) and boat churn driving clarity issues.

		Current				R2 original baseline			
		Acres	Imp Rating	Net C Factor	Flow to be protected	Imp Rating	Net C Factor	Flow to be protected	
<b>East Detention</b>	<b>2.55</b>			0.1	24,235 gals/hr		0.48	116,993 gals/hr	
Impervious Acres	1.03		0.1			0.9			
Pervious acres	1.52		0.1		45,700 gals/day	0.2		220,615 gals/day	
<b>West Retention Basin</b>	<b>7.83</b>			0.1	74,416 gals/hr		0.36	264,589 gals/hr	
Impervious Acres	1.74		0.1			0.9			
Pervious acres	6.09		0.1		140,326 gals/day	0.2		498,938 gals/day	
<b>Wetland Pretreatment</b>	<b>1.83</b>			0.1	17,392 gals/hr		0.50	86,676 gals/hr	
Impervious Acres	0.78		0.1			0.9			
Pervious acres	1.05		0.1		32,797 gals/day	0.2		163,445 gals/day	
<b>South Retention</b>	<b>12.83</b>			0.1	121,935 gals/hr		0.39	464,075 gals/hr	
Impervious Acres	3.31		0.1			0.9			
Pervious acres	9.52		0.1		226,350 gals/day	0.2		875,114 gals/day	
<b>Gallons/Hr</b>					<b>Gallons/Hr</b>				
<b>Total Gallons to treat per hour</b>		<b>237,978</b>				<b>932,333</b>			
<b>Total Gallons/24 hours</b>		<b>Gallons/day</b>				<b>Gallons/day</b>			
		<b>445,174</b>				<b>1,758,113</b>			
<b>Runoff Coefficient</b>		<b>C</b>	<b>0.1</b>			<b>C</b>	<b>0.41</b>		

Runoff coefficient is significantly too high versus typical R2, 1 acre developments  
 Too much concrete, trying to fit too many residences in

Land Use	% Impervious Cover
Commercial and business district	85%
Industrial	72%
Residential district with 1/8 acre or less lot size (town houses)	65%
1/4 acre lot size	38%
1/3 acre lot size	30%
1/2 acre lot size	25%
1 acre lot size	20%
2 acre lot size	12%

Sources: University of Delaware, Water Resources Agency, 1998; USDA, Soil Conservation Service, TR-55, 1983.

3. Infiltration tests are required during final design to confirm the permeability of the existing soils.
4. Direct maintenance access to the forebays for heavy equipment shall be considered.
5. The proposed storm sewer and its corresponding inverts connecting Forebay B to the Retention Basin is recommended to be shown in the Retention Basin Cross Section on Sheet 10 for clarification of how this system will function. The depiction of Forebay B's spillway into the Retention Basin should also be revised as this forebay is proposed to overflow into the existing pond.
6. With this project being within the Township's natural features protection area, we note that the majority of the existing natural drainage area from this site to the  $2.1 \pm$  acre pond in the southwest corner is proposed to be intercepted for storm water pre-treatment and retention to minimize discharges to Woodland Lake, helping to maintain water quality. As a result of the decrease in the contributing surface runoff area, the water surface area and elevation of this pond may be impacted.



November 3, 2025

Via email: [planner@brightontwp.com](mailto:planner@brightontwp.com)

The PUD layout would drive 1.66 Million Gallons per day for a 100 year rain event  
The R2 design would drive 1.76 Million gallons per day for 100 year rain event.

Wet retention bays would need overdesigning to ensure no overflow would ever impact residents along Woodland Shore. Infiltration issues exist for the currently designed bays, as they have a base surface at lake level, which allows less infiltration and more potential cross talk to the pond. This area needs to be elevated and oversized so that infiltration plus evaporation would never allow overflowing to the pond. **As is, this design will overflow into the pond.**

Recreational Carrying Capacity is a **standardized approach** to assess safe boat density  
 Exceeding 100% **drives boater safety and total contamination** issues into a lake  
 WL is at 420% recommended density. **We're overutilized, driving contamination, churn and safety issues**

Lake	Pine	Upper Crooked	Gull	Sherman	Woodland	Woodland + PUD
Boats with Greater than 25 HP	389	165	961	50	192	
Boats with motors Less or equal to 25 HP	200	53	48	25	52	
Personal Watercraft	98	30	198	6	44	
Sailboats	12	11	223	11	12	
Non-Motorized Boats	397	178	232	92	202	
Total	1096	437	1662	184	502	
Boats per household	<b>1.90</b>	<b>1.57</b>	<b>2.28</b>	<b>1.92</b>	<b>1.65</b>	<b>1.65 x 11 = 18 more boats</b>
Total Lake Area	660	645	2047	153	305	
Area less than 5 feet deep	284	361	203	28	74	
Shallowness ratio	0.43	0.56	0.10	0.18	0.24	average 7.5 feet
100 foot shoreline safety protection zone (acres)	147	167	162	35	77	
Useable lake area (Acres)	513	478	1885	118	<b>228</b>	
10% of moored Boats (Estimate during peak/study)	110	44	166	18	50	<b>52</b>
Public access boats (assumes full at peak)	5	9	70	15	<b>28</b>	<b>28</b>
Estimated Number of Boats on lake during Peak Periods	115	53	236	33	78	<b>80</b>
Useable Lake Area (Acres)	513	478	1885	118	228	<b>228</b>
Carrying Capacity ( <b>12.25 acres/Boat</b> )	42	39	154	10	19	<b>17</b>
Percentage of Carrying Capacity at peak use	<b>274%</b>	<b>135%</b>	<b>153%</b>	<b>347%</b>	<b>420%</b>	<b>471%</b>
					With current housing	assumes only 11 net added homes/37 condos

# Rational Method Runoff Coefficient Tables for Storm Water Runoff Calculation

Categories : Hydraulics in civil engineering Tags : Civil engineering

	Runoff Coefficient, C					
	Soil Group A			Soil Group B		
Slope :	< 2%	2-6%	> 6%	< 2%	2-6%	> 6%
Forest	0.08	0.11	0.14	0.10	0.14	0.18
Meadow	0.14	0.22	0.30	0.20	0.28	0.37
Pasture	0.15	0.25	0.37	0.23	0.34	0.45
Farmland	0.14	0.18	0.22	0.16	0.21	0.28
Res. 1 acre	0.22	0.26	0.29	0.24	0.28	0.34
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Res. 1/4 acre	0.30	0.34	0.37	0.33	0.37	0.42
Res. 1/8 acre	0.33	0.37	0.40	0.35	0.39	0.44
Industrial	0.85	0.85	0.86	0.85	0.86	0.86
Commercial	0.88	0.88	0.89	0.89	0.89	0.89
Streets: ROW	0.76	0.77	0.79	0.80	0.82	0.84
Parking	0.95	0.96	0.97	0.95	0.96	0.97
Disturbed Area	0.65	0.67	0.69	0.66	0.68	0.70

This type of chart exists in numerous storm water discussions.

Typically, runoff from R2 (1 acre) is expected to be in the range of 0.2 to 0.34, depending on soil parameters, roadway designs, etc...

EGLE, USGS, Penn State, Michigan Lake and Stream, etc.. All recommend less than 0.15 for runoff coefficients near streams and inland lakes.

Forcing additional homes, roadways and sidewalks into this area has yielded C factors of Over 0.4, hugely disruptive and should not be allowed.

## What can you do to minimize the effects of impervious surfaces?

For more information on particular topics, see numbered resources below:

### Minimize hard surfaces like rooftops and driveways on your property

- Share driveways with neighbors where possible
- Use narrow driveways
- Minimize building footprints - build "up" instead of "out"
- Remove unneeded hard surfaces, such as extra parking spots

### Use pervious materials where possible

- Green roofs
- Mulch walkways
- Permeable pavers for walkways or driveways

1

### Capture or infiltrate runoff

- In rain barrels
- In gutters & downspouts
- In rain gardens

1

2

### Control erosion during construction and after development

5

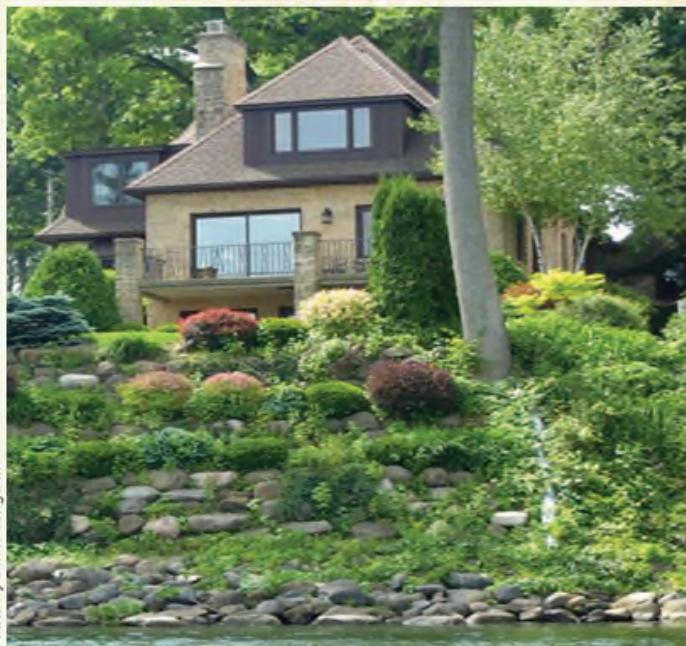
### Minimize fertilizer use

- Have soil tested first to see if fertilizers are needed, and use as little as possible.

### Maintain or restore shoreline plants to slow runoff and provide habitat

3 4

- Maintain or restore at least a 35-foot wide shoreline buffer
- Let nature reestablish the shoreline!



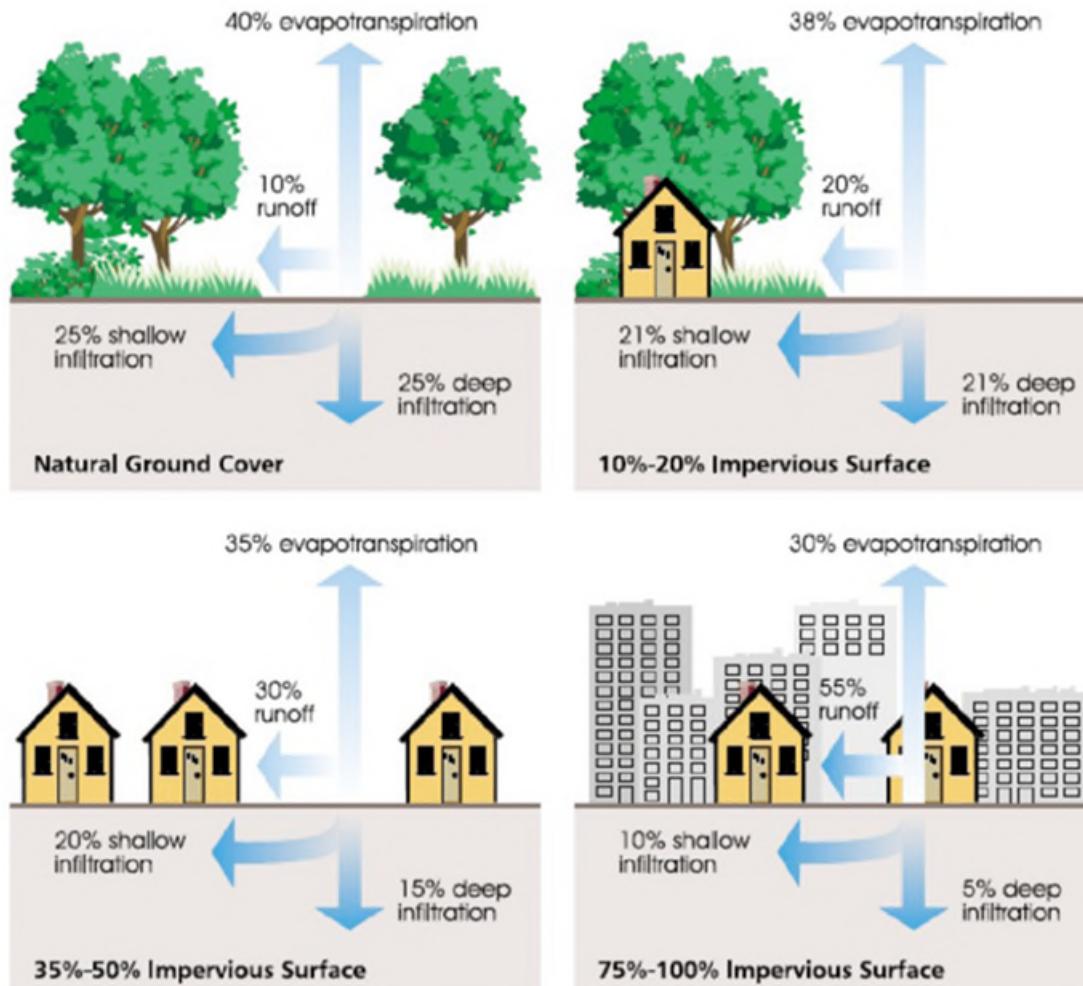
### Planning group:

- Minimize impervious surfaces
- Use permeable materials as possible
- Capture or filter all runoff, drains
- Control Erosion/Runoff in construction
- Minimize fertilizer use after build
- Maintain shoreline plants
- 35 foot lakefront vegetation buffers after construction
- Larger lots, lower build footprint %, fewer roads, less roofing, less parking, fewer automobiles, fewer additional people/contaminants

Land Use	% Impervious Cover
Commercial and business district	85%
Industrial	72%
Residential district with 1/8 acre or less lot size (town houses)	65%
1/4 acre lot size	38%
1/3 acre lot size	30%
1/2 acre lot size	25%
1 acre lot size	20%
2 acre lot size	12%

Sources: University of Delaware, Water Resources Agency, 1998; USDA, Soil Conservation Service, TR-55, 1983.

PUD as proposed, versus R2 current zoning, creates 50% impervious surfaces over 40 acres, instead of the 15% impervious required by R2 designation



Runoff must be contained in Basins designed for 100 year rain event capacity

The 40 acres being discussed, has as much as 80 feet elevation above our lake.

Each inch of rain adds 27,154 gallons of water to an acre.

Runoff from this 40 acres will be increased. Instead of 15% runoff with 15% impervious surface, new runoff will be at 45% for 50% impervious surface

The Engineered basins would have to accommodate  
 $27,154 \times 45\% \times 3.5 \text{ inches/hour} = 42,768 \text{ gallons/hr}$  versus  
 $27,154 \times 15\% \times 3.5 \text{ inches/hour} = 14,256 \text{ gallons/hr}$

3 times the runoff

From Michigan EGLE document labeled “protecting Michigan Inland Lakes”

# Protecting Michigan's Inland Lakes:

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## A Guide for Local Governments



## From Michigan EGLE document labeled “protecting Michigan Inland Lakes”

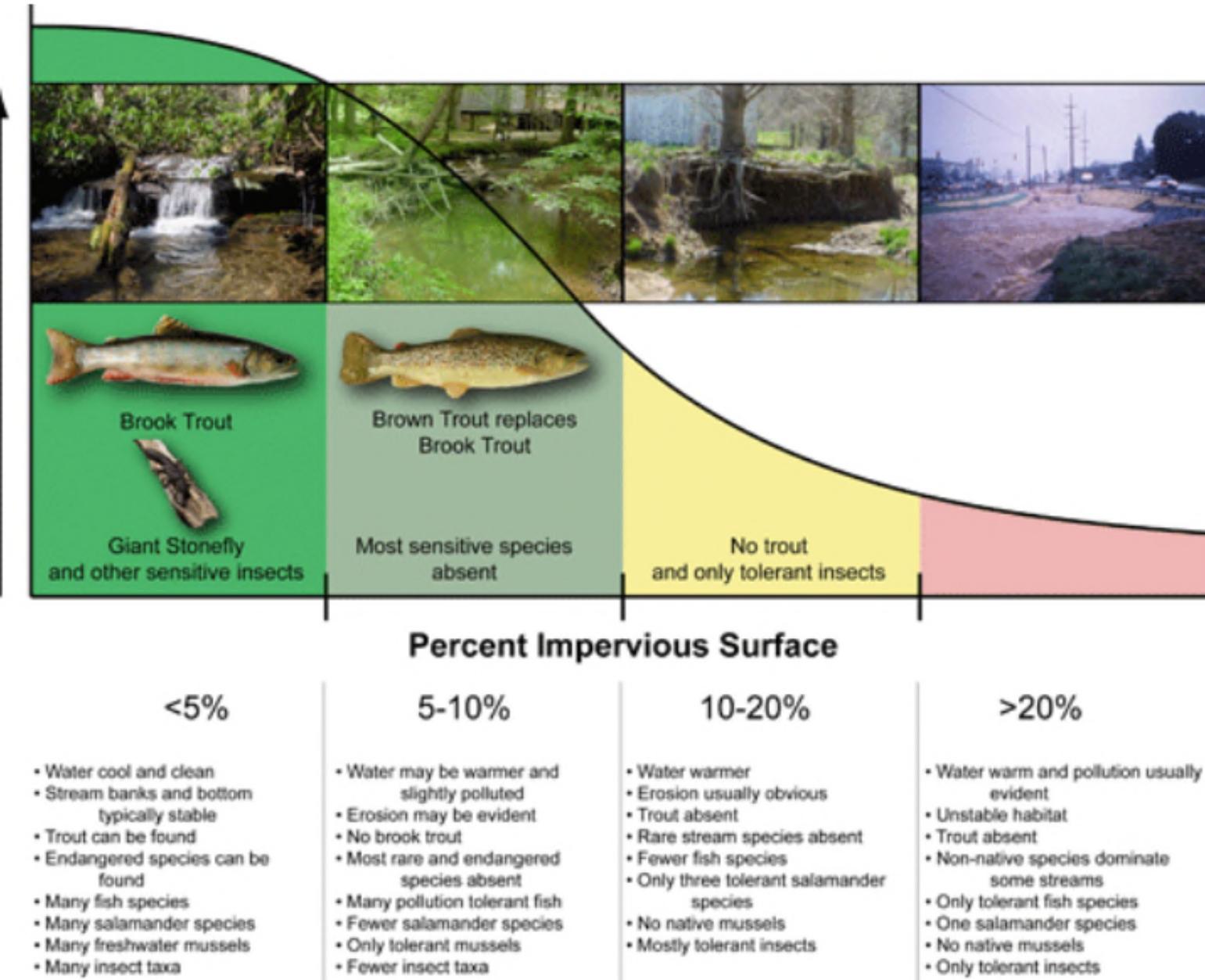
### Example Goals and Strategies for Inland Lakes

- Maintain and improve fish and wildlife habitat and water quality.
  - Protect water bodies (lakes, rivers, wetlands) by establishing a building setback and required greenbelt.
  - Implement low impact development techniques and limit impervious surfaces to reduce polluted runoff.
  - Enact and enforce soil erosion and sediment control regulations.
  - Regulate shoreline construction of seawalls and docks.
  - Ensure all federal, state and county permits are coordinated with the local development process.
  - Implement a septic maintenance ordinance.
- Maintain natural and/or rural character.
  - Establish a building setback and required greenbelt around lakes and rivers.
  - Ensure existing natural features are identified on site plans and standards are developed to protect these features.
  - Support efforts of the local and county park department, land conservancies and others to protect sensitive lands through acquisition and conservation easements.
- Maintain and improve recreational opportunities that also support a healthy ecosystem.
  - Control lake access through anti-keyhole ordinance.
  - Regulate shoreline construction of docks and seawalls.
- Maintain the trophic state of the lake by reducing phosphorus inputs.
  - Require all new development to leave a shoreline buffer to filter runoff.
  - Require all new development to use stormwater treatment practices designed to remove phosphorus from stormwater runoff.
  - Adopt stormwater performance criteria that call for no increase in phosphorus loading from new development.
- Control terrestrial and aquatic invasive species
  - Enact weed/landscaping ordinances that prohibit planting of invasive species and allow/encourage or require native species.
  - Provide education and awareness to residents and visitors on how to limit the spread of aquatic invasive species.

## **Stormwater Management Best Practices**

- Prohibit the discharge of stormwater to wetlands and the use of natural wetlands to treat stormwater – instead encourage low impact development, creation of rain gardens, green roofs, wet detention basins and other engineered solutions.
- Control quantity, timing, and quality of runoff.
- Set a limit for impervious areas, require pervious (porous) surfaces whenever possible, and reduce parking requirements.
- Reduce design demands for curbs and gutters, allow replacement with grassed swales where appropriate.
- Protect and restore green infrastructure, such as wetlands and other natural landscapes and drainage ways.
- Ensure proper installation and require routine maintenance of stormwater control measures.
- Treat “first flush” runoff - the runoff that occurs at the beginning of a rainstorm and generally contains a higher concentration of pollutants.
- Protect natural vegetation along shorelines and streambanks with natural features setbacks.
- Prevent filling in wetlands, floodplains, and other natural stormwater collection areas.
- Require a stormwater management plan at the site plan review stage for new, modified or expanded developments.

## Stream/Lake Health



These 2 charts demonstrate prior DNR/USDA studies that indicate the negatives of overbuilding around waterways and lakes.

Every additional square foot of impervious surface (Roads, parking areas, shingle roofs, etc) adds significantly to degradation of our lake.

Every additional person/family also contribute to contamination, cars, fuels, oils, home maintenance waste, etc.

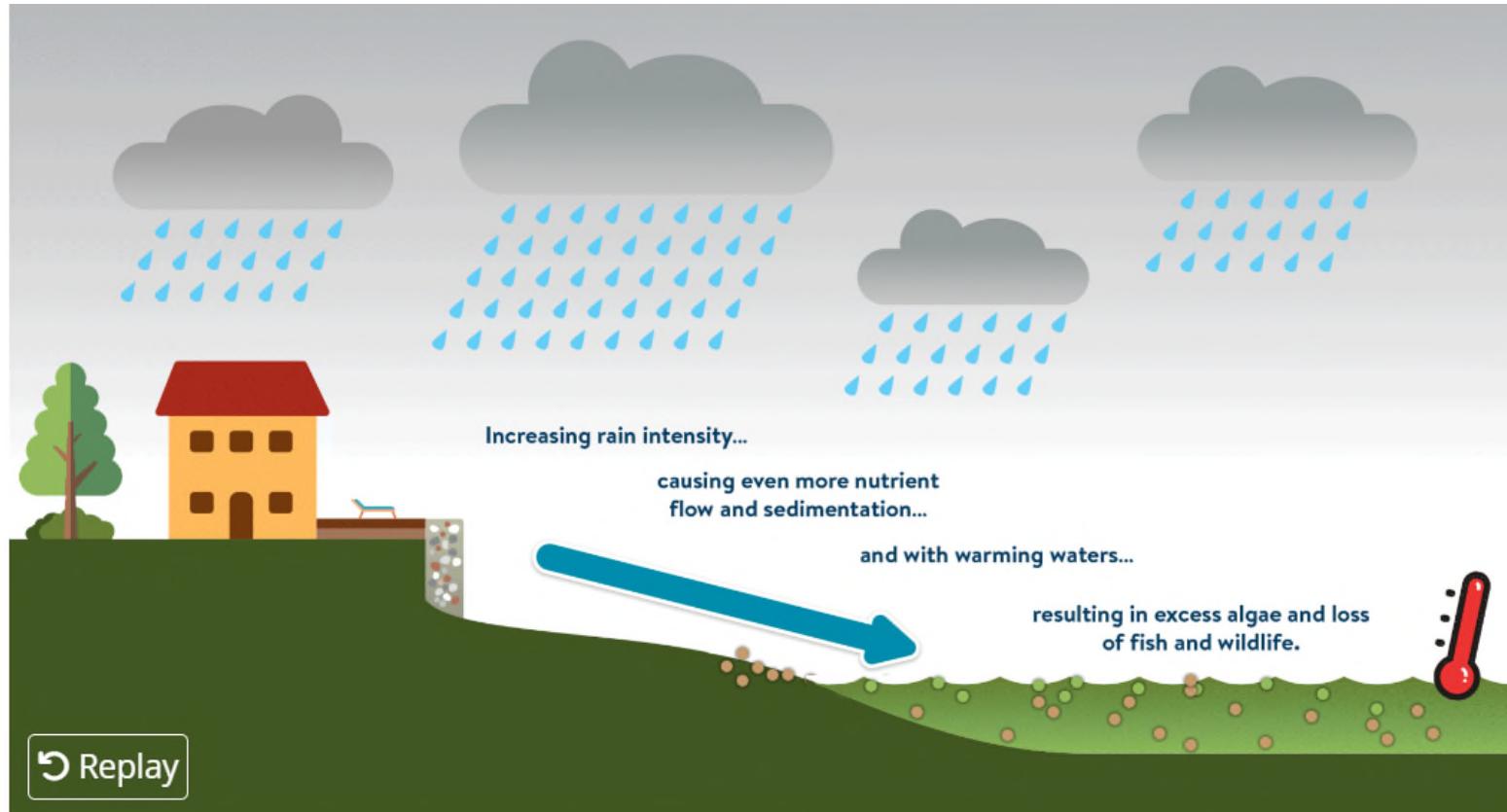
## How vegetation loss makes lakes and rivers more vulnerable to algae growth

### Natural shoreline retained



In this scenario, the lake home is set back from the water and most of the existing natural vegetation between the home and the lake and along the shoreline is left intact (Figure 1). This vegetation holds soil in place and slows down nutrient-laden runoff, increasing infiltration and decreasing the amount of nutrients flowing into the lake. In this more natural condition, nutrient flow is in equilibrium with the needs of aquatic life resulting in clean water and habitat that supports healthy fish and wildlife.

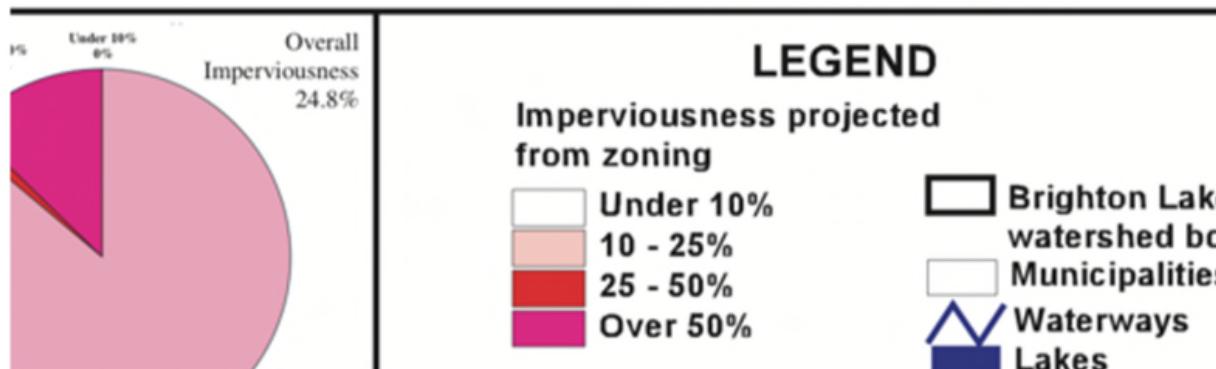
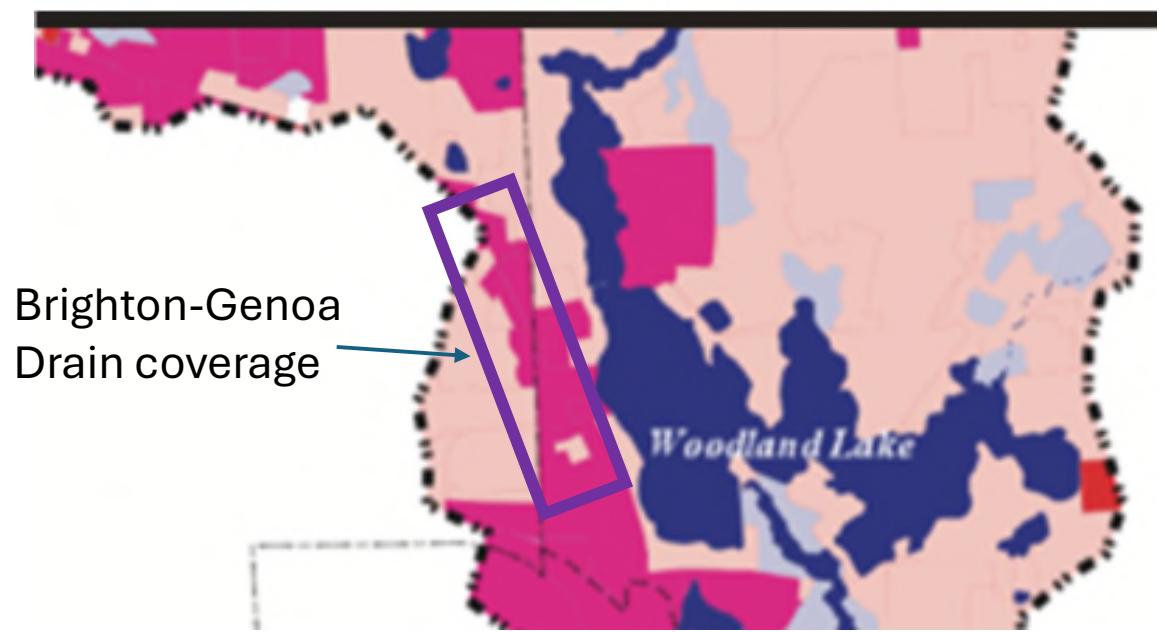
This study, from Minnesota Department of Natural resources, is one of many that demonstrates how we have overbuilt our inland lakes and are damaging their health for humans and aquatic life



Continued contemporary shoreland development along with more intense rain events and warming waters are accelerating the growth of algae and aquatic plants and loss of clean water. Unless the flow of nutrients to our lakes and rivers are reduced, we face:

- Growing health and safety concerns for our families and pets due to more frequent and long-lasting algal blooms, some toxic.
- Reduced swimming and other in-water activities due to increases in aquatic plants and algae.
- Loss of fish and wildlife species we associate with natural areas, including loons.
- Loss of recreational tourism businesses due to loss of fisheries and/or declining water quality.
- Decline in shoreline property values and tax base due to declining water quality.





This impervious surface map **was created in 2002**. It shows very high levels around Woodland Lake at that time, particularly the **West, South and Northeast as over 50% impervious**.

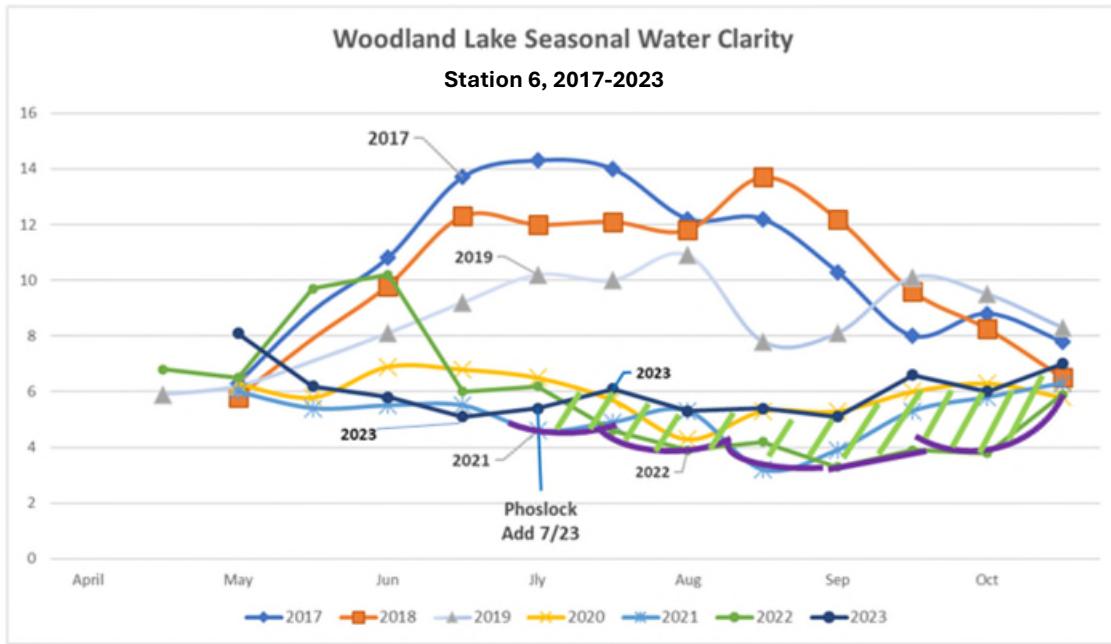
**Grand river Drain surfaces are over 50% impervious**, along with having up to 90 feet of elevation above lake.

1 acre of impervious surface can flow 27,000 gallons of water for every inch of rain.

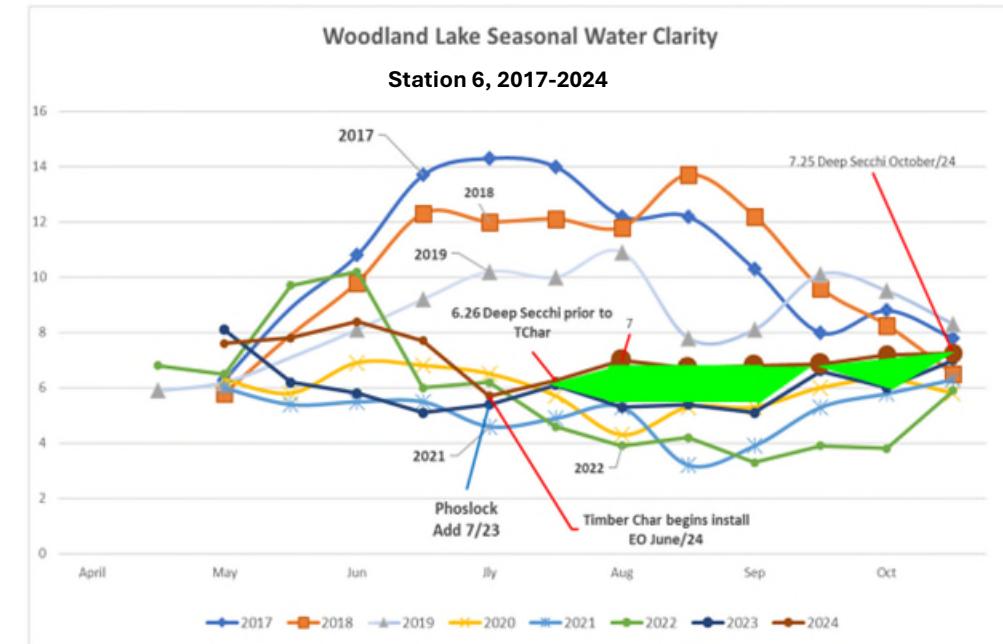
All contamination and nutrients from homes and businesses in this 70 acre coverage zone rush into our lake through the Brighton-Genoa drain system.

The new development area has a little over 40 acres of land. **The PUD as proposed** will yield **almost 50% total impervious surface coverage** (with roads/sidewalks). Extensive runoff

There have been 2 Road Commission projects, **Project 903 in 2012**, adding drain basins near Meier Flowerland and **Project 863 in 2014**, widening Grand River and increasing flow capacity to address increased flow to this drain from overbuild. Still not adequate



Station 6 clarity improvement from **Phoslock, 2023**



Station 6 clarity improvement from **Timber Char, 2024**

The additions of Phoslock and Timber Char has helped minimally, more work needs to be done with Timber Char to get an accurate picture. (\$350K over past 2 year to combat contamination)  
Struggles continue regarding water clarity. **Too many inputs of contaminants, nutrients from homes, roads, businesses and drains, plus boat churn** are giving us great difficulties. (Geese add to bacterial loading in recent years due to disease concerns and our inability to relocate them)



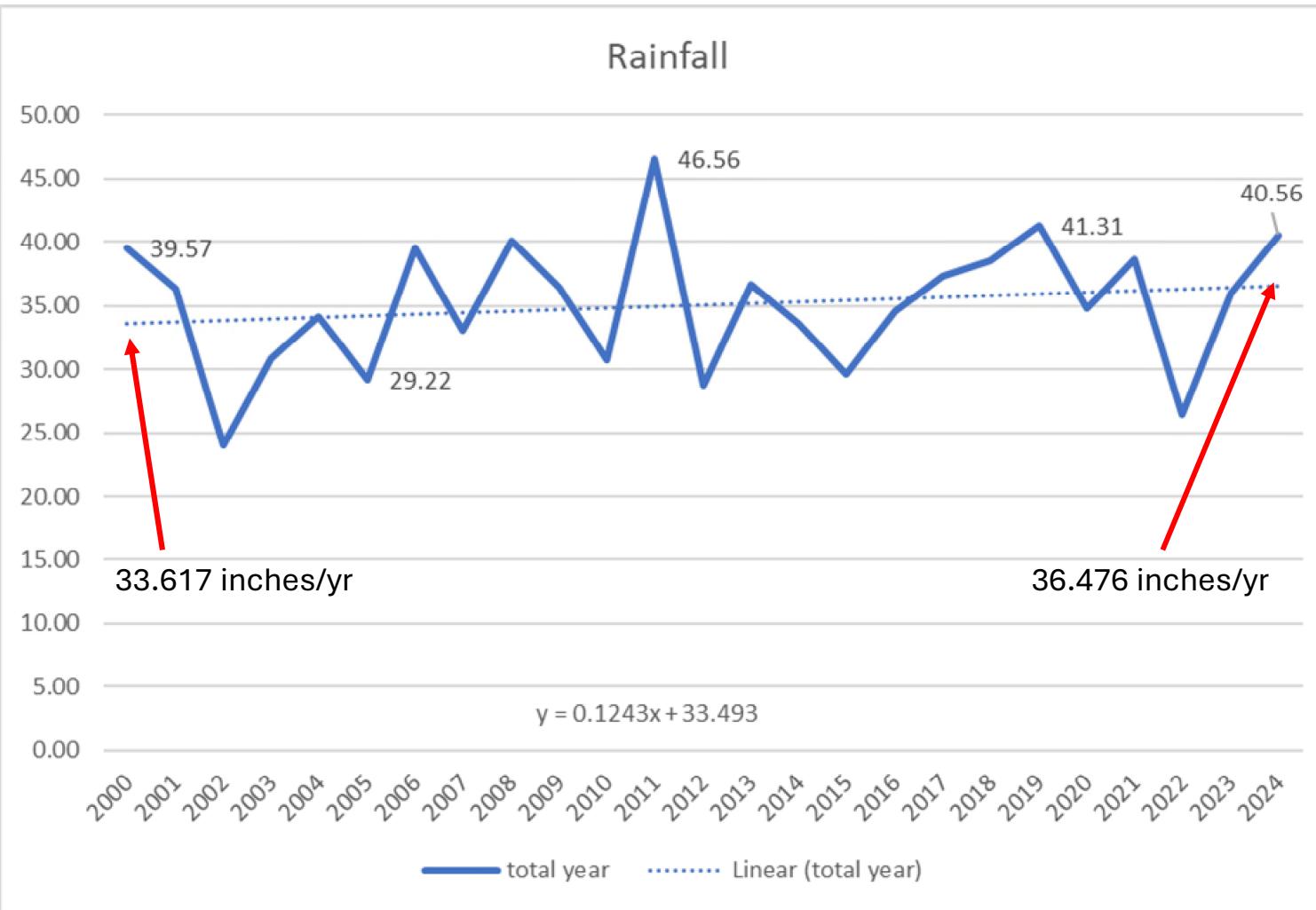
**See the impact wake boats are having on Wisconsin's inland lakes**

Numerous studies (Including EGLE) recommend that they only be used more than **500 feet from shore** and in a **minimum of 15 feet of water** to prevent bottom churn (high ammonia levels, algae buildups, erosion)

**Aquatic life** is impacted due to resulting low dissolved Oxygen levels

EGLE working to eliminate Wake Boat use in inland lakes that do not meet these requirements

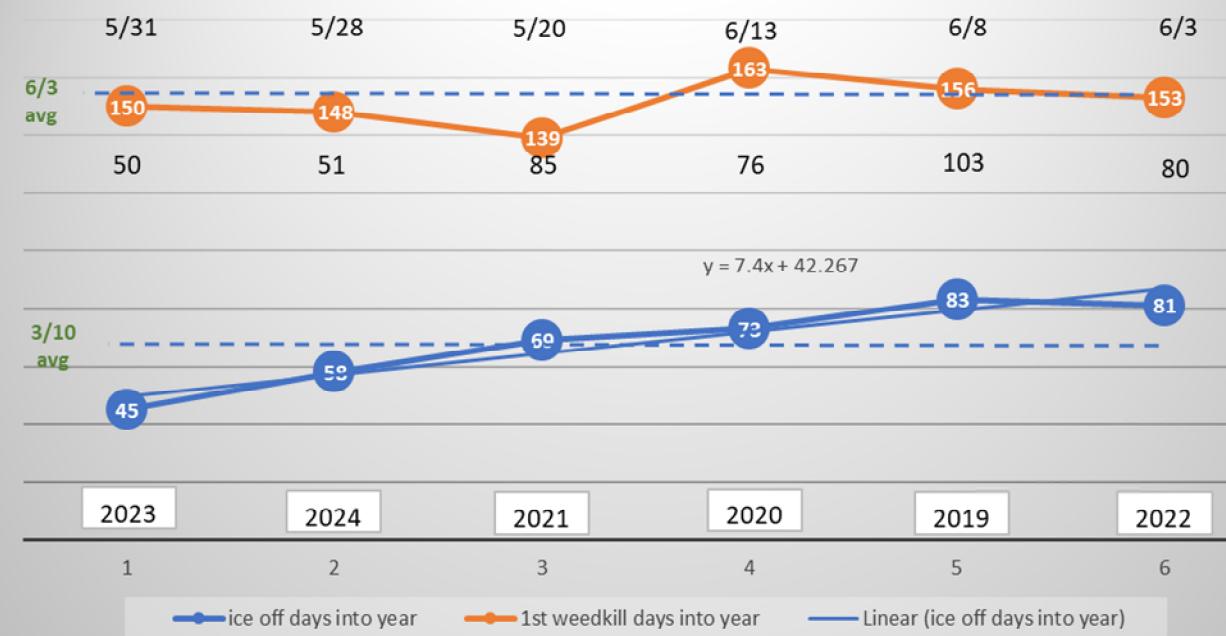
Woodland lake has only a 7.5 foot average depth, is being negatively impacted by wake boats



	Rain change/month
aug	2.1
oct	1.1
mar	1
jul	0.8
apr	0.7
jan	0.6
feb	0
jun	0
dec	-0.3
sep	-0.4
nov	-1
may	-1.6
Inc 2020-2025	2.86 inches

Rainfall trend per year has increased by 2.86 inches total per year on average on Woodland lake  
**Heavier rains => more nutrients** from road drains and creek beds, based on Limnologist's history  
 Months of **August, October and March** have significantly more rain now than in the year 2000.  
 GR, Hacker and other drains need to be assessed for flow capacity  
**Rain typically carries from 7 to 20 pounds of nitrogen per acre to earth per year from the atmosphere**

## Ice off date versus days into the year for 1st weed kill



These charts were trying to **determine relationships** between early ice off date, total ice coverage days for the year and when we first decided we needed to kill weeds.

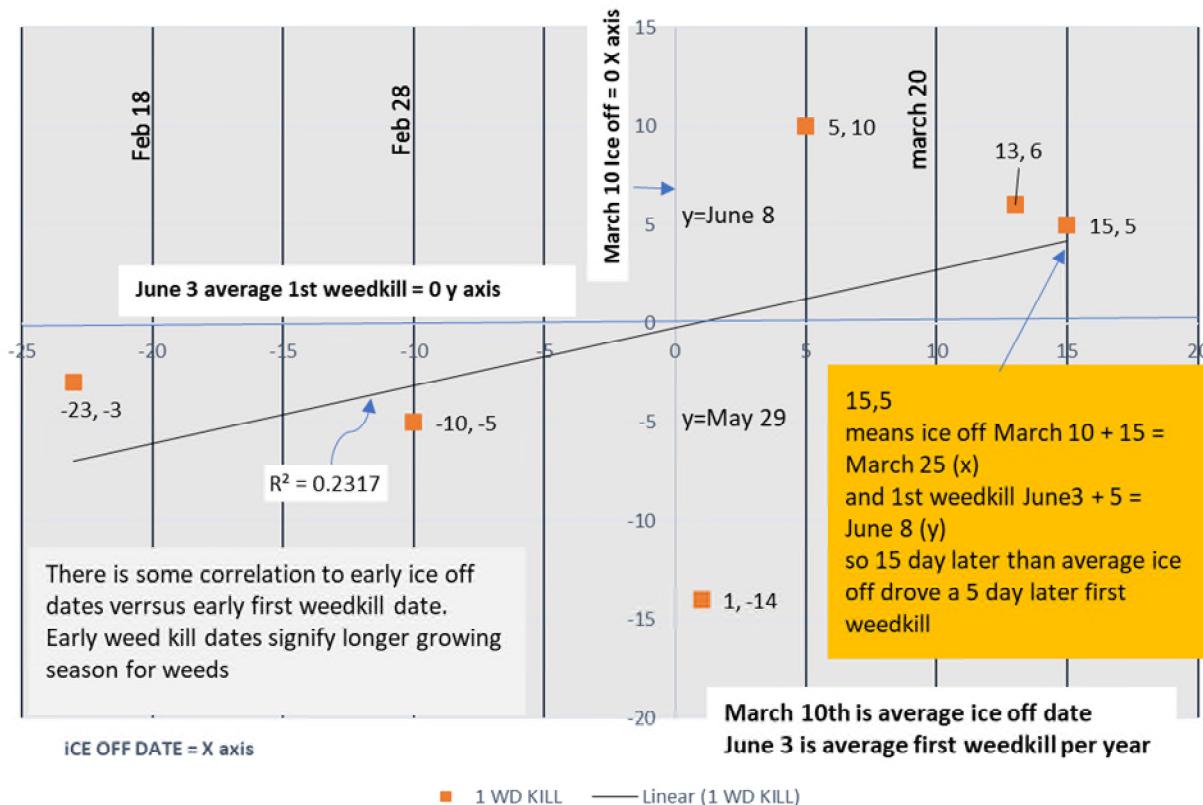
- ⇒ Early ice off shows an earlier need for first weed kill, but about 23% factor, but appears relevant
- ⇒ No indications of less or more weeds due to shorter ice over days for each year. Needs discussion

Date of first weed kill, avg 6/3

Total days of ice coverage

Days into year for ice off, avg 3/10

## ICE OFF DATE VERSUS FIRST WEEDKILL DATE FOR MAIN LAKE



The main drivers for inland lake water quality degradation in Michigan include:

- **Nutrient runoff** from agriculture and fertilization practices, leading to eutrophication and increased algal growth. [⊕ 1](#)
- **Wetland removal** and artificial drainage systems that reduce natural filtering of nutrients and sediment. [⊕ 1](#)
- **Pesticide and chemical use**, which contribute to increased pollutant runoff into lakes. [⊕ 1](#)
- **Shoreline development** and direct removal of aquatic macrophytes, which reduce habitat for aquatic organisms. [⊕ 1](#)
- **Non-point source pollution** from various sources, including urban runoff and septic systems, which can lead to nutrient and chemical accumulation in lakes. [⊕ 1](#)

These factors collectively contribute to the degradation of water quality in Michigan's inland lakes.

EGLE and EPA report reveals the degraded conditions of Michigan's inland lakeshores.

EGLE, EPA, MSU, USGS, Michigan Lakes and Streams all agree that overdevelopment of inland lakes are our biggest threat to water quality/clarity.

Impervious surfaces, such as roads, roofing, sidewalks, patios create rapid runoff of nutrients and contaminants, instead of being absorbed into the ground and filtered into the plants

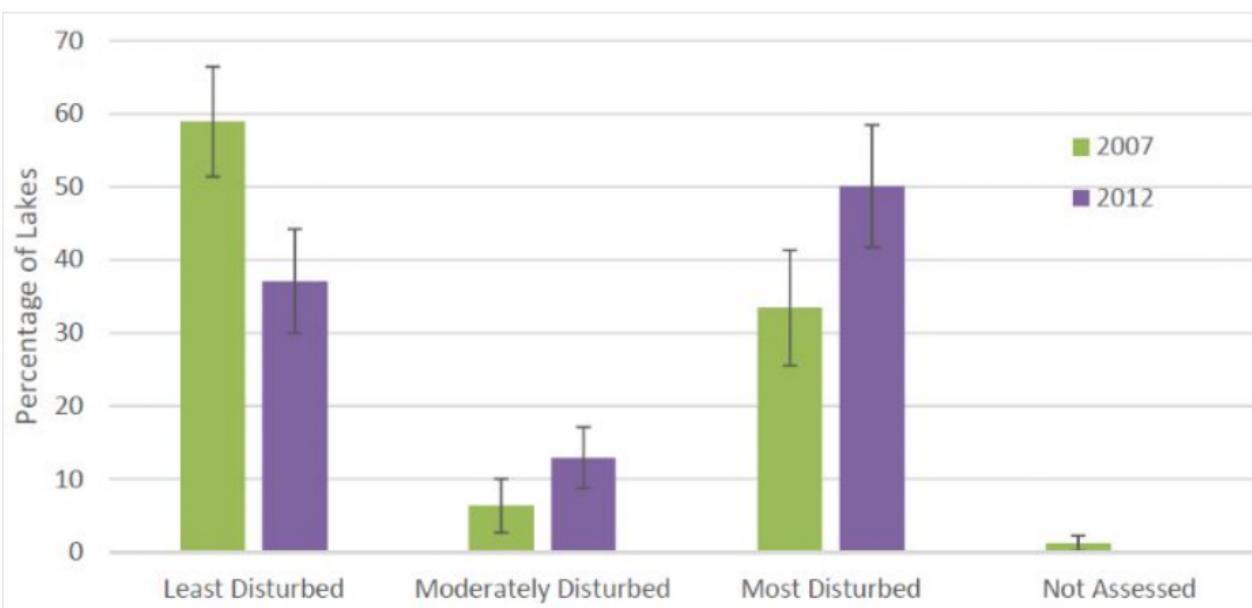


Chart shows significant move towards most disturbed inland lakeshores due to overdevelopment from 2012 to 2017 in Michigan



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The proposal is for thirty-two (32) lots of a minimum size of 16,000 sq. ft. The proposed setbacks are twenty-five (25) ft. front yard, thirty (30) ft. rear yard, and ten (10) ft. side yards. Setbacks from all wetlands must be a minimum of twenty-five (25) ft. The other part of the development is eight (8) detached condominiums.

The lot sizes required in the R-2 zoning district are approximately 40,000 sq. ft. (.91 acre). The lot widths required in the R-2 district are 160 ft. The lot coverage in the R-2 district is fifteen (15%) percent. The setbacks required in the R-2 zoning district are thirty-five (35) ft. front yard, twelve (12) ft. side yard, thirty-five (35) ft. rear yard, and twenty-five (25) ft. minimum with the average of 300 ft. along the lake required for the natural feature setback (Woodland Lake). The parallel plan for the R-2 zoning district meets all Zoning Ordinance requirements.

Not true

4. **Compatibility with the Planned Development Intent.** The proposed plan allows for innovation in land use planning, coordinated development, protects significant natural features, and includes a sidewalk along one side of the roadways as required by the zoning ordinance. Other amenities could be considered to provide additional benefits for the project.
5. **Development Impact.** The site is surrounded by single-family homes.
6. **Unified Control of Property.** The site must be developed as one project/owner.

## **EXISTING LAND USE, ZONING, AND FUTURE LAND USE**

The following table gives an overview of the existing uses and zoning, in addition to the future land use indicated in the Master Plan, for the subject site and surrounding parcels.

The applicant has depicted a parallel plan for the R-2 zoning district depicting thirty-one (31) lots; it depicts natural buffer areas of less than the one hundred (100) ft. requirement per *Article 10*; however, the Planning Commission can approve a smaller natural buffer area. The lot sizes required in the R-2 zoning district are approximately 40,000 sq. ft. (.91 acre) lots. The lot widths required in the R-2 district are 160 ft. The lot coverage in the R-2 district is fifteen (15%) percent. The setbacks required in the R-2 zoning district are thirty-five (35) ft. front yard, twelve (12) ft. side yard, thirty-five (35) ft. rear yard, and twenty-five (25) ft. minimum with the average of 300 ft. along the lake required for the natural feature setback (Woodland Lake). The proposal is for thirty-two (32) lots of a minimum size of 16,000 sq. ft. and eight (8) detached condominiums. The developer has depicted the open space calculations regarding the open space. As depicted on the conceptual plan, most of the site will remain undisturbed and will be protected through a conservation easement.

Most of the property is designated as natural features on the Natural Features Protection Area map. As part of the site plan review, the applicant has to comply with the requirements outlined in *Article 10* of the Zoning Ordinance which includes an environmental impact assessment which has been conducted. Additionally, many wetlands are located on the property which is assumed to be under EGLE's jurisdiction. The applicant has provided a general environmental assessment.

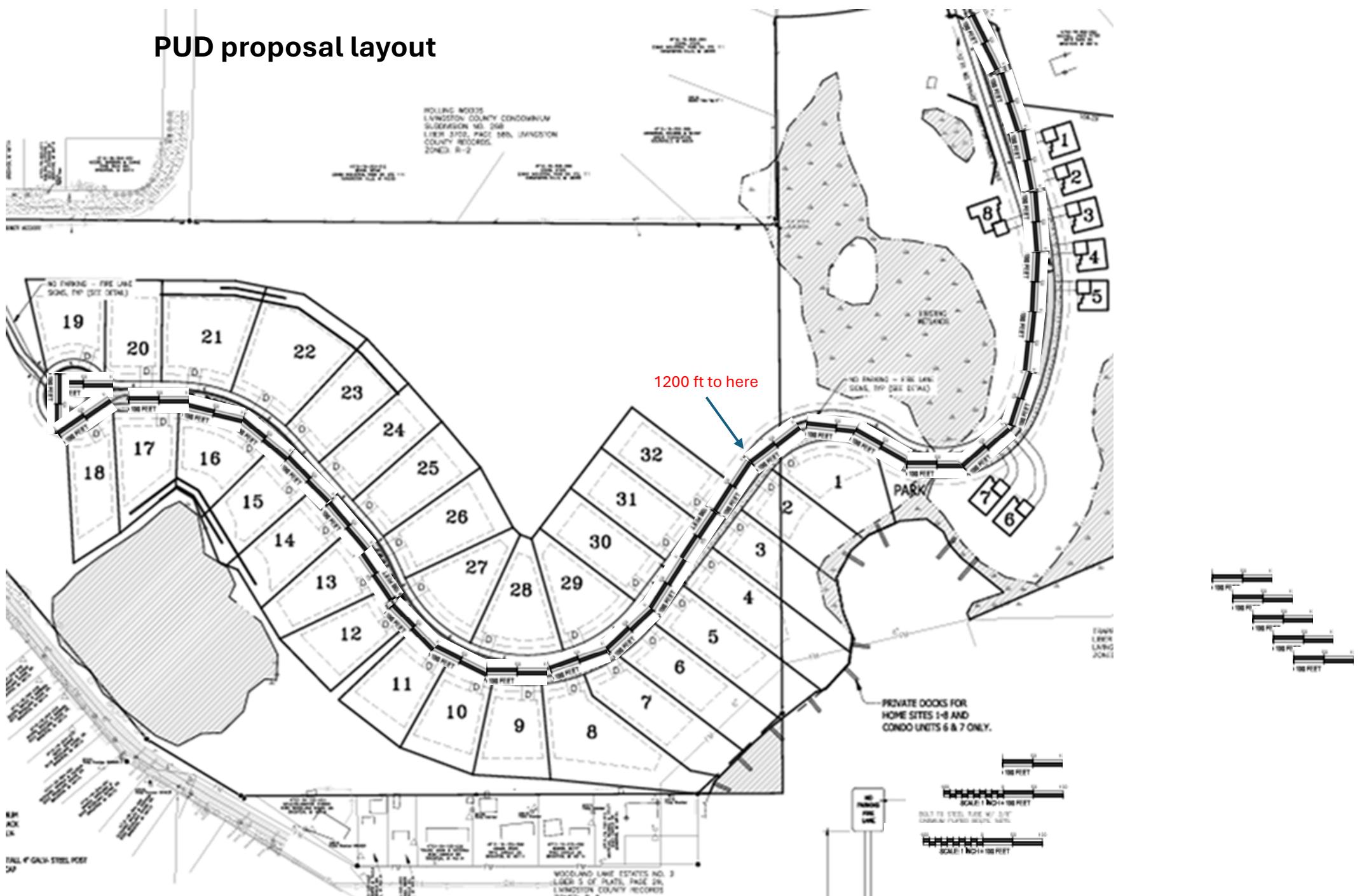
A ten percent (10%) density bonus may be allowed for developing under a PUD; an additional ten percent (10%) may be allowed for connecting into the sewer system; and another ten percent (10%) may be allowed for connecting into the water system. Assuming a thirty percent (30%) increase over the thirty-one (31) units allowable under the R-2 zoning would be forty (40) units.

**9.375 times 1.3 = 12.2 lots**

**Master plan**

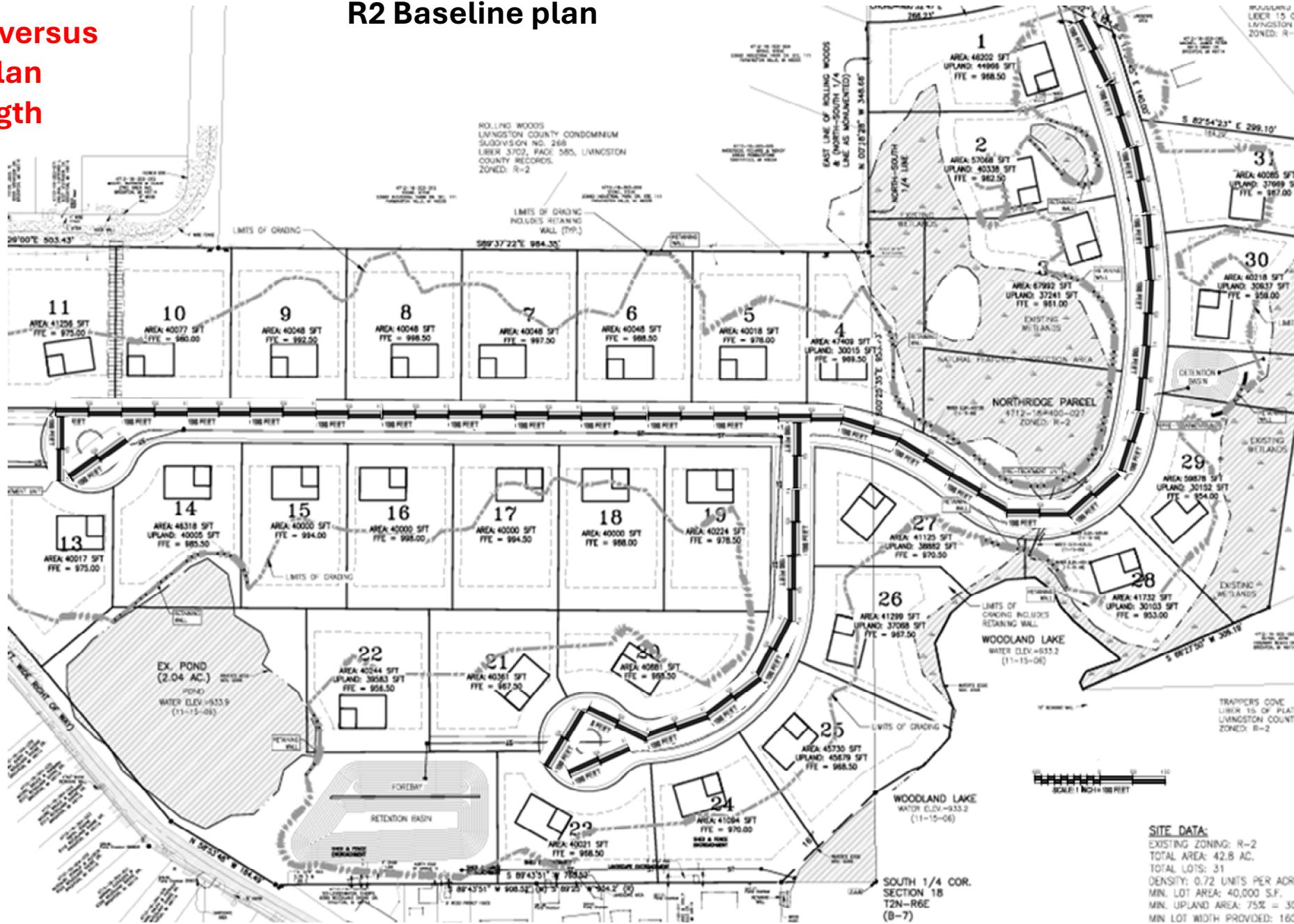
## PUD proposal layout

2,888 ft to  
culdesac  
Versus 750  
feet per  
Master Plan



**3,400 ft total versus  
750 Master Plan  
Roadway length**

## R2 Baseline plan



To Woodland Lake Shore Homeowners Association , Inc.

I am representing Dr. Luke Sheng in the sale of his 27.6 acre parcel on Woodland Shore Drive. The purpose of this letter is to begin a discussion with Woodland Lake Shore Homeowners Association, Inc. ("The Association") and Dr Sheng on how he may proceed to have his parcel of land participate with the Association in the costs of repair and maintenance of the private roads serving his property.

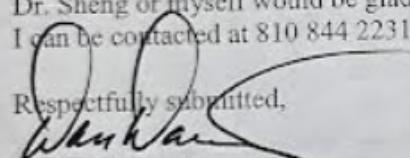
Our preliminary discussions with Brighton Township officials have revealed the Township's desire to have this property be included by a formal binding Road Maintenance Agreement between The Association and Dr. Sheng and any future owners of his property.

At the present time there are no accepted offers to purchase the property so we cannot predict the number of homesites or any configuration of parcels a future buyer may propose. We do know the property is zoned R-2 (.918 of an acre minimum lot size) and that Dr. Sheng has been assessed for 16 sewer taps. We are not asking to make this discussion contingent upon a future proposal that we cannot predict. The Township will control by Ordinance what can be done with the property in regards to density and design.

Ideally, Dr. Sheng is seeking that the Association agree that it is in every ones best interest to have any and all homesites that may be approved by Brighton Township on his property contribute their fair share in the costs necessary to improve and maintain the private roads serving those homesites.

Dr. Sheng or myself would be glad to meet with your elected Officers in the near future .  
I can be contacted at 810 844 2231.

Respectfully submitted,

  
Dan Davenport  
Associate Broker  
The Michigan Group  
6870 Grand River  
Brighton, MI, 48114

Additionally Dr. Sheng is asking all Neighbors of his property to be mindful of the fact that this is private property and not open to the public. He is not using your property and doesn't expect or desire others to be using his without his permission.

SEE REVERSE SIDE FOR PROPERTY DIAGRAM AND DESCRIPTION