

Gerrish - Lyon Utility Authority Public Information Presentation

August 27, 2021

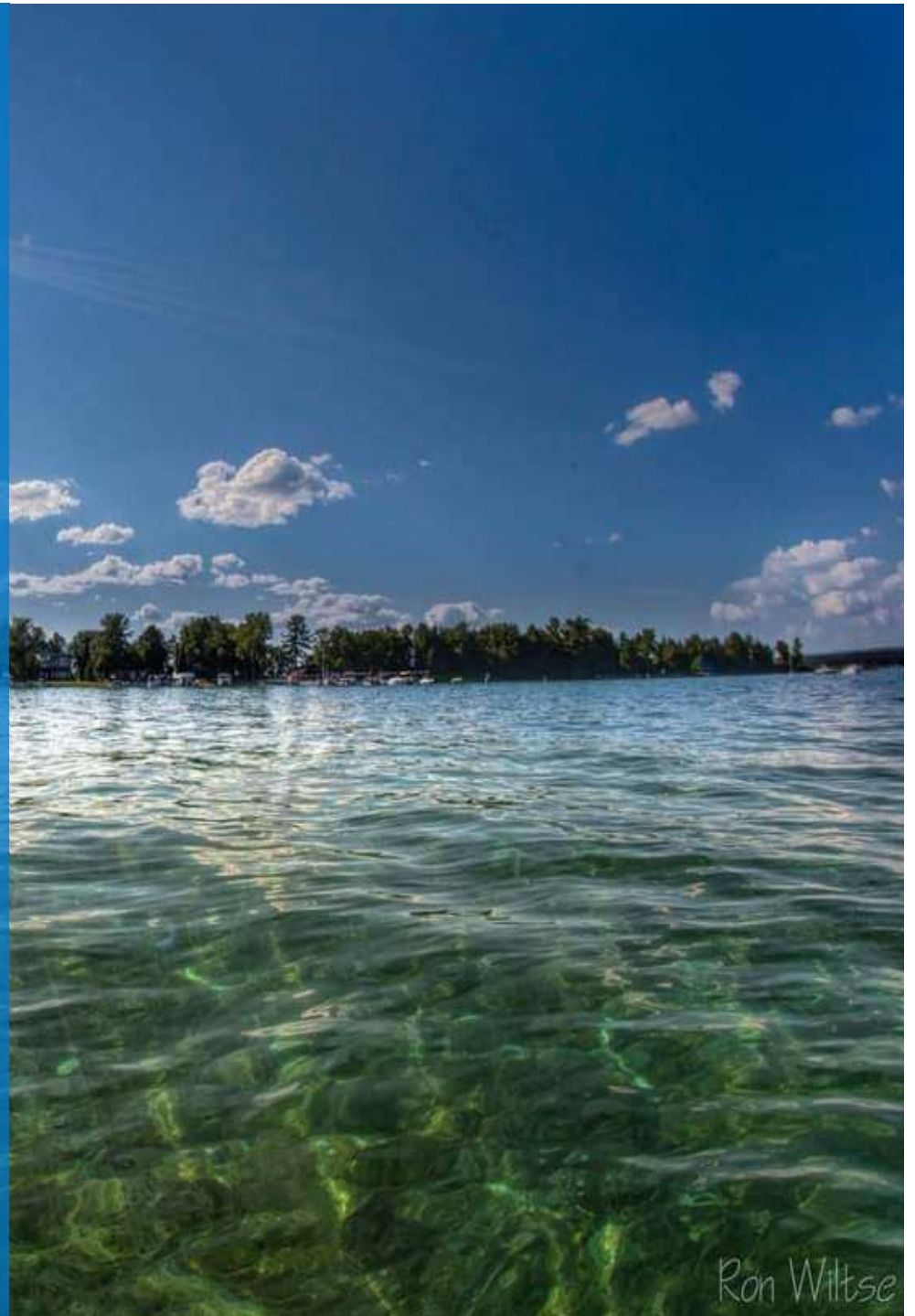


Gerrish Township
Roscommon County, Michigan



AGENDA

- GLUA Board Introductions
- Central Michigan District Health Department
- Muskegon River Watershed Alliance
- Proposed Sewer System Presentation
- Financing
- Special Assessment Overview
- Q&A Public Comments



Ron Wiltse

GLUA Board & Project History



GLUA BOARD

Dave Udy – Chairman (Gerrish Township)

Leasa Tulgetske – Secretary (Gerrish Township)

Bill Lamb (Gerrish Township)

Eric Carlson (Lyon Township)

Jerry Mckenna (Lyon Township)

Tom Metcalf (Lyon Township)

Dave Hall (Member at Large)

PROJECT HISTORY

General Milestone	Completed
Public Joint Meeting with Lyon/Gerrish	October 2018
SEARCH Grant Application	Winter 2019
SEARCH Grant Award	Spring 2019
Development of Feasibility Study	May – Oct. 2019
Public Information Meeting	October 2019
USDA Acceptance of Feasibility Study	Spring of 2020
Townships Formation of Sewer Authority	Spring 2021
Explore Potential Grant Opportunities	Summer 2021
Presentations to Local Groups: HLPOA, Higgins Lake Foundation, Higgins Lake Land Conservancy, Roscommon County Commissioners	Summer 2021

Central Michigan District Health Department



CENTRAL MICHIGAN DISTRICT HEALTH DEPARTMENT

Two letters of support dated June 4, 2021 and August 25, 2021

- “it would be expected that up to 68 percent of the 4,300 homes and businesses in the proposed sewer area would not meet one or more requirements of the current Sanitary Code.”
- “CMDHD supports the installation of public sewers in this densely populated area around Higgins Lake to eliminate the impact onsite wastewater discharge has on area groundwater and surface water resources.” — Steve King (Director of Environmental Health, Central Michigan District Health Department)

LETTERS OF SUPPORT

- “We know from prior studies at Higgins Lake that the upper springs feeding the lake are rich in nitrate and phosphorus due to the influence of onsite sewage disposal. Drinking water wells in the same aquifer as the springs would be impacted as well.” Steve King
(Director of Environmental Health, Central Michigan District Health Department)

Muskegon River Watershed Assembly





MUSKEGON RIVER WATERSHED ASSEMBLY

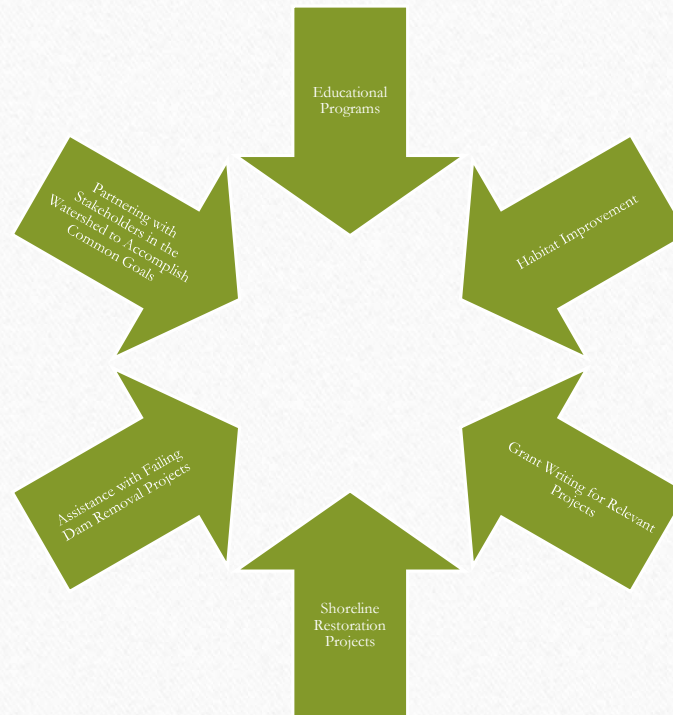
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- **Scott Faulkner: Executive Director**
 - **Marty Holtgren PhD: Principal Watershed Scientist**
 - **MRWA Founded in 1998**
 - **A Michigan 501(c)(3) Tax Exempt non-profit.**
 - **Located on Ferris State University campus in Big Rapids**

“The Muskegon River Watershed Assembly is dedicated to the preservation, protection, restoration, and sustainable use of the Muskegon River, the land it drains, and the life it supports, through educational, scientific and conservation initiatives.”

www.mrwa.org

MRWA Capabilities- What we do.

- Scientific and Economic Impact Studies, Water Quality Monitoring
- River Cleanups: Trash Bash!
- Fish Stocking
- Bank Erosion Control Projects
- Reforestation Initiatives
- Securing meaningful funding.

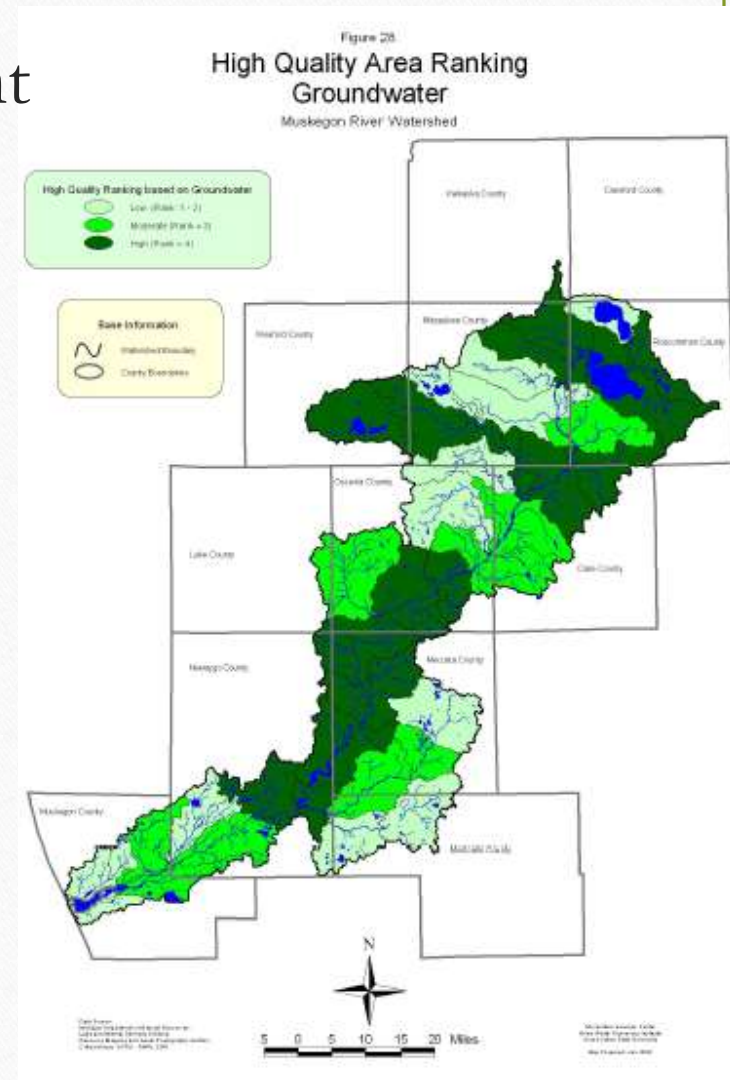


How MRWA evaluates a Project in 2021

- *Stakeholder Involvement* From the Beginning: **Three Perspectives**
 - **Scientific and Environmental Impact:** Is this project a net gain for the watershed?
 - **Economic Impact:** Does this project support and/or expand local economies?
 - **People:** How will this project effect the *residents* who will live with the proposed project?
- An MRWA approved project must indicate positive answers from *all three* of these perspectives, gain overall stakeholder approval, and balance the three perspectives.
- “*First, do no harm*”. Hippocrates 245 AD

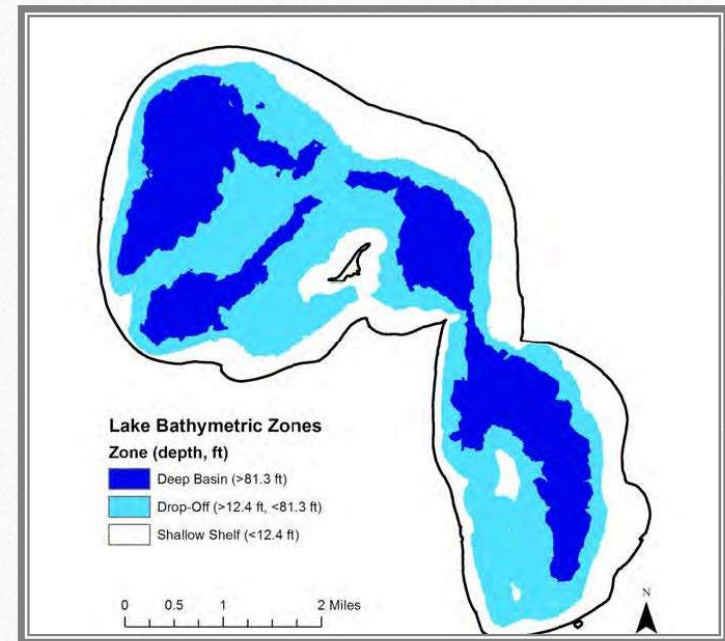
MRWA Area of Engagement

- Nine Primary Counties (12 total)
- 219 miles of Main Branch from Higgins Lake to Lake Michigan
- 90+ Dams and level control structures
- Dozens of tributaries along the way.



Ecohydrologic Studies in Higgins Lake

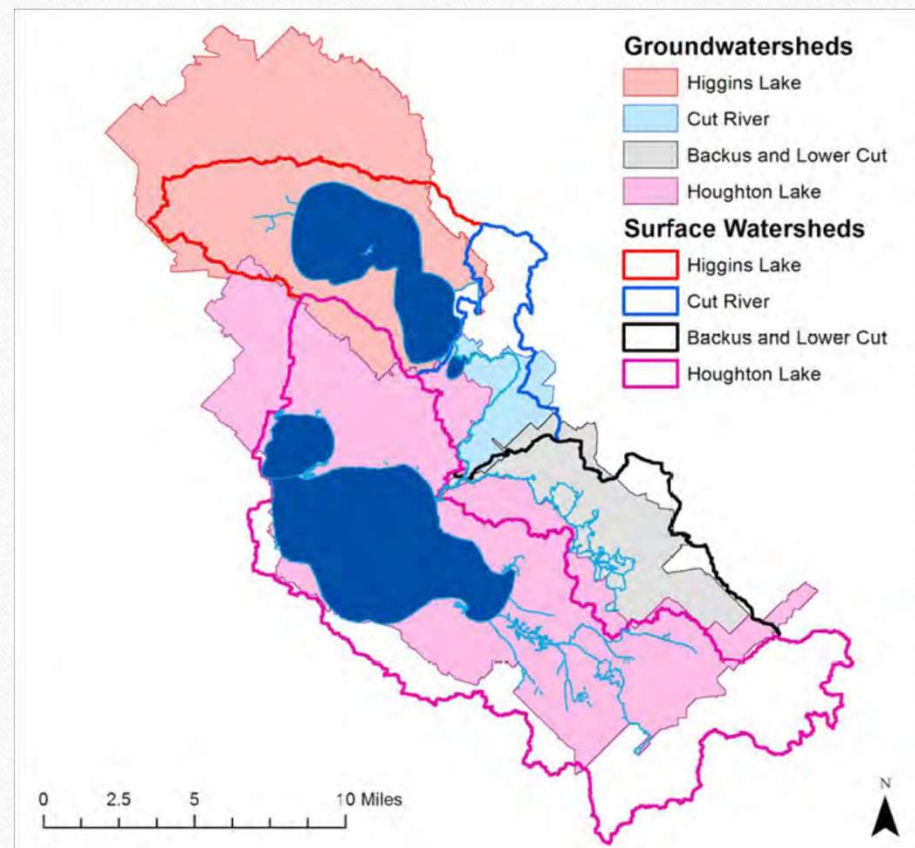
- Muskegon River Watershed Assembly
- MSU and U. of Michigan
- Michigan DNR
- Higgins Lake Property Owners Association
- Huron Pines



The Higgins Lake Watershed

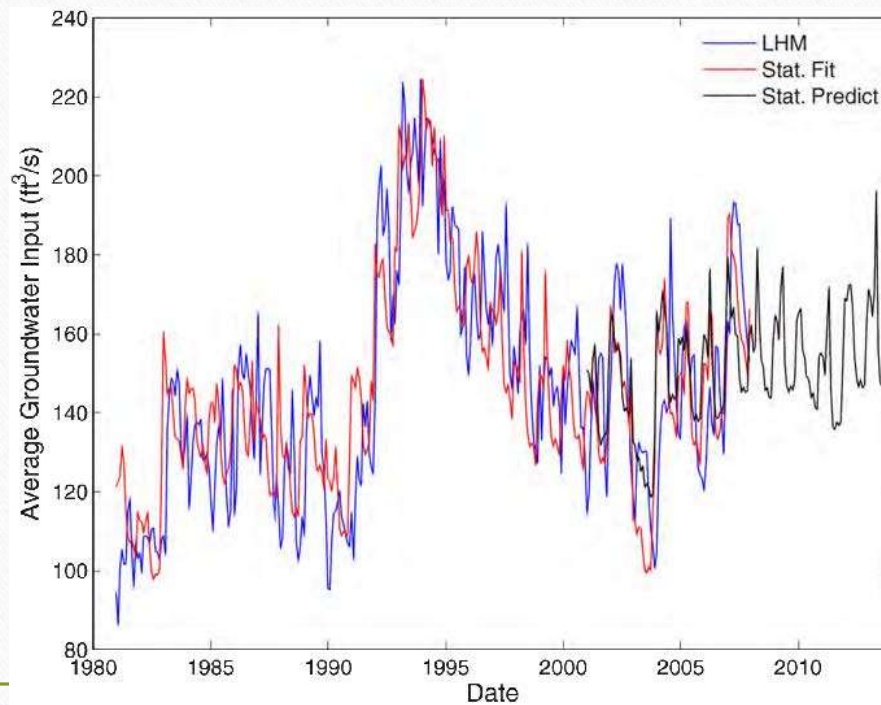
Northwest section is
groundwater gaining

*Moderately high recharge partially
because of rapid infiltration of surface
water*



Estimated Groundwater Inputs to Higgins Lake

- 64,000,000 - 141,00,000 GPD – Total GW Inflow
- 260,000 – 960,000 GPD – Sewer Flow
- *0.5% to 1% (Would even be lower when accounting for other inputs)*



Benefits to Landowners

- Decreased nutrient pollution
- Natural control of algal blooms and invasive weed beds
- Increase in desirable fishery and aquatic life in Cut River





MUSKEGON RIVER WATERSHED ASSEMBLY

Summary

The Muskegon River Watershed Assembly is dedicated to the preservation, protection, restoration, and sustainable use of the Muskegon River, the land it drains, and the life it supports, through educational, scientific and conservation initiatives."

www.mrwa.org

- **Scientific and Environmental Impact:** *Is this project a net gain for the watershed?*
 - **MRWA Summary-** Protecting the watershed starts at the source- Higgins Lake- and this project closely aligns with MRWA Mission. The project provides a substantial net gain to the watershed, while posing a low risk to the environment.
- **Economic Impact:** Does this project support and/or expand local economies?
 - **MRWA Summary:** Clean lakes, with properly engineered sanitation, support long-term property values, drive economic activity through increased employment, and add perceived value in the marketplace.
- **People:** How will this project effect the *residents* who will live with the proposed project?
 - **MRWA Summary:** Clean, sustainable water will continue to enrich the lives of all stakeholders surrounding Higgins Lake. The project is a net gain for the residents of the greater Higgins Lake area.



PROPOSED HIGGINS LAKE PUBLIC SEWER SYSTEM

Gary Bartow // Bob Wilcox, PE // Scott Hall, PE



AGENDA

- **Project Background**
- **Proposed Service Area**
- **Alternatives Considered**
- **Proposed Sewer System**

The background is a solid blue color with a pattern of overlapping, semi-transparent squares and rectangles of various sizes and orientations, creating a 3D architectural effect.

PROJECT BACKGROUND

PRIOR LAKE STUDIES

- **Maintaining the High Water Quality of Higgins Lake; (Bosserman, 1969)**
“No doubt dissolved nutrients from septic systems are reaching the lake but there is no accurate method of determining this.” (1)
- **US EPA Natural Eutrophication Survey – Higgins Lake #195; (US EPA, 1975)**
“...septic tanks were estimated to have contributed 28% of the total phosphorus load...” (2)
- **A Water Quality Study of Higgins Lake, Michigan; (UofM, 1984)**
“Domestic sewage contributions have been estimated to be approximately 17% of the total phosphorus budget” (33)
“Lakeside septic systems are likely to be major sources of nutrients to the Higgins Lake shoreline...as much as 85% of the nitrogen and 75% of the phosphorus that enters each septic system may eventually reach the lake” (36)
“Septic systems may contribute as much as 60% of the total nutrient load to lakes when surrounding soils are poor and densities of nearshore dwellings are high” (37)
- **Effects of Residential Development on the Water Quality of Higgins Lake, Michigan 1995-99 (USGS, 2001)**
“Septic Systems are the most likely source of increases in phosphorus and nitrogen in lake and groundwater near shore.” (27)
- **Changes in nearshore water quality from 1995 to 2014 and associated linkages to septic systems in Higgins Lake, MI; (MSU, Martin, Kendall, Hyndman, 2014)**
“Septic systems significantly influence NH₃ concentrations (loading ammonia to the nearshore) and Boron concentrations, as expected of a septic indicator. Septic fluxes (or the combination of septic systems and high groundwater) control groundwater TP inputs. Surface water concentrations of both TP and NH₃ are correlated to both groundwater inputs and septic counts.” (56)

Many Studies over 50+ years all conclude septic systems are negatively impacting the lake.

PRIOR LAKE STUDIES

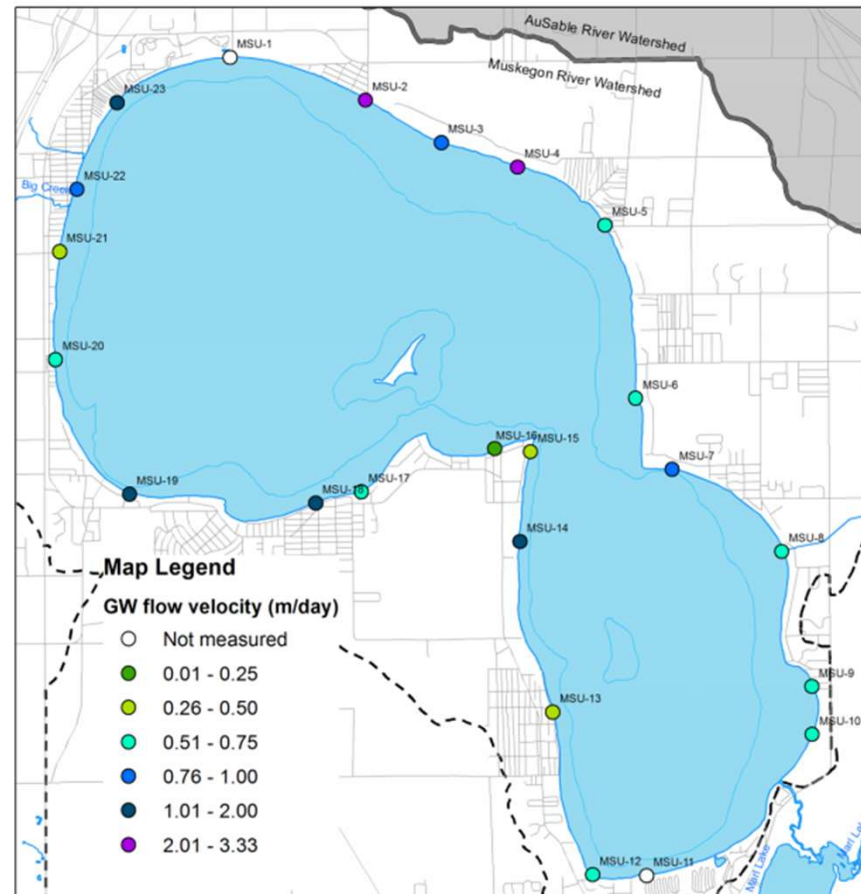
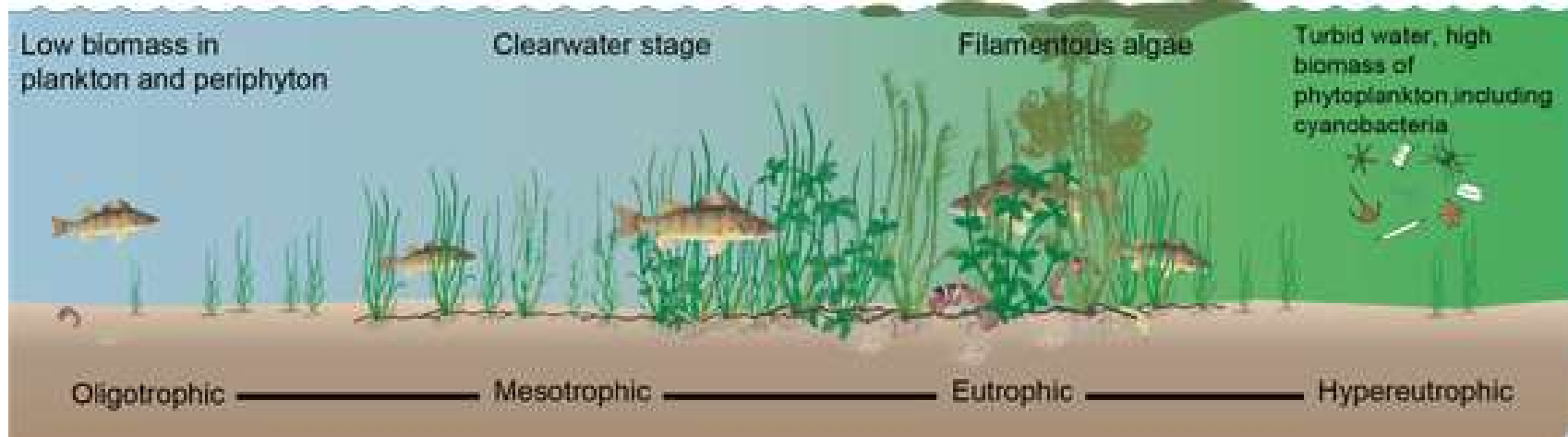


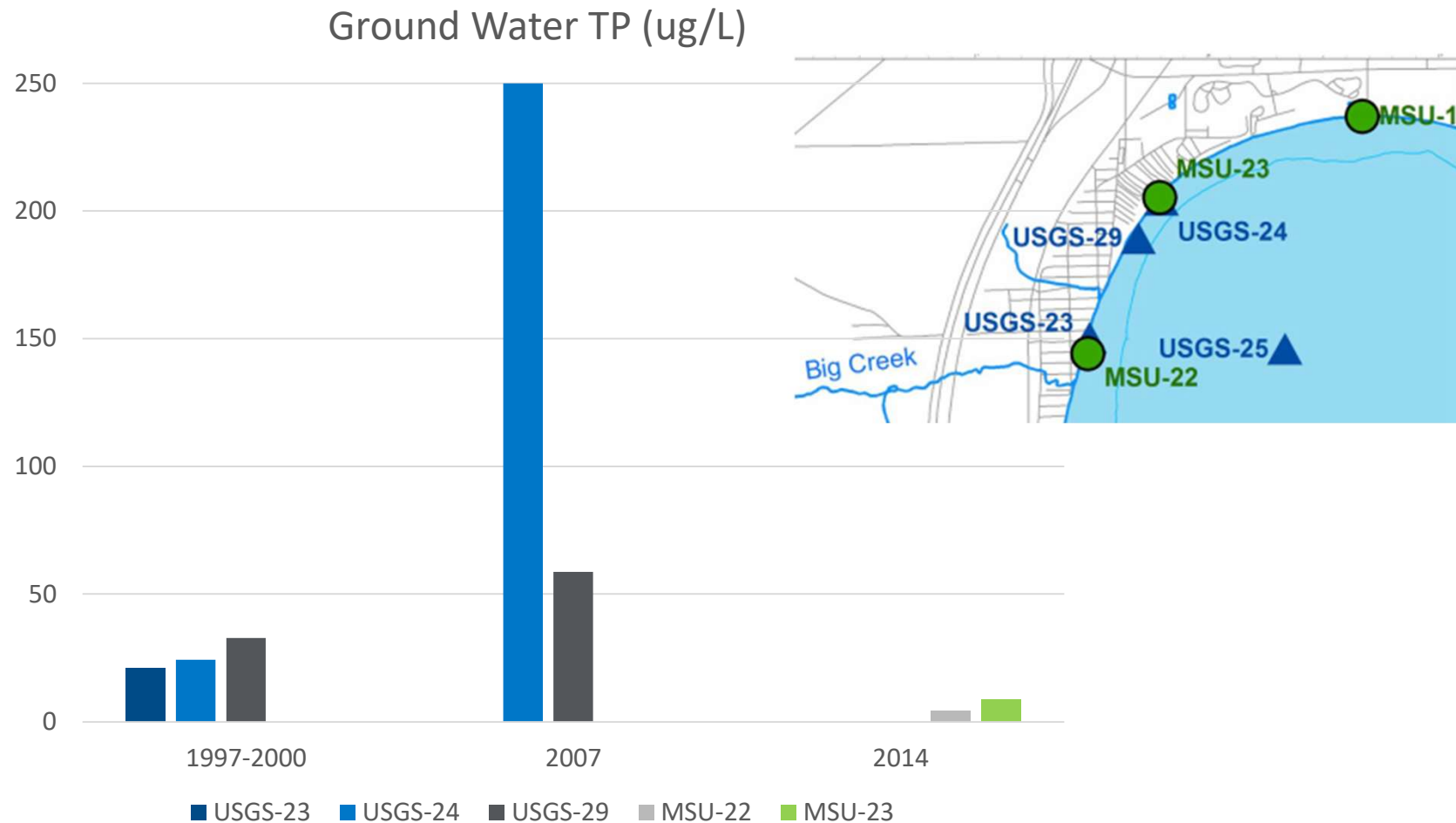
Figure 4. Map of measured groundwater flow velocities from seepage meters.

Changes in nearshore water quality from 1995 to 2014 and associated linkages to septic systems in Higgins Lake, MI (2014 Martin)

TROPHIC STATE INDEX



CAMP CURNALIA CASE STUDY

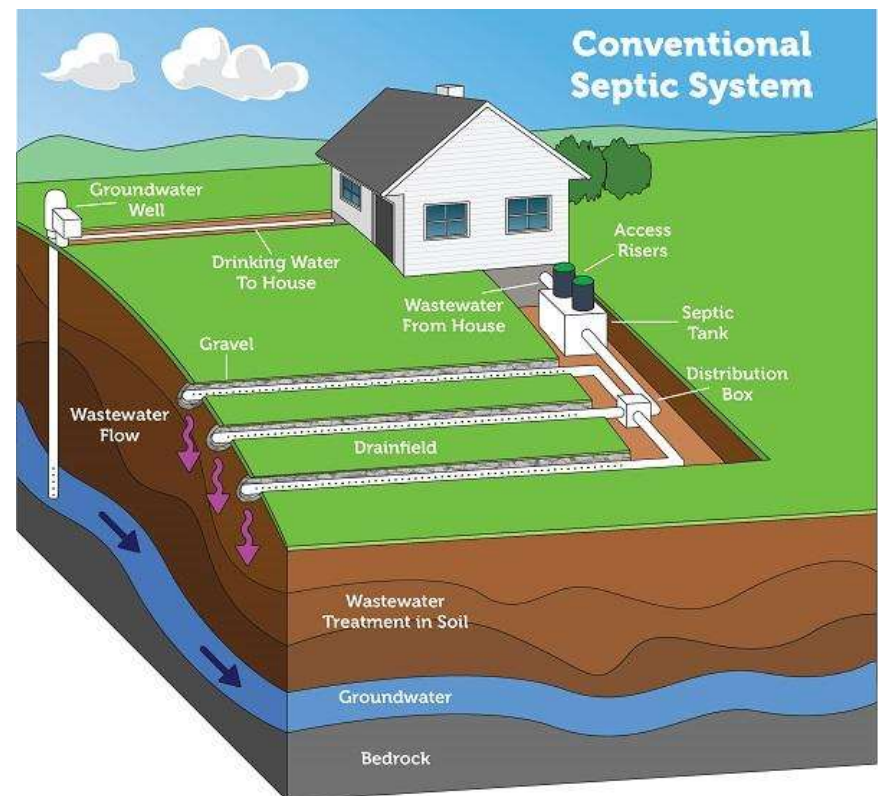


Changes in nearshore water quality from 1995 to 2014 and associated linkages to septic systems in Higgins Lake, MI (2014 Martin)

IDENTIFYING THE PROBLEM

Typical Septic System and connecting conditions

- High (shallow) water table
- Soil type – Poor soils (clay-muck or excessively drained sand)
- Dense Development
- Proximity to lake



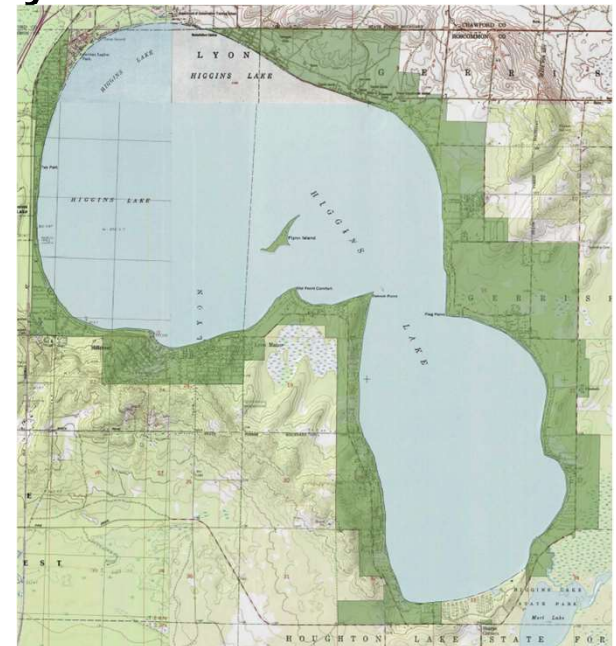
Please note: Septic systems vary. Diagram is not to scale.

- 100' minimum distance from lake and creek
- Distance to wells: 50' for residential, 75' for commercial

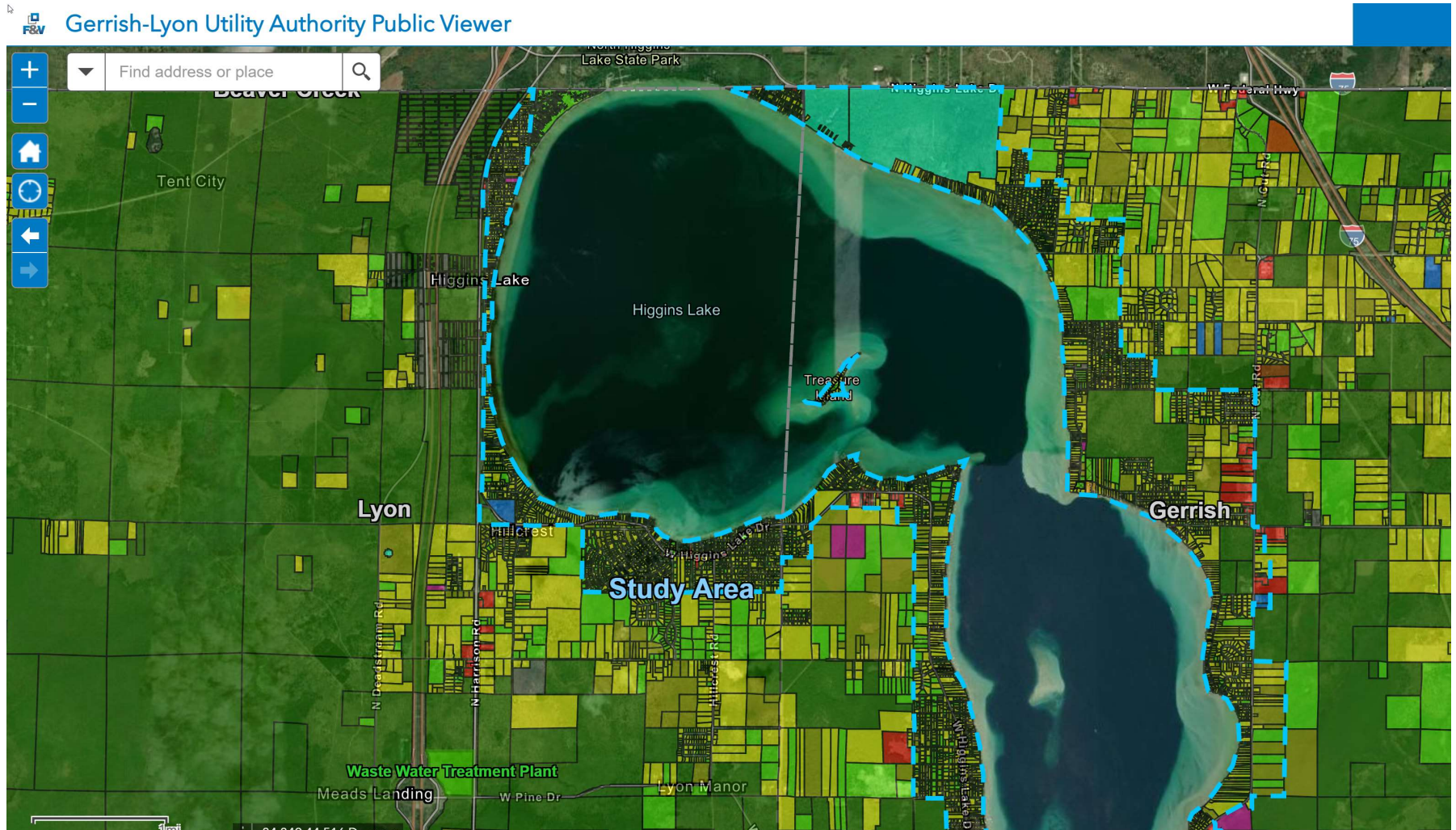


PROPOSED SERVICE AREA

- How was the Service Area identified:
 - Potential areas influencing water quality
 - Health and safety
 - Township workshops
- Areas that will benefit from community sewer due to:
 - High (shallow) water table
 - Soil type – Poor soils (clay-muck or excessively drained sand)
 - Dense Development
 - Proximity to lake



SERVICE AREA MAP



<https://fveng.maps.arcgis.com/apps/webappviewer/index.html?id=f98e9b84e0c24bc3bc80373167914686>

BENEFITS OF PROPOSED PUBLIC SEWER SYSTEM

- Reduces health risk of contamination of shallow drinking water wells
- Lake water quality improvements
 - A controllable way to reduce nutrient loading impacting lake health
 - Upper branch of Muskegon River watershed
- Removal of septic systems
 - Eliminates aging, undersized and improperly functioning septic systems
 - Eliminates impractical control for inspection/enforcement of privately owned septic systems
 - Eliminates performance concerns due to seasonal use

PROPOSED PUBLIC SANITARY SEWER SYSTEM

ALTERNATIVES EXPLORED

- Collection System
 - Gravity Sewer with Low Pressure component
 - Complete Low-Pressure System
 - Grinder System
 - Septic Tank Effluent Pumping Chamber (STEP)

GRAVITY VS. LOW PRESSURE

Gravity Sewer

- Higher risk of inflow & infiltration
- Open trenching is disruptive & requires more restoration
- Dewatering costs are high and can be unpredictable
- Terrain around Higgins Lake requires expensive pump stations

Low pressure Sewer

- No inflow & infiltration
- Directional drilling minimizes disruption to property
- Trenchless technologies require minimal dewatering
- Each property has its own onsite pump system

CONSTRUCTION

Maximize this

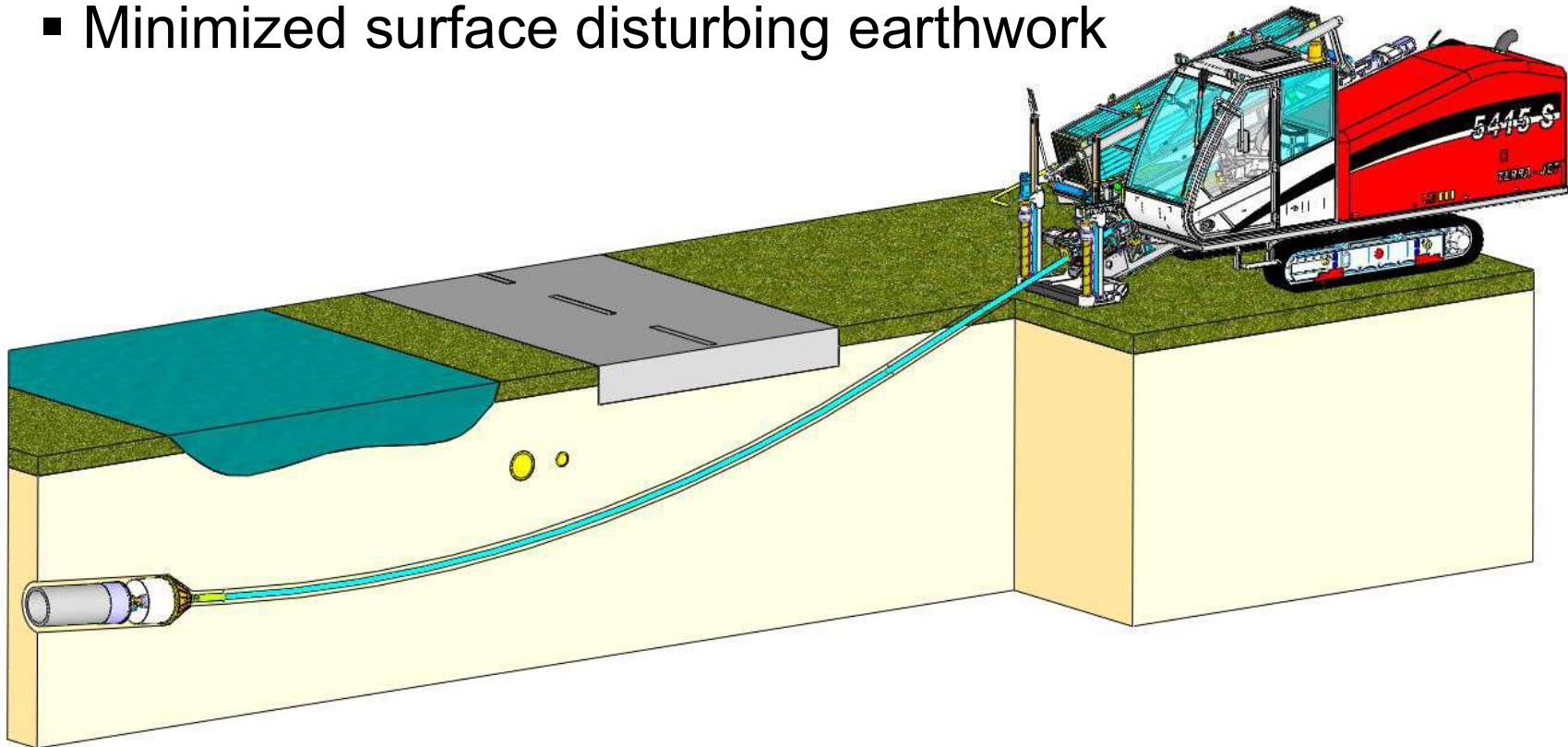


Minimize this



CONSTRUCTION

- Utilize Trenchless Technology
- Directional Drilling
- Minimized surface disturbing earthwork



STEP VS. GRINDER SYSTEMS

Septic Tank Effluent Pumping System

- Solids pumped by the Sewer Authority, discharged at the WWTF
- Lower O&M
- Less impact by seasonal use
- Greater storage volume

Grinder Systems

- Pumps convey both solids and liquid
- Higher O&M
- Potential grease and solids buildup
- Small storage volume

PROPOSED ALTERNATIVE - STEP

120V power supply from home

GLUA Responsibility

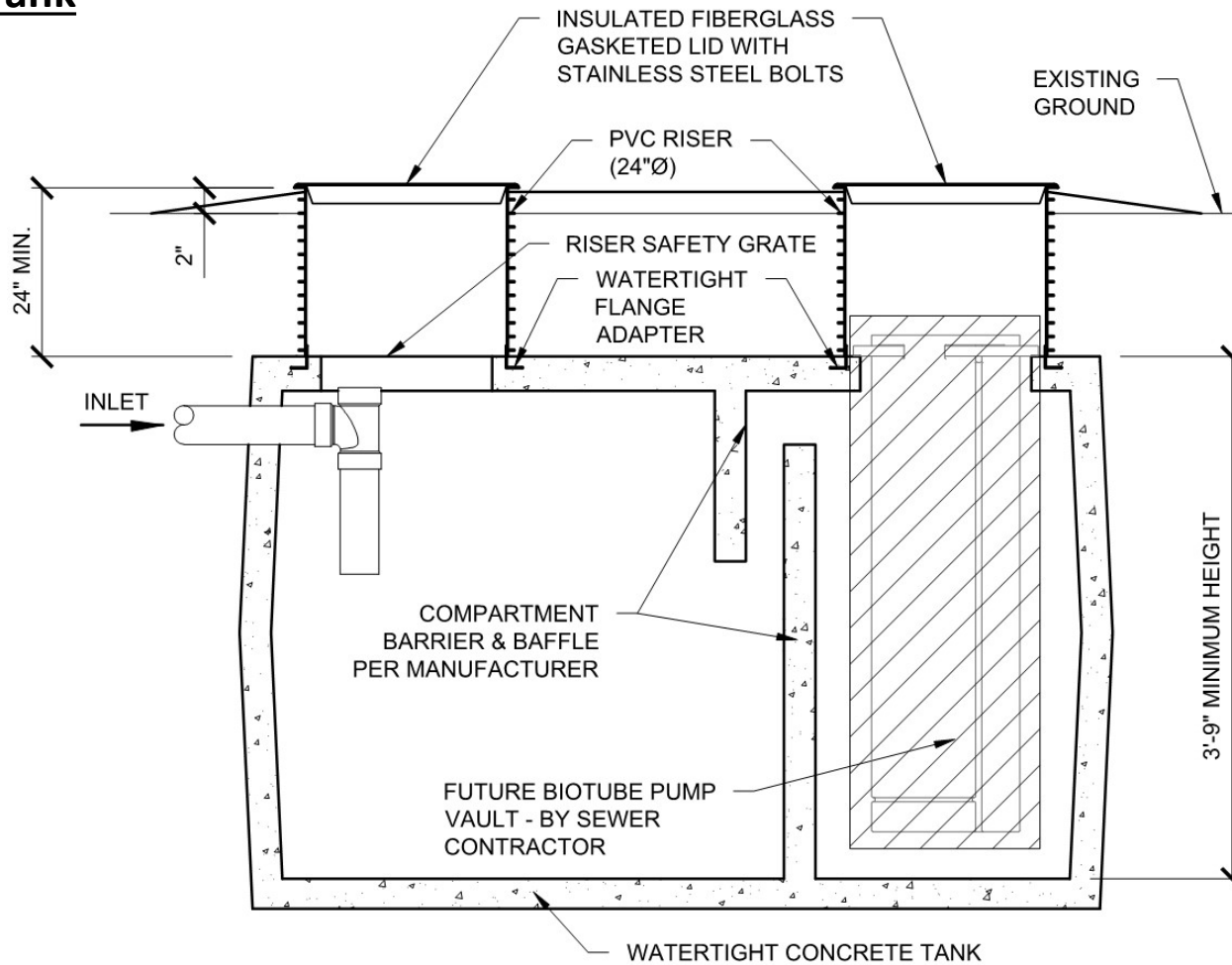
Property Owner Responsibility

TO
WWTP



PROPOSED ALTERNATIVE - STEP

STEP Tank



COLLECTION SYSTEM O&M

- **Responsibility & Maintenance:**
 - ***Property Owner:***
 - Pipe from house to tank
 - Electric cost for pumping
 - ***Utility Authority:***
 - Tank, pump, pump controls and all downstream piping
 - Utility will periodically pump tanks, operate & maintain system, including pump replacement as needed
- **Life of System:**
 - 75 -100 years for most infrastructure
 - 15+ years on pumps and misc. components (built into the annual operation of system)

The background is a solid blue color with a pattern of overlapping, three-dimensional geometric shapes, primarily squares and rectangles, creating a sense of depth and architectural structure.

PROPOSED TREATMENT SYSTEM

EXISTING SEPTIC SYSTEM

Water Quality Conditions

	Raw Wastewater	Septic Tank Discharge	Municipal WWTP Treated Water
Nitrogen	60 ppm	60 ppm	<5 ppm
Phosphorus	10 ppm	8.1 ppm	<1 ppm

Source: EPA Onsite Wastewater Treatment System Manual, 2002 EPA/625/R-00/08
Crites and Tchobanoglous, Small and Decentralized Wastewater Management
Systems, McGraw-Hill, 1998.

TREATMENT SYSTEM OVERVIEW

- Designed to treat summertime flow rates
- Certified Operator in charge of treatment
- Effluent quality monitored for compliance by EGLE
- High quality water discharged to groundwater far away from the Lake
 - Nitrogen <5 ppm
 - Phosphorus <1 ppm

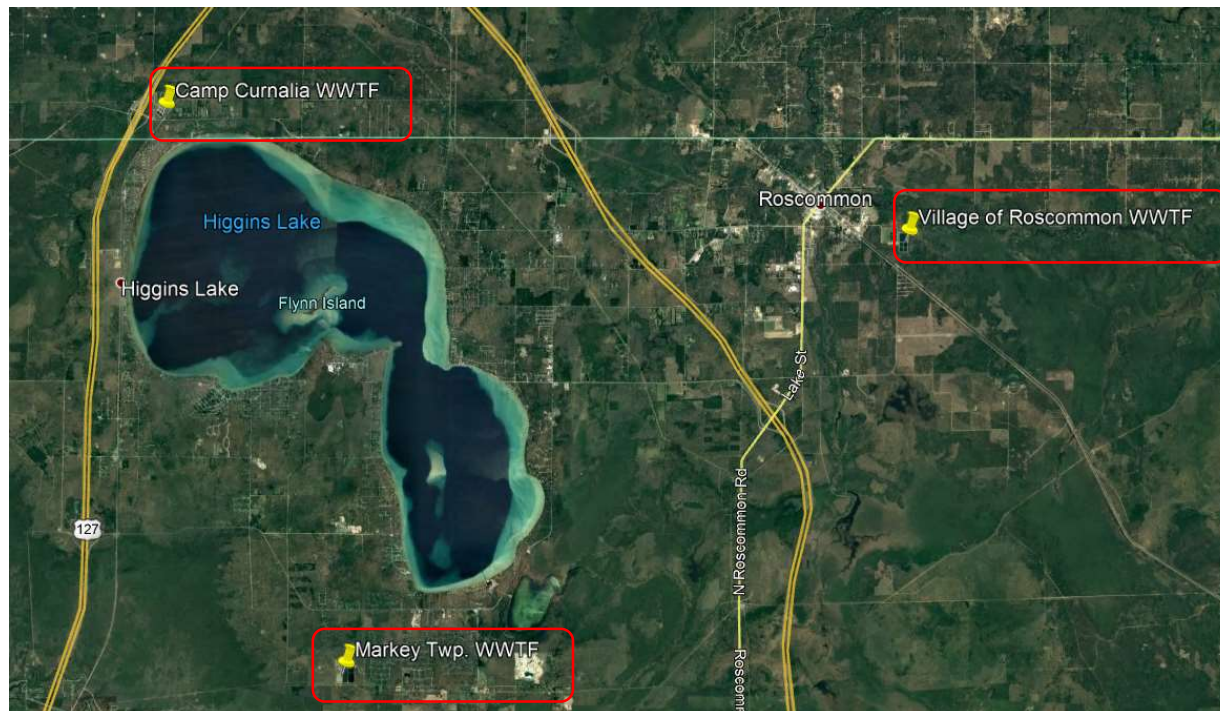
ALTERNATIVES EXPLORED

Wastewater Treatment Systems

- Regional WWTF
- Lagoon Treatment Facility
- Mechanical Wastewater Treatment Plant

ALTERNATIVE 1: REGIONAL TREATMENT SYSTEM

- Existing Regional Facilities
 - Camp Curnalia
 - Markey Township
 - Village of Roscommon
- Significant expansion of existing facilities is not economically feasible.



ALTERNATIVE 2: LAGOON TREATMENT FACILITY

- Collection system delivers flow to large earthen basins.
- Large land area required.
- Potential for seasonal odors
- Higher capital costs vs Mechanical WWTF
- Lower operating costs vs Mechanical WWTF



Lagoon Treatment Overview

ALTERNATIVE 3: MECHANICAL TREATMENT PLANT

- Collection system delivers flow to concrete treatment and settling tanks
- Small treatment facility footprint
- Operational flexibility for seasonal flows
- Stringent EGLE Water Quality Testing



Oxidation Ditch

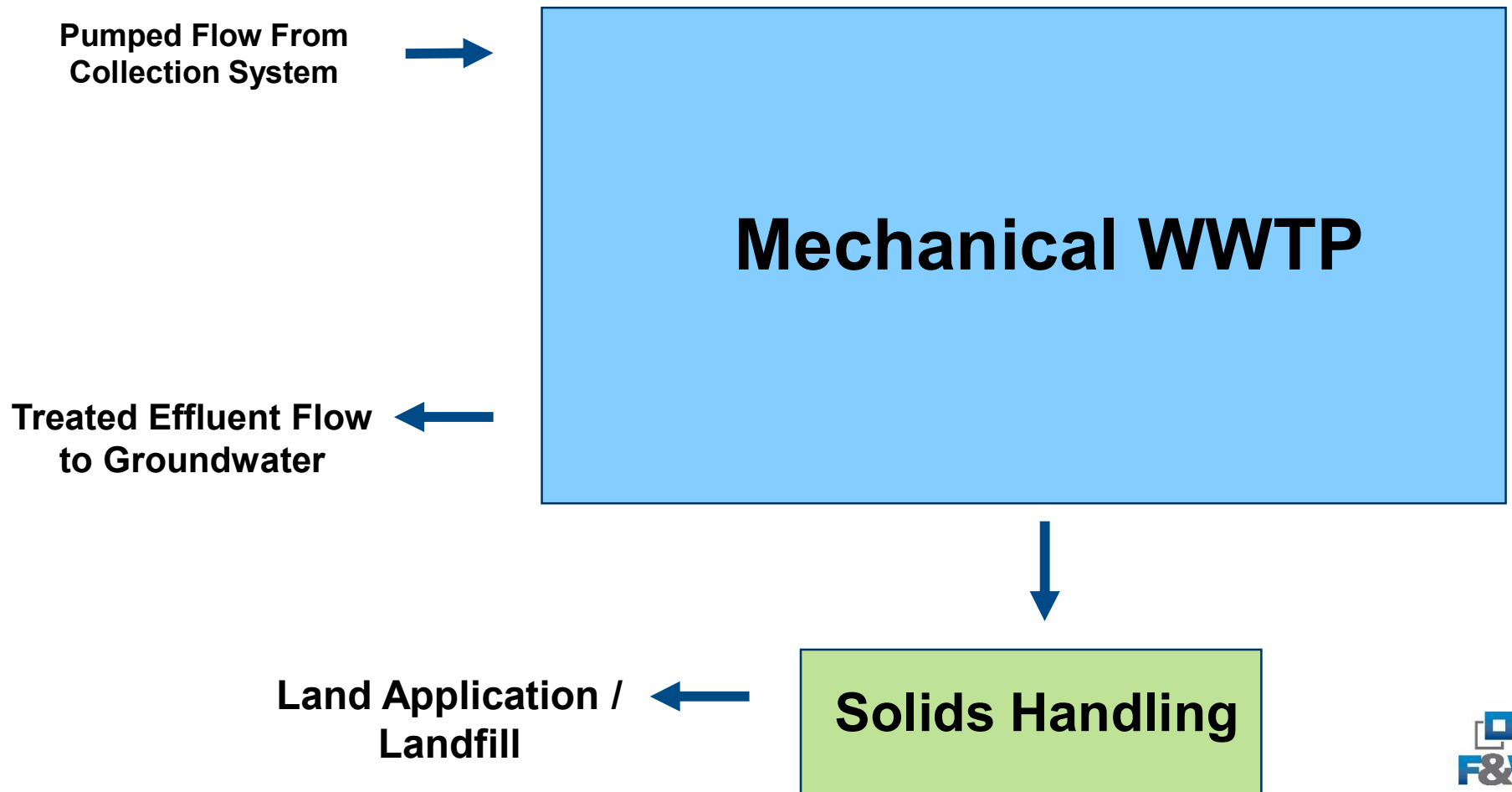


Mechanical Treatment Overview

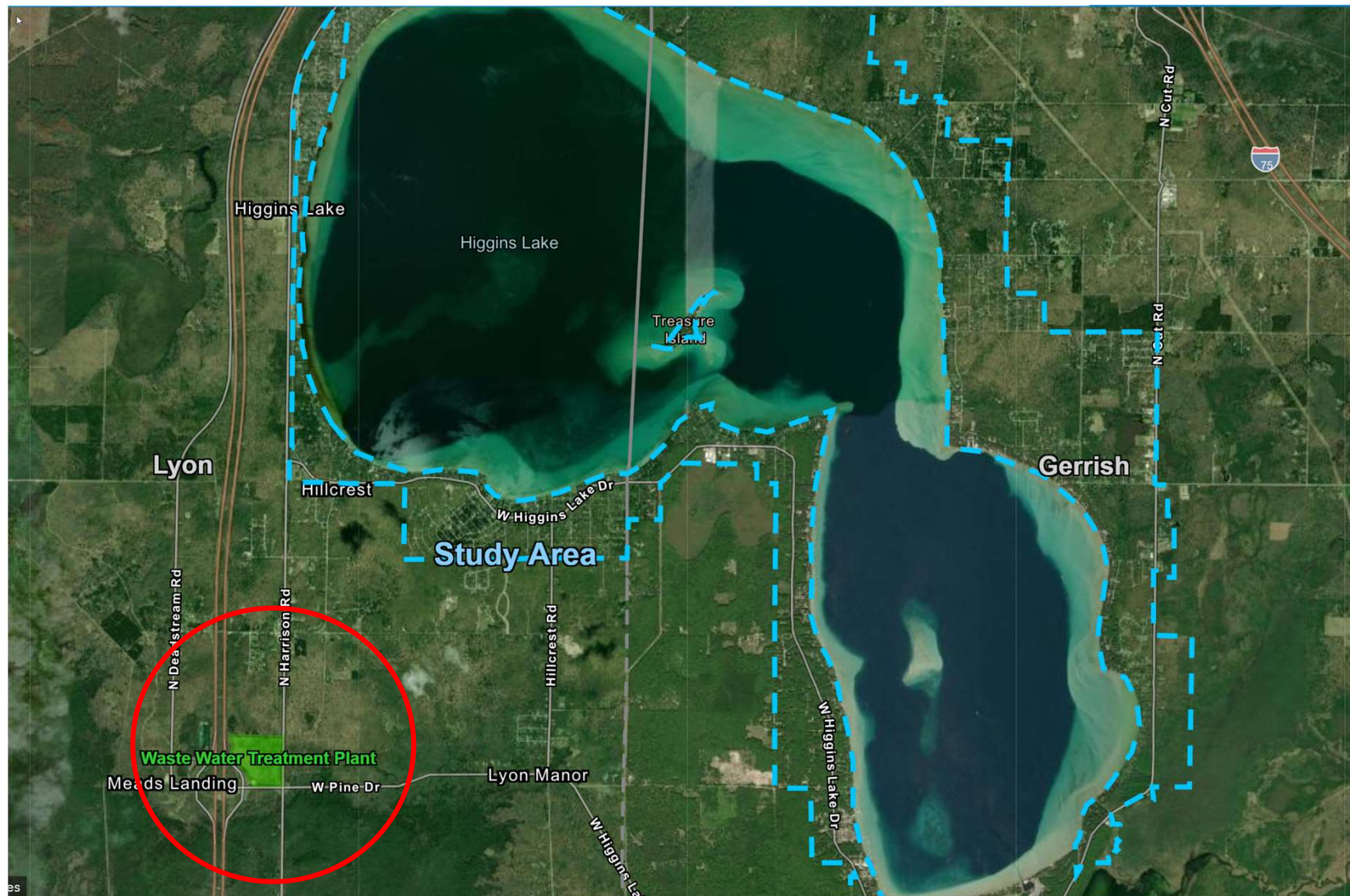


Rapid Infiltration Basin

SELECTED TREATMENT ALTERNATIVE



WASTEWATER TREATMENT PLANT LOCATION



FINANCIAL/LEGAL CONSIDERATIONS



CURRENT PROJECT COST ESTIMATE

	BUDGET
Collection System	\$80.3 M
Wastewater Treatment Plant	\$20.8 M
Non-construction Costs	\$18.4 M
Contingencies	\$10.5 M
TOTAL PROJECT BUDGET:	\$130 M

PROJECT FUNDING

- GLUA is pursuing funding through USDA Rural Development.
- Additional potential funding resources:
 - EGLE Clean Water State Revolving Fund
 - Potential Grants
 - Pending Infrastructure Bills
 - Participation with State and Federal Partners
- Meetings with
 - Michigan Senator Curt Vanderwall
 - US Congressman John Moolenaar
 - US Congressman Jack Bergman

SPECIAL ASSESSMENT PROCESS

- Act 188 of the Public Acts of Michigan 1954
- Who can initiate the Special Assessment Proceedings?
 - Township Boards
 - Public Petition – 51% of landowners
- Step 1: Resolution No.1
 - Each Township Board adopts resolution tentatively declaring its intent to make the sewer improvements, tentatively designating the district and setting a public hearing on the necessity of the improvement and the district.
- Step 2: Notice of Public Hearing
 - Mailing sent to all property owners in district and published in the paper.

SPECIAL ASSESSMENT PROCESS

- Step 3: Public Hearing No.1
 - Township Board must hear any objections to the proposed improvement and the tentative district. This is a hearing on the necessity of the project, not on the amount of the assessment.
 - Property owners can give input by petitioning prior to or at the meeting.
- Step 4: Resolution No.2
 - If the Township Board decides to proceed, it adopts a resolution determining to make the improvement, approving the plans, costs estimates and petitions, if any. The resolution also determines the district, its term and directs the Supervisor to make the special assessment roll.
- Step 5: Resolution No.3
 - When the special assessment roll is reported to the Board, the Board receives the roll and adopts a resolution setting a public hearing on the roll.

SPECIAL ASSESSMENT PROCESS

- Step 6: Notice of Public Hearing
- Step 7: Public Hearing No.2
 - Property owners and the public may comment on the Special Assessment Role.
- Step 8: Resolution No.4
 - The Township Board adopts a resolution confirming the roll
- Step 10: Roll Becomes Final

SPECIAL ASSESSMENT PROCESS

- Assessment Financing
 - Homeowners will be able to finance their assessments over time at a very low interest rate.
 - Payment assistance programs may be available to qualifying households. Additional information will be posted on the Township websites.

NEXT STEPS

General Milestone	Est. Completion
Environmental & Historic Reviews	Summer 2021
Prepare applications for funding	Fall 2021
Begin Special Assessment Process	Fall 2021
USDA Application Submitted	Fall 2021
Receive funding commitments	Fall 2021/Spring 2022
Special Assessment Process	Fall 2021 – Spring 2022
Begin Design	Spring 2022
Advertise for bids	Winter 2023
Construction	Spring 2023 - Fall 2026

QUESTIONS

