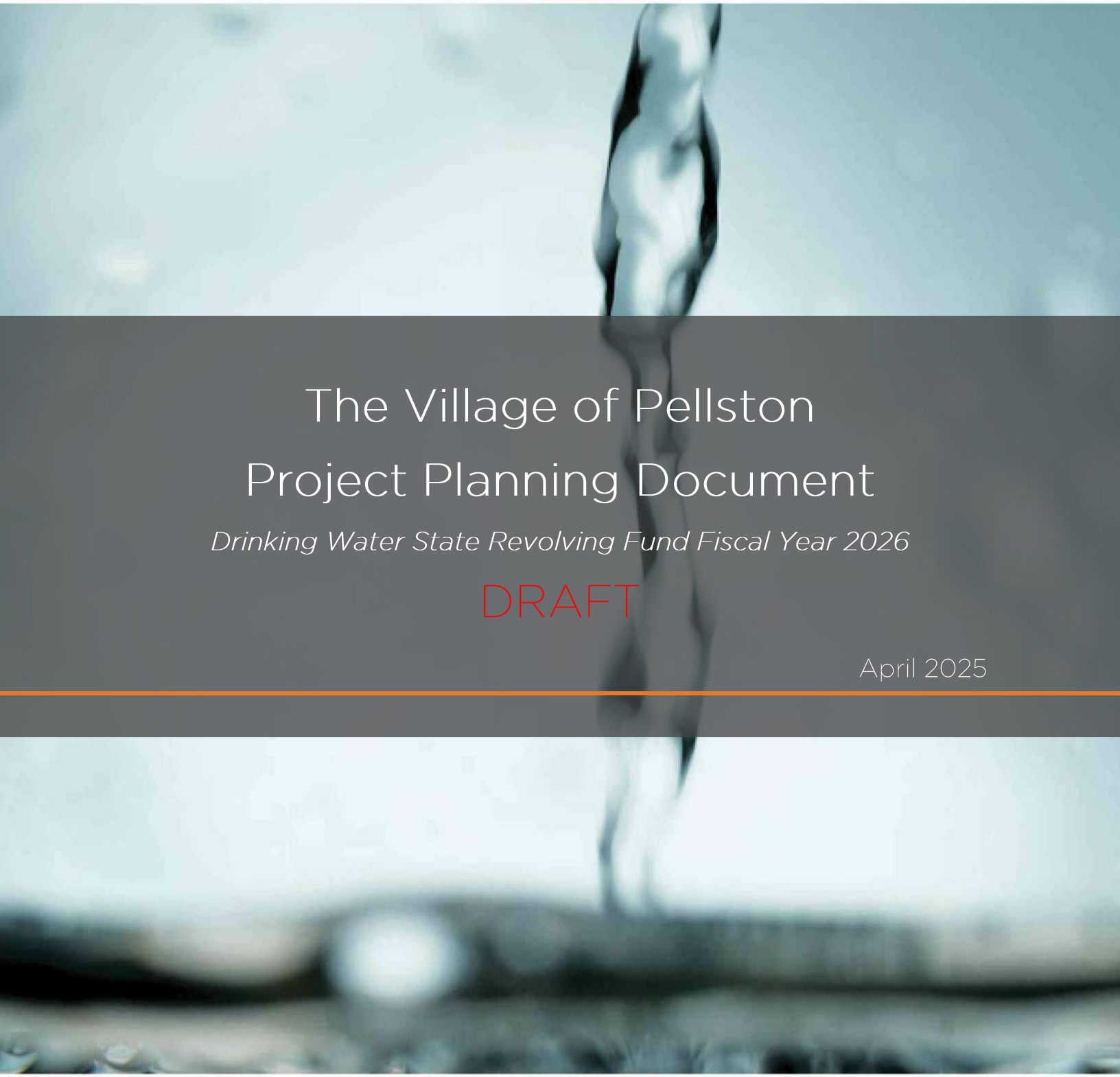

The Village of Pellston
Project Planning Document

Drinking Water State Revolving Fund Fiscal Year 2026

DRAFT

April 2025

OHM Advancing Communities®

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ABBREVIATIONS

APG	Affordability and Planning Grant
AFFF	aqueous film forming foam
ARI	adverse resource impact
$CaCO_3$	calcium carbonate
DWSRF	Drinking Water State Revolving Fund
EGLE	Michigan Department of Environment, Great Lakes, and Energy
EPA	Environmental Protection Agency
FY	fiscal year
GPCD	gallons per capita per day
GPD	gallons per day
GPM	gallons per minute
ITA	Intent to Apply
MAHI	median annual household income
MCLs	maximum contaminant levels
MDHSS	Michigan Department of Health and Human Services
MDNR	Michigan Department of Natural Resources
MDOT	Michigan Department of Transportation
MGD	million gallons per day
MNFI	Michigan Natural Resources Inventory
NAAQS	National Ambient Air Quality Standards
Act 451 of 1994 or NREPA	Natural Resources and Environmental Protection Act
NaOCl	sodium hypochlorite
NLAA	not likely to adversely affect
O&M	operation and maintenance
PLN	Pellston Regional Airport
PFAS	per- and polyfluoroalkyl substances
PFHxS	perfluorohexane sulfonate
PFNA	perfluorononanoic acid
PFOS	perfluorooctane sulfonic acid
POU	point-of-use
POE	point-of-entry
REU	residential equivalent unit
SHPO	State Historic Preservation Office
USFWS	United States Fish and Wildlife Services
USGS	United States Geological Survey
Village	Village of Pellston
W&W	Williams and Works
WIIN	Water Infrastructure Improvement for the Nation
WTP	water treatment plant

I. INTRODUCTION

The Village of Pellston (Village) is submitting this Project Planning Document to apply for a Drinking Water State Revolving Fund (DWSRF) low-interest loan to fund the implementation of a municipal water system. The municipal water system will include a new water supply well, water treatment plant (WTP), system storage, and distribution network.

This Project Planning Document has been developed using the DWSRF Project Planning Document Preparation Guidance from the Michigan Department of Environment, Great Lakes, and Energy (EGLE), released in January 2023.

An Intent to Apply (ITA) form was submitted to EGLE on October 24, 2024. The ITA form included a description of the proposed projects and preliminary costs. The Village, OHM Advisors, and EGLE met virtually on December 9, 2024, to discuss the projects contained in this Project Planning Document.

II. BACKGROUND

A. STUDY AND SERVICE AREA

The Village is located within Emmet County, Michigan. The Village is located within two Townships, McKinley Township to the north and Maple River Township to the south. The principal corridor through Pellston is US-31, which passes through the center of the Village. Maple River runs through the southwest corner of the Village, between the Pellston Pioneer Park and the Philip J Braun Nature Preserve. The Village is approximately 1.95-square miles in area and had a population of 774 at the time of the 2020 Census. The Village currently does not have any public drinking water or sanitary sewer utilities. Village residents and businesses currently utilize groundwater through private drinking water wells as their water supply with point-of-use (POU) filter systems and septic fields for sewage disposal.

B. BACKGROUND

In January 2020, per- and polyfluoroalkyl substances (PFAS) were detected by high school students utilizing Freshwater Future PFAS sampling kits in a private drinking water well. PFAS was detected at a level that exceeded EGLE maximum contaminant levels (MCLs) for perfluorooctane sulfonic acid (PFOS) and perfluorohexane sulfonate (PFHxS). A resampling by EGLE confirmed that PFAS existed at levels that exceeded the states maximum MCLs, which kicked off contamination investigation activities.

In February 2020, discussions with Emmet County regarding the use, storage, and handling of aqueous film forming foam (AFFF) at the Pellston Regional Airport (PLN) began, as well as more extensive residential water well sampling and monitoring efforts. It was confirmed that the use of AFFF during training activities was performed annually at PLN and EGLE requested that the County complete response activities, as outlined under Section 201114 of Part 201, to assess the PFAS contamination at PLN. Emmet County completed Phase I and Phase II investigation activities at PLN through the Michigan Department of Transportation (MDOT) PFAS grant. Through these investigations, EGLE identified the County as the responsible party of contamination and thus the liable party to continue response activities outlined in Part 201.

In April 2022, EGLE approved the Emmet County Response Activity Plan, which details the additional investigation activities and their plan for PFAS impacted soil management. The County is currently piloting remediation options.

As of August 25, 2022, 217 private drinking water wells have been sampled with 124 of them having PFAS detections and 57 of them returning PFAS concentrations exceeding the State's PFAS MCLs that go into effect in 2027. The United States Environmental Protection Agency (EPA) established national drinking water standards for PFAS at different concentrations than the EGLE MCLs. According to the EPA MCLs, there were 87 wells that exceeded the maximum concentrations as of August 25, 2022. Residential water well testing continues through the Michigan Department of Health and Human Services (MDHSS) when requested by the resident.

POU filter systems were offered as a temporary solution for residents that have detectable levels of PFAS chemicals in their private drinking water wells. POU systems are water filtration systems that connect directly to one singular fixture in a home. However, the public has not been satisfied with the low flow rate of 0.7 gallons per minute (GPM) from the filters. There are also concerns that residents are not replacing filters following the MDHHS guidelines and/or disconnecting them due to the low flow rate they provide.

On September 27, 2022, the Village received a Water Infrastructure Improvement for the Nation (WIIN) grant from EGLE through the Environmental Protection Agency (EPA) to complete a drinking water feasibility study to determine the most viable option for providing safe drinking water to the residents of Pellston. The Village also received an Affordability and Planning Grant (APG) in the spring of 2024. This grant was awarded to support planning and preliminary design of a municipal water system, perform a regionalization analysis, perform a preliminary rate study, and develop a DWSRF Project Planning Document and application. These grants have allowed the Village to advance further in the feasibility study and design phase, but there is still a funding gap for design and construction of a municipal water system. As of April 2025, the following work has been completed through the feasibility study and WIIN grant:

- Project Initiation & Data Gathering
    - Obtained past studies and available information related to geology, hydrogeology, water quality testing and aquifer testing from the Village and other attainable sources.
    - Obtained necessary updated planning information from the Village to perform population projections and water demand calculations.
    - Worked with Village to determine desired fire protection rates per zoning class. Provide typical fire protection rates per zoning class for Village's consideration.
- Water Supply Alternatives
- Service Area Evaluation
    - Identified initial and ultimate water service areas.
    - Discussed system phasing for ultimate system expansion.
    - Determined likelihood of regional collaboration.
    - Assess the geology, including floodplains and wetlands, of the service areas using available well records, USDA Natural Resources Conservation Service data, US Fish and Wildlife Service Wetlands Mappers, aerial photographs, and other attainable sources of information. This assessment will identify areas of limitations within the service areas.
    - Identified land use and zoning within the service areas using available mapping.
    - Estimated number of users for initial and ultimate service areas using available parcel and zoning data as well as planning documents provided by the Village.
    - Reviewed available contour/elevation data to understand the topography of the service areas.
    - Developed service area maps with identified phasing route.
- Water Demand Estimates
    - Obtained planning data for service areas including population trends, existing population and estimated 5 and 20-year projected population values.

    - Calculated estimated water demands per service area based on population data and industry standards. This includes existing groundwater use, present and projected average daily demands, maximum daily demands, peak hourly demands, and fire flow demands.
- Source Water Evaluation
    - Identified potential well sites.
- Water System Concept Design
    - Provided preliminary water main layouts for the service areas and transmission to well source.
    - Estimated water main diameter needs for the service areas based on estimated demands and fire protection requirements.
    - Determined storage tank needs and ideal storage tank location(s) if the Village elects to produce, treat, and supply their own water. Estimated demands and desired fire protection rates will be utilized to conceptually size the storage tank.
    - Performed Phase I geotechnical investigation including soil borings for the distribution system and anticipated water tank location.
    - Performed topographic survey of the project limits identified by the conceptual layout of a community water system.
    - Prepared approximately 30% concept designs for the public water supply system.
    - Finalized regionalization analysis.
- O&M and Capital Estimates
    - Developed capital cost and O&M cost summary for source alternatives.
    - Developed system maps showing proposed project locations.
- Funding Opportunity Analysis
    - Drafted DWSRF Project Planning Document.
    - Applied for and received APG.

The following upcoming work is planned under the WIIN Grant and APG:

- Water System Planning and Design
    - Perform exploratory well drilling and pumping testing.
    - Continue geotechnical evaluation.
    - Finalize topographical survey of the project limits identified by the conceptual layout of a community water system.
    - Continue ongoing system planning
- Planning-Level User Fee Analysis
    - Estimate expenditures including capital costs and improvements, operation and maintenance (O&M), and system administrative costs.
    - Determine user types.
    - Research rate structures and regional and national user fees.
    - Provide planning-level user fees.
- Grant Administration
    - Continue grant administration of current grants and continue to seek out future funding sources.

C. POPULATION

The Village had a population of 774 at the time of the 2020 U.S. Census as shown in Table 1. While the population appears to be declining in Pellston, this does not trend with the population of Emmet County, which is projected to grow approximately 0.4% per year when comparing 2010 U.S. Census Data to 2020 U.S. Census Data.

Table 1: 2020 U.S. Census Population Data

Community	2010 US Census	2020 US Census	% Change
Village of Pellston	822	774	-5.8%

The Village's average household size is approximately 2.4 people according to the 2020 U.S. Census. According to the 2020 Census, of the 361 housing units within the Village of Pellston, 28 units were vacant, as presented in Table 2 below. These units may be seasonal housing units that are occupied at specific times. The Village's average household size of 2.4 people was used to estimate an additional 67 persons may be present during certain times of the year in seasonal units. This increases the Village's total population estimate to 858 persons at the time of the 2020 US Census.

Table 2: Village of Pellston Housing Data

Village of Pellston Housing Data	2020 US Census
Housing Units Occupied	333
Housing Units Vacant	28
Average Household Size	2.4

Existing (2025) population estimates were calculated utilizing the Emmet County 0.4% annual growth trend. The assumed seasonal housing population of 67 persons within the Village was held constant in the projections. This trend was also utilized for the 5-year (2030) and 20-year (2045) future population projection estimates. Table 3 below summarizes the existing and future population estimates.

Table 3: Population Projection Estimates

Community	2025 Population Estimate	5 Year Population Estimate (2030)	20 Year Population Estimate (2045)
Village of Pellston	858	875	927

According to the Overburdened Community definition formed by EGLE, the Village's service area meets the criteria of an Overburdened Community due to its median annual household income (MAHI) and taxable value per capita. This determination was made based on the following factors:

1. Their median annual household income being $59,464 which is less than the statewide median annual household income of $69,183.
2. Their taxable value per capita of $23,567 falling within the communities representing the lowest 20% of Michigan's population. For fiscal year (FY) 2026, the Michigan value is $25,269.

The application for determination of overburdened status was submitted on February 21, 2025, and can be found in Appendix A.

D. EXISTING ENVIRONMENT EVALUATION

1. CULTURAL AND HISTORIC RESOURCES

The Village of Pellston does not contain any historic landmarks according to the State and National Register. However, there are properties throughout the Village that are over 50 years old. If the project in Pellston is within the fundable range and the project is designated as equivalent, the State Historic Preservation Office (SHPO) requirements for DWSRF will be fulfilled.

2. AIR QUALITY

According to the 2023 Michigan Air Quality Report, the area is in compliance with National Ambient Air Quality Standards (NAAQS) for carbon monoxide, lead, nitrogen dioxide, ozone, particulate matter, and sulfur dioxide.

3. WETLANDS

Wetlands exist in portions of the Village. These are primarily found along the West Branch Maple River and near PLN Airport, shown in Figure 1 below. The State of Michigan regulates wetlands under Part 303 of the Natural Resources and Environmental Protection Act (Act 451 of 1994 or NREPA).

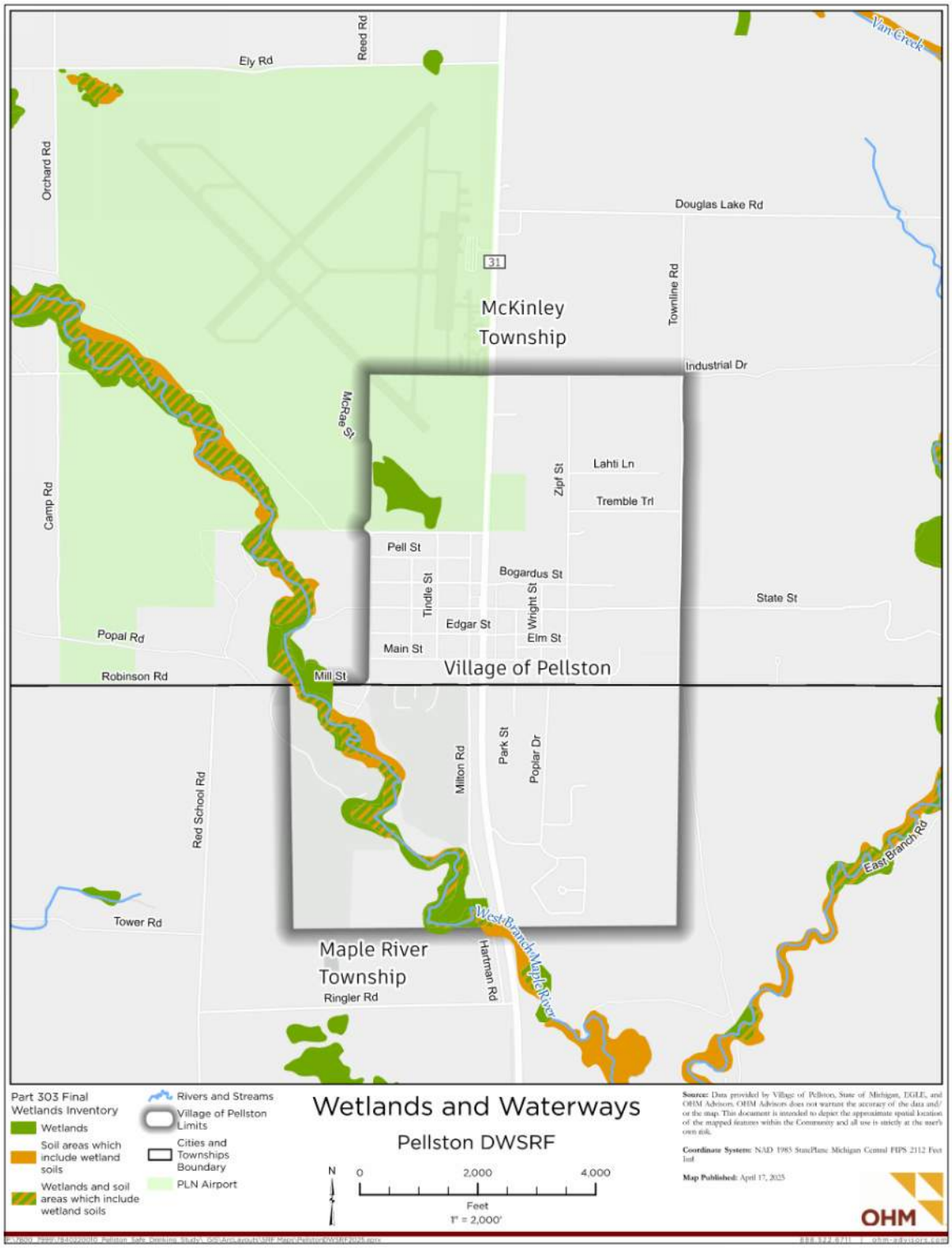

Figure 1: Wetlands and Waterways Near Village of Pellston

4. GREAT LAKES SHORELANDS, COASTAL ZONES, AND COASTAL MANAGEMENT AREAS

The Village is not located along the Great Lakes shoreline or coastal areas. There are no coastal zones within the project areas.

5. FLOODPLAINS

There are no areas in the Village of Pellston or project areas designated as within the 100-year floodplain.

6. NATURAL OR WILD AND SCENIC RIVERS

There are no Natural Rivers designated by the Michigan Department of Natural Resources (MDNR) or Wild and Scenic Rivers as designated by the National Wild and Scenic Rivers System in the Village.

7. MAJOR SURFACE WATERS

The West Branch Maple River is located within the study area and is part of the Cheboygan River Watershed. The West Branch Maple River is 16 miles long and eventually flows into Burt Lake at Maple Bay. There are no other major surface waters present in the Village.

8. TOPOGRAPHY

The terrain in the Village does not vary substantially. The highest elevations of approximately 722 feet above sea level are seen in the southeast portion of the Village. The lowest elevations of approximately 663 feet above sea level exist surrounding the West Branch Maple River. Figure 2 shows the topography of the Village along with the land surrounding it.

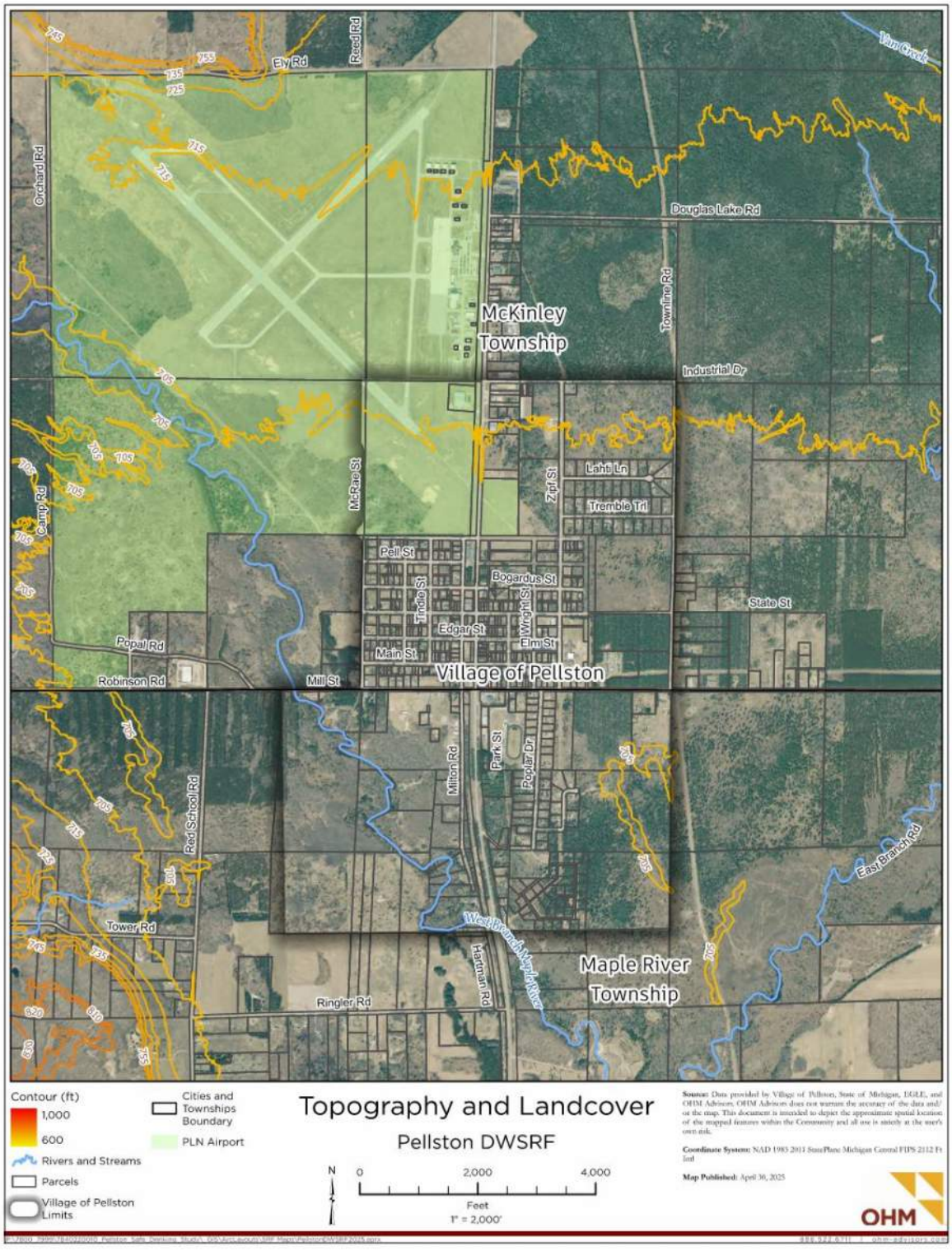

Figure 2: Topography Near Village of Pellston

9. GEOLOGY

The bedrock geology of Pellston includes Dundee Limestone and Detroit River Group of Devonian age. The quaternary geology is comprised of lacustrine sand and gravel and a small area is glacial outwash sand and gravel and postglacial alluvium.

10. SOIL TYPES

The soils found in the Village are mostly well drained to excessively drained soils. The soils include sand and loamy sand, shown in Figure 3.

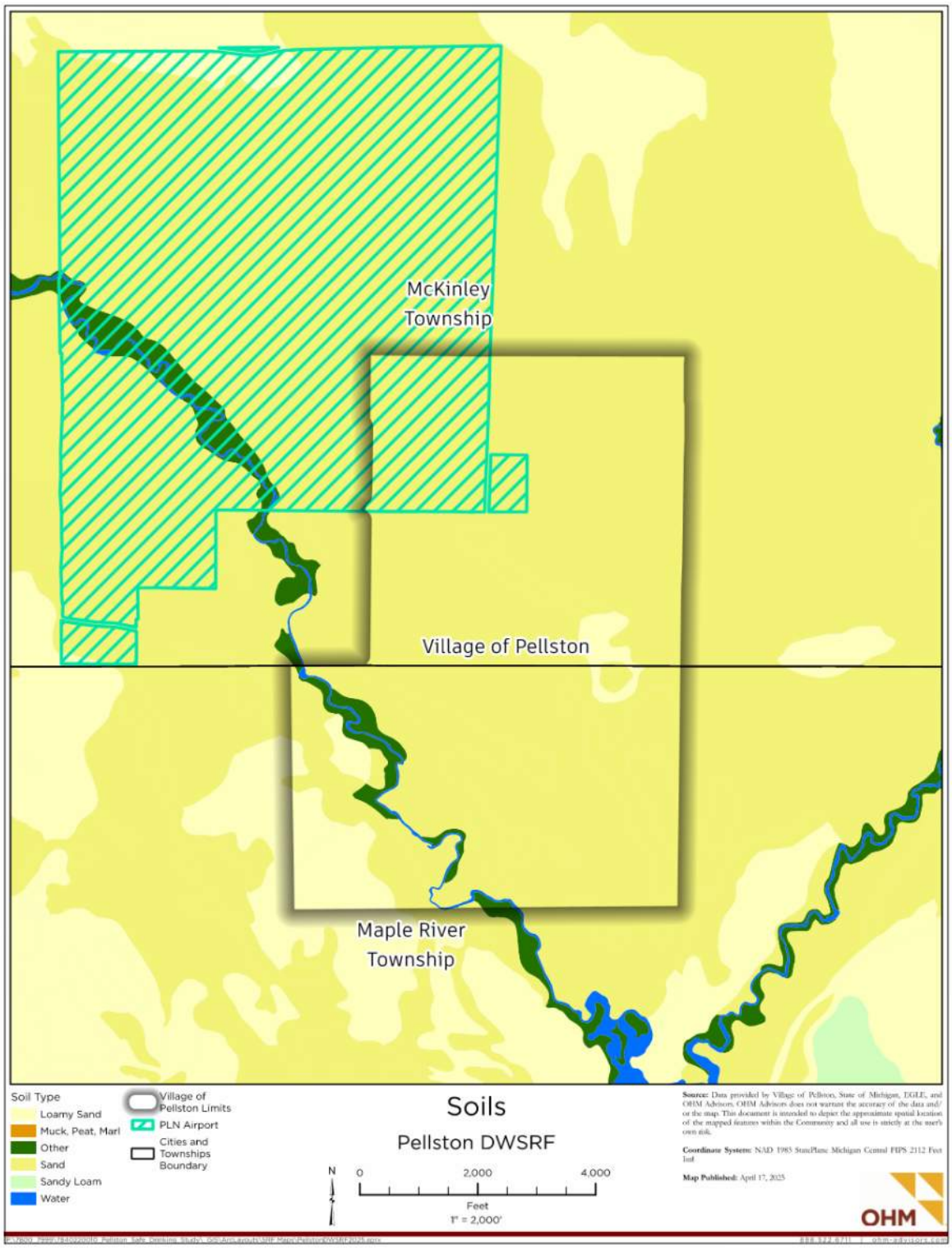

Figure 3: Soils Near Village of Pellston

11. AGRICULTURAL RESOURCES

According to the Northern Lakes Economic Alliance, about 15% of the land in Emmet County is agricultural. There is no land in Pellston zoned specifically as agricultural according to the Pellston zoning map adopted in 2021 shown in Figure 4 below. The three potential well sites are within the map limits.

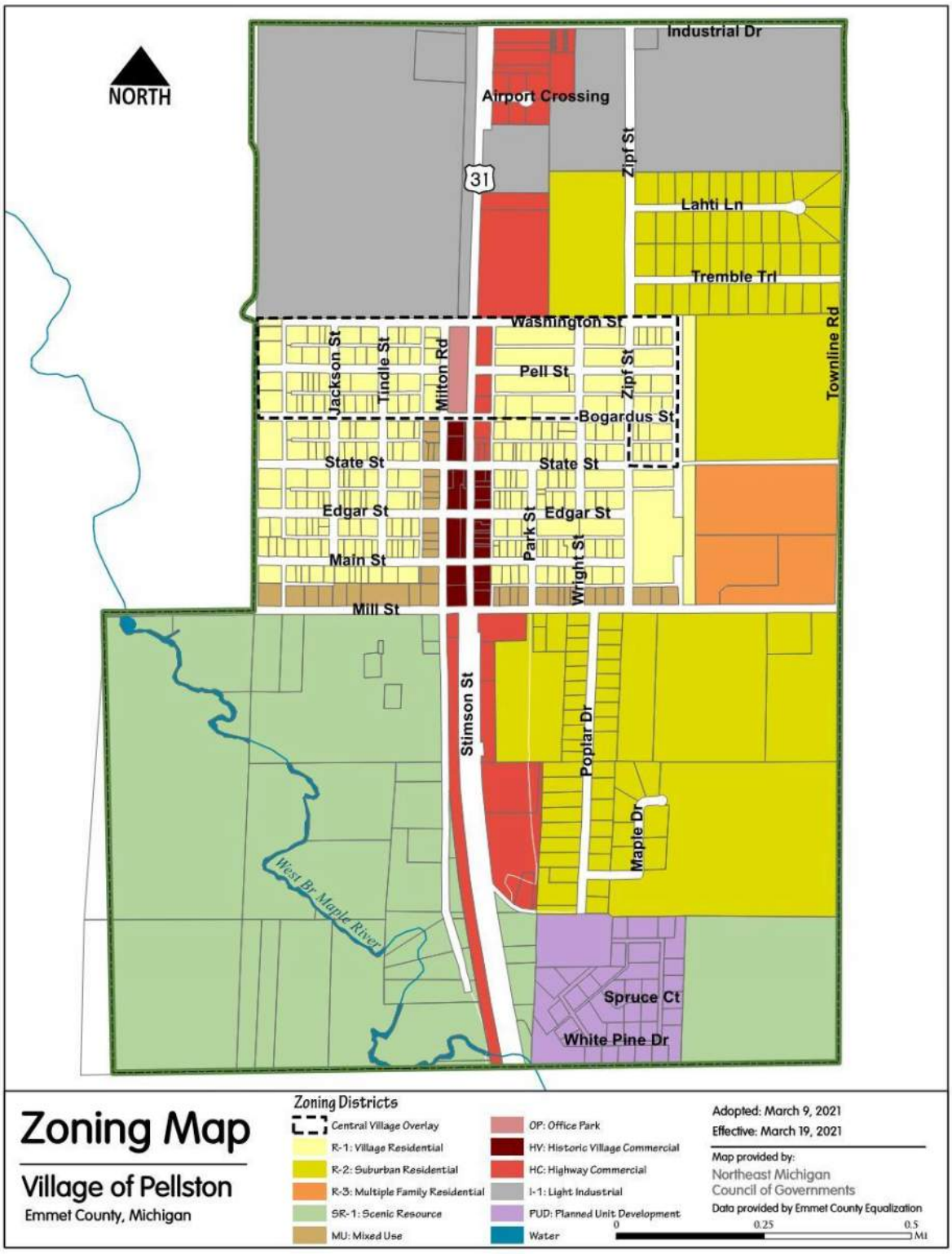

Figure 4: Village of Pellston Zoning Map

12. FAUNA AND FLORA

The Michigan Natural Features Inventory (MNFI) web database was reviewed for the presence of protected species. The full inventory can be found in Appendix B. The MNFI identified seven State threatened, endangered, or species of special concern documented within a 1.5-mile project area buffer which include the three potential well locations.

1. Douglass Stenelmis Riffle Beetle (*Stenelmis douglasensis*) – Species of Special Concern
2. Hungerford's Crawling Water Beetle (*Brychius hungerfordi*) – Endangered
3. Hairy Hedge-nettle (*Stachys Pilosa*) – Species of Special Concern
4. Little Brown Bat (*Myotis lucifugus*) – Threatened
5. Smooth Green Snake (*Opheodrys vernalis*) – Species of Special Concern
6. Woodland Vole (*Microtus pinetorum*) – Species of Special Concern
7. Yellow Banded Bumble Bee (*Bombus terricola*) – Species of Special Concern

The United States Fish and Wildlife Services (USFWS) Information for Planning and Consultation website identified a total of seven Federally threatened, endangered or candidate species near the project areas. The full report can be found in Appendix B.

1. Eastern Massasauga Rattlesnake (*Sistrurus catenatus*) – Threatened
2. Hungerford's Crawling Water Beetle (*Brychius hungerfordi*) – Endangered
3. Michigan Monkey-flower (*Mimulus michiganensis*) – Endangered
4. Monarch Butterfly (*Danaus plexippus*) – Proposed Threatened
5. Northern Long-eared Bat (*Myotis septentrionalis*) – Endangered
6. Pitcher's Thistle (*Cirsium pitcheri*) – Threatened
7. Rufa Red Knot (*Calidris canutus rufa*) – Threatened

Additional information on impacts to species and mitigation is provided in later sections of this report.

E. EXISTING SYSTEM

There is no existing public water supply system in the Village or any associated assets such as a WTP, distribution system, storage tanks, pump stations, service lines, or water meters. As a result, there are not any existing Village-wide systems in place for residuals handling, or operations and maintenance, and there is no design capacity or climate resiliency features to report.

F. NEED FOR PROJECT

PFAS has been identified in 124 wells (122 properties total) throughout the Village. These PFAS concentrations are believed to have derived from the AFFF used at PLN airport for training activities, which has contaminated the unconfined drinking water aquifer in the Village. Many wells contain PFAS at concentrations that exceed both EGLE and EPA drinking water standards. Sampling results indicate many wells exceed the EGLE MCLs for perfluorononanoic acid (PFNA), PFOA, PFOS, and PFHxS specifically. However, the number of homes with PFAS detections and MCL exceedances will likely continue to fluctuate due to potential for plume migration. The current Village treatment methods, POU filters, have not proven to be a long-term solution.

Permanent solutions including the following alternatives were and are being assessed as part of the WIIN grant feasibility study:

1. No action
2. Optimization of existing system
3. Point-of-entry (POE) filtration systems
4. Regionalization and formation of a public water system via a wholesale provider
5. Formation of a public water system via Village public well source

G. PROJECTED FUTURE NEEDS

If a public water system was implemented in the Village, the system would require ongoing operations and maintenance. A land use analysis was performed as part of the feasibility study to aid in existing and future demand estimation. If the population of the Village increased, the system could meet the needs of the in-fill development within the Village. Neighboring communities may become interested in connecting to the system in the future. More specifically, some portions of Maple River Township may choose to connect. The associated costs for expanding the distribution system to serve outside the Village limits, unless the properties bordered the Village and had positive PFAS detections, were not included in the cost estimates for the project.

III. ANALYSIS OF ALTERNATIVES

A. NO ACTION

If no additional actions were taken in Pellston, residents would continue using POU filter systems to treat the water from their private wells. Due to plume migration potential, more wells may become contaminated with PFAS and a greater number of POU filter systems would be required across the Village. There are concerns that residents are disconnecting and not replacing filters according to the MDHHS's guidelines. If residents were to use untreated contaminated water and be exposed to PFAS, there are many health effects that could result in consuming untreated contaminated water. These impacts include decreased fertility, increased high blood pressure in pregnant women, increased chance of thyroid disease, increased cholesterol levels, changing immune response, and increased risk of some cancers. If no actions were taken, PFAS would continue to be detected throughout the Village in private wells and residents would continue to risk exposure to PFAS.

As mentioned earlier, the Village does not have a sewer system and sewage treatment is completed through privately owned septic systems. When PFAS-contaminated water is disposed of through septic systems, these chemicals can leach into the surrounding soil and eventually make their way into the groundwater. This process can lead to the re-circulation of PFAS into the groundwater stream, posing a continuous risk to drinking water supplies and widespread contamination. The persistence of PFAS in the environment means that once they enter the groundwater, they can remain there for a long time, making it challenging to remediate contaminated sites.

Moreover, EGLE faces a significant burden in managing this situation, as they must oversee all the locations that currently utilize POU filters and continue with filter replacements and groundwater testing. Additionally, they must actively monitor the situation for potential contamination migration or as new residents/businesses request testing, which could increase the burden as more properties require POU filters. Through conversations had with EGLE through the feasibility study, it is understood that EGLE does not see POU filters as a long-term solution to the PFAS problem. For these reasons, No Action was not selected to be the selected alternative.

B. OPTIMUM PERFORMANCE OF EXISTING SYSTEM

As mentioned, the Village does not have an existing water system to be optimized. Residents use private wells that either have PFAS contamination or are at risk of contamination due to the characteristics of the aquifer. Some properties have elected to install POU filters as a temporary solution. Residences could receive more POU filters to have filters at more locations within their homes, but it would result in increased filter usage, maintenance, and regulatory costs. The installation of more filters would not protect Village residents from the risks associated with PFAS contamination as the current concerns of improper usage would persist. For these reasons, Optimum Performance of the Existing System was not chosen to be the selected alternative.

C. SINGLE HOME FILTRATION

Pellston residents have been given POU filters as a temporary solution, however, there are concerns about residents not replacing the filters or disconnecting them due to the low flow rate they provide. As a result, POE

systems were evaluated as an alternative solution for Village residents. POE systems are whole home filtration systems that treat all the water that enters a residence, with the ability to treat large amounts of water each day. For example, a POE system can produce 8 GPM of treated water compared to the 0.7 GPM presently being provided by the POU systems in place. All the water used throughout the house would be filtered, which reduces the risk of inhaling PFAS compounds volatilized during showering, provides clean water for garden irrigation, and can help preserve appliances, as well as plumbing. However, POE systems require frequent coordination with residents to give operators access to not only install the system but maintain it regularly. The systems also have specific site requirements, which include a heated indoor space with an adequate amount of room and level of accessibility. If there is not an existing area available to house the system, a new structure would have to be constructed to house the POE system.

In the evaluation of this alternative, it was assumed that POE systems would be installed in all locations where PFAS has been detected and that the systems would have a PFAS reduction rate of 97.9%. This alternative was evaluated when aiming to achieve acceptable concentrations according to both EGLE and EPA MCLs. Currently, a total of 122 properties would require a POE system, with the understanding that the number of homes requiring filtration will fluctuate due to plume migration and any future changes to MCL requirements. The primary difference between targeting the EGLE MCLs and the EPA MCLs is that when using the EGLE MCLs, all the systems installed would only require two filters (the minimum requirement of a lead filter and lag filter) to achieve acceptable concentrations. The compliance point is after the lead filter and the lag filter serves as a secondary insurance measure. However, if the EPA MCLs were used, six locations would need a system with three filters. After the first lead filter, these six locations would still have concentrations exceeding the EPA MCLs. As a result, they would need an additional lead filter for compliance, causing increased installation and operations and maintenance costs.

A large component of the single home filtration alternative is the operation and maintenance associated with POE systems. The systems would need to be routinely sampled by licensed operators and in-home surveys should be completed with sampling collection to ensure safe measures are being taken. The filters need to be changed out, which should be prompted by sampling results or the manufacturer's recommendations. Different approaches can be taken to sampling and filter change out frequencies; however, a concentration-based approach is the most cost-effective. Each location would be grouped based on existing concentrations and operations and maintenance schedules would be specific to that group. This would ensure that each location is being thoroughly monitored without wasting resources at locations with lower concentrations.

1. COST OPINION

Costs were estimated for the single home filtration alternative to install and maintain systems for all locations that have detected PFAS concentrations. The absolute number of households in Pellston that would need filtration units is in flux because plume delineation is ongoing and the PFAS regulatory framework is evolving. As mentioned, the EGLE and EPA MCLs have different requirements and costs were developed when referencing both agencies' MCLs. The estimated costs were based on two sources, the costs provided from a similar project in Grayling, Michigan and costs provided by McCardel Culligan Water of Traverse City (Culligan). The project in Grayling is in the pilot stages and a more accurate

estimate could be developed from this project with time. The costs from the Grayling example were scaled to the situation in the Village of Pellston. The costs provided by Culligan were estimated based on existing PFAS concentrations in Pellston and could change depending on fluctuating PFAS concentrations, water quality, and the number of homes requiring filtration systems. The anticipated annual costs for the installation and maintenance of POE systems in Pellston are purely an estimate. The installation costs for the Village can be found in Table 4 and Table 5 below.

Table 4: Installation Costs (EGLE MCLs)

Installation Costs				
Source	Item	Cost per Location	Locations	Total Cost
Grayling, MI (Conservative*)	Installation (2 filters)	$12,500	122	$1,525,000
Grayling, MI	Installation (2 filters)	$4,786	122	$583,925
Culligan	Installation (2 filters)	$8,300	122	$1,012,600

*Conservative estimate is based on costs associated with locations that required the construction of external heated enclosures

Table 5: Installation Costs (EPA MCLs)

Installation Costs				
Source	Item	Cost per Location	Locations	Total Cost
Grayling, MI (Conservative*)	Installation (2 filters)	$12,500	116	$1,536,448
	Installation (3 filters)	$14,408	6	
Grayling, MI	Installation (2 filters)	$4,786	116	$595,373
	Installation (3 filters)	$6,694	6	
Culligan	Installation (2 filters)	$8,300	116	$1,024,600
	Installation (3 filters)	$10,300	6	

*Conservative estimate is based on costs associated with locations that required the construction of external heated enclosures

The operations and maintenance costs were estimated using both the Grayling and Culligan costs. Two different monitoring approaches were explored, a quarterly monitoring approach and concentration-based monitoring approach. The operations and maintenance costs for the Village can be found in Table 6 and Table 7 below.

Table 6: Operation and Maintenance Costs (EGLE MCLs)

Operation and Maintenance Costs				
Approach	Sampling Events per Year	Cost per Location	Locations	Total Cost per Year
Quarterly Monitoring (Grayling, MI Costs)	4	$6,974	122	$850,932
Quarterly Monitoring (Culligan Costs)	4	$8,016	122	$977,953
Concentration-Based Monitoring (Grayling, MI Costs)	2	$2,757	97	$381,597
	4	$4,565	25	
Concentration-Based Monitoring (Culligan Costs)	2	$4,120	97	$570,630
	4	$6,841	25	

Table 7: Operation and Maintenance Costs (EPA MCLs)

Operation and Maintenance Costs				
Approach	Sampling Events per Year	Cost per Location	Locations	Total Cost per Year
Quarterly Monitoring (Grayling, MI Costs)	4	$6,975	116 (2 filters)	$856,597
		$7,919	6 (3 filters)	
Quarterly Monitoring (Culligan Costs)	4	$8,016	116 (2 filters)	$985,153
		$9,216	6 (3 filters)	
Concentration-Based Monitoring (Grayling, MI Costs)	2	$2,757	97 (2 filters)	$387,262
	4	$4,565	19 (2 filters)	
		$5,509	6 (3 filters)	
Concentration-Based Monitoring (Culligan Costs)	2	$4,120	97 (2 filters)	$577,830
	4	$6,841	19 (2 filters)	
		$8,041	6 (3 filters)	

Single household total year one costs were estimated to be between $8,689 and $19,996, depending on the approach and reference material used. The single household total year one and average ongoing yearly costs can be found in Table 8 below. The costs shown were based on the more conservative Grayling installation costs and both monitoring approaches were included.

Table 8: Single Household Installation and Ongoing Yearly Costs

Single Household Costs			
Installation	Monitoring Approach	Average Total Year 1 Cost	Average Ongoing Yearly Costs
Grayling, MI (Conservative)	Quarterly Monitoring Approach	$19,996	$7,496
	Concentration- Based Monitoring Approach	$16,403	$3,903

When using the EGLE MCLs as the target, the project would cost less than using the EPA MCLs. For future cost comparisons between alternatives, the EPA MCLs will be used as the target concentrations for compliance and the quarterly monitoring approach will be assumed for the systems. This combination would be the most rigorous approach for installation as well as operations and maintenance, keeping costs conservative. For cost referencing, the pricing provided by Culligan will be referenced. These costs are recent quotes from a local installer near Pellston that could potentially perform the work, rather than a reference from another project.

The number of homes with PFAS concentrations is subject to change and costs could be reduced if systems were only installed at locations with MCL exceedances. Costs may vary as the project develops and more accurate costs become available. EGLE does not consider POE systems a long-term solution for drinking water systems. Additionally, the list of homes that would require POE systems in Pellston will vary due to the fluctuating concentrations. POE systems would require ongoing maintenance and sampling to ensure the water is safe. It was determined that POE filters and associated costs would be an ineligible activity under DWSRF. For these reasons, this alternative was not selected.

D. PRINCIPAL ALTERNATIVE 1: REGIONALIZATION OF PROPOSED PUBLIC DISTRIBUTION SYSTEM WITH WHOLESALE SOURCE (HARBOR SPRINGS)

The Village does not have an existing water system; therefore, it is not currently feasible to connect to a regional water supply or consolidate a water supply that is not in place. As previously mentioned, a feasibility study has been completed for the Village, and through the study the alternative of connecting to a nearby water system and implementation of distribution main within the Village was explored.

A regionalization alternative was evaluated for the Village of Pellston, involving the Village purchasing water from a nearby supplier. The analysis ultimately focused on the City of Harbor Springs as a wholesale supplier. The City of Harbor Springs is located approximately 18 miles from the Village. A high-level analysis of the City of Harbor Springs public water system's capacity was completed.

1. COST OPINION

A high-level cost estimate to run water main from Harbor Springs to Pellston along US-131 was completed. The concept cost estimate for a 92,400-foot standard 24-inch water main is approximately $80 million. This cost does not include the construction of the Village's distribution system. No additional investigation

was completed for the booster stations or other facilities needed, as it was deemed unfeasible due to the distance to other systems and cost of the transmission main connection. For these reasons, the implementation of a distribution system and regionalization with connection to Harbor Springs was not chosen as the selected alternative. For comparison between alternatives, Table 9 shows the estimated capital costs of the transmission main and proposed distribution system, including a proposed elevated tank.

Table 9: Capital Cost Summary for Principal Alternative 1: Regionalization of Proposed Public Distribution System with Wholesale Source (Harbor Springs)

Asset	Capital Cost
Private Well Abandonment	$1,400,000
Transmission Main (Harbor Springs Connection)	$80,000,000
Distribution System	$22,300,000
Total	**$103,700,000**

2. OPERATION AND MAINTENANCE COSTS

In addition to the capital cost of the transmission main, the operation and maintenance (O&M) cost of water was estimated. Several assumptions were made to calculate the annual water purchase cost which estimates the annual cost of O&M. The following should be noted:

- Water rates are based on the City of Harbor Springs 2025 Water Rates for customers outside of the City of Harbor Springs. Source: https://www.cityofharborsprings.com/wp-content/uploads/2025/01/2025-City-of-HS-Utility-Rates.pdf
- The costs do not consider any debt or O&M costs associated with the new transmission main.
- The costs do not include additional purchase capacity fees.
- The costs do not include lawn irrigation meters.
- Water costs were estimated based on estimated Village of Pellston water demands, which are described in further detail in the Selected Alternative section of this report.
- Meter sizes were assumed for customer types through the feasibility study, which is further discussed in the Selected Alternative section of this report.

Table 10 shows the estimated water purchase costs.

Table 10: Estimated Water Purchase Costs from City of Harbor Springs

Category	Cost
Annual Fixed Cost	$627,000
Annal Usage Cost	$72,000
Total Annual Cost	$699,000

E. PRINICPAL ALTERNATIVE 2: PUBLIC WATER SYSTEM WITH WELL SOURCE

A public water supply would require less coordination with homeowners in the long-term and pose less risk of PFAS exposure when compared to the POU and POE alternatives. The Village would be classified as a Type I Community Public Water Supply based on the anticipated service area population discussed in the previous sections. A Type 1 Community Public Water Supply is defined by EGLE as a system that provides year-round service to not less than 25 residents OR not less than 15 living units.

The general requirements for a Type I Public Water Supply are listed below:

1. Obtain certified operators of treatment and distribution systems.
2. Monitor for contaminants at prescribed frequencies.
3. Submit waterworks system operation reports and maintain records.
4. Comply with the provisions of Part 41 of Rule 325 – Safe Drinking Water Act.
5. Submit plans and specifications and obtain permits from EGLE in accordance with the provisions of the Safe Drinking Water Act and Part 13 of Rule 325.

The installation of a public water distribution system with a public well source, WTP, and water storage were explored as an alternative in the feasibility study for the Village of Pellston. This alternative would give residents long-term reliable drinking water that is regularly monitored for compliance with EGLE standards. From an on-going operation and maintenance perspective, a public groundwater supply source is likely the most feasible option for the system. This alternative provides a long-term solution to resolving the public exposure to PFAS. Three potential well sites are under investigation and a final well site has not yet been selected. The water main layout to be installed is shown in Figure 5 through Figure 16.

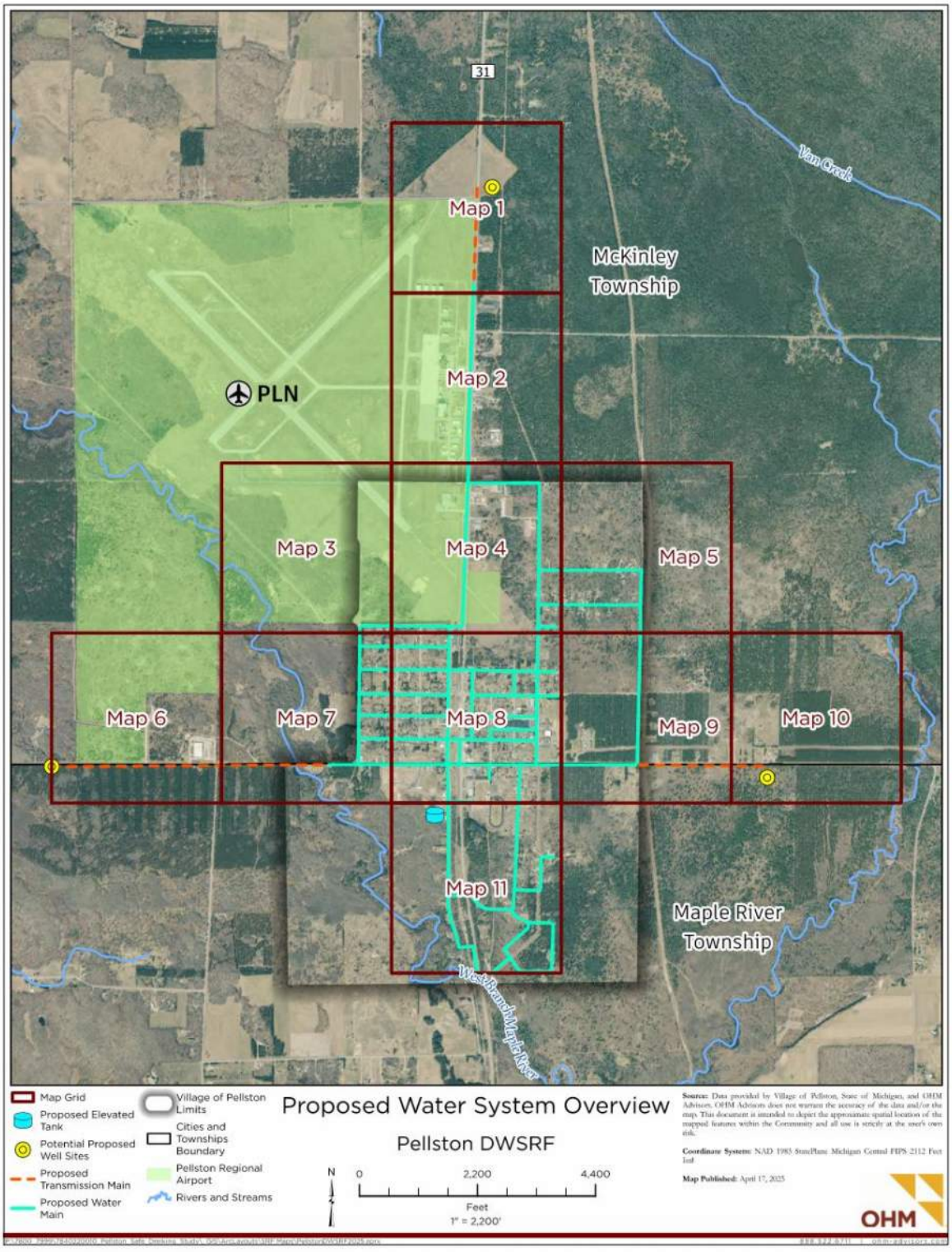

Figure 5: Proposed Public Water System Overview

Figure 6: Proposed Public Water System Map 1

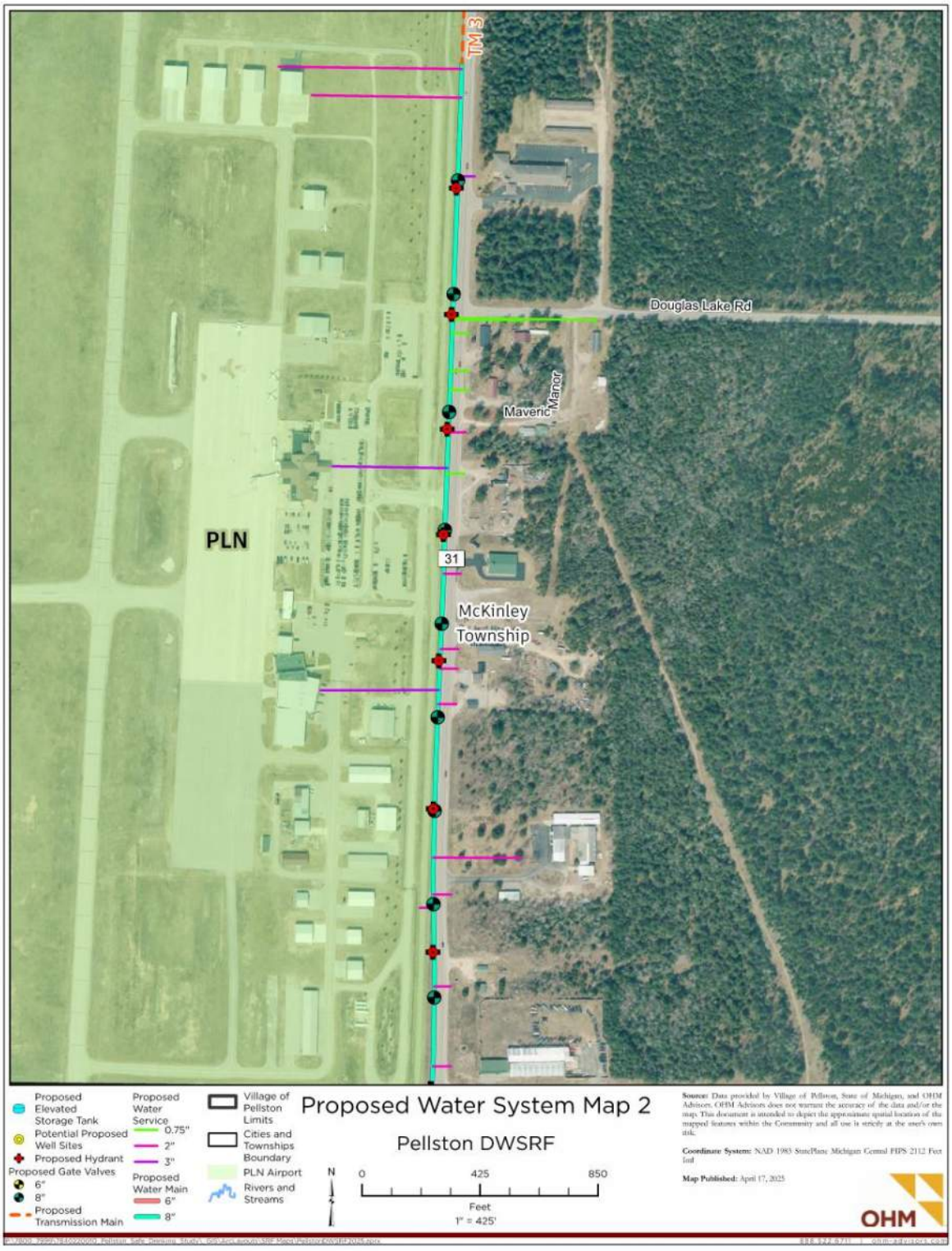

Figure 7: Proposed Public Water System Map 2

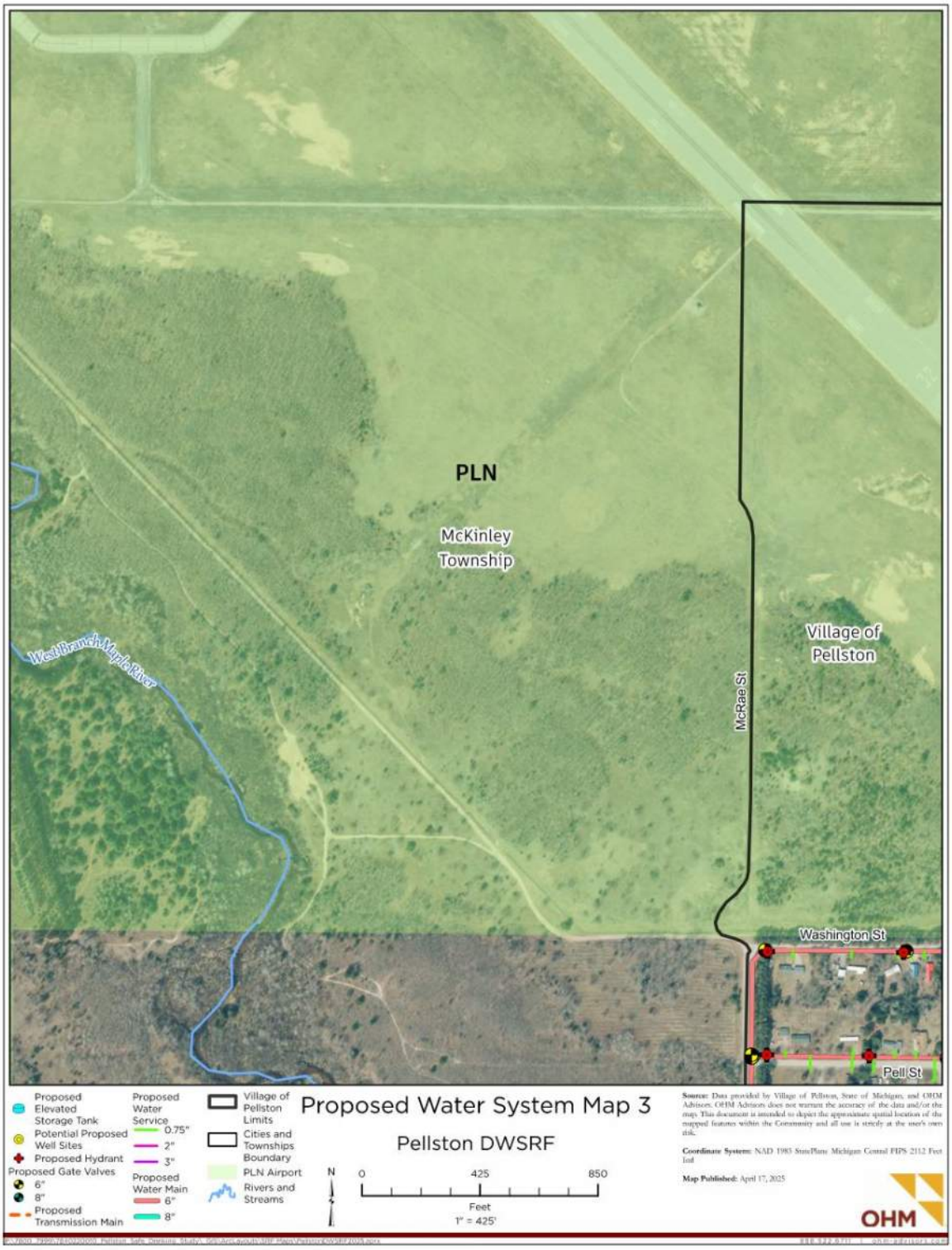

Figure 8: Proposed Public Water System Map 3

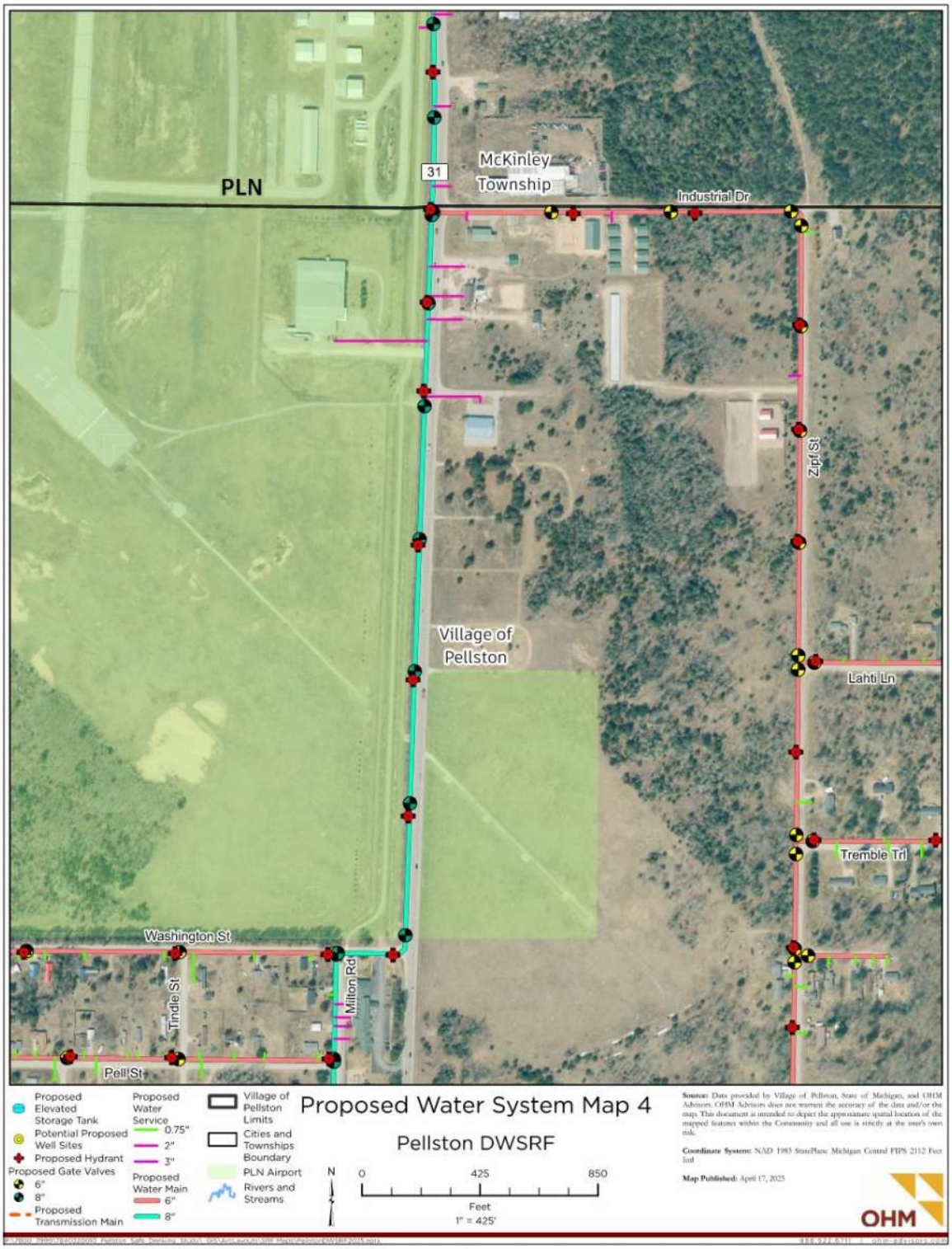

Figure 9: Proposed Public Water System Map 4

Figure 10: Proposed Public Water System Map 5

Figure 11: Proposed Public Water System Map 6

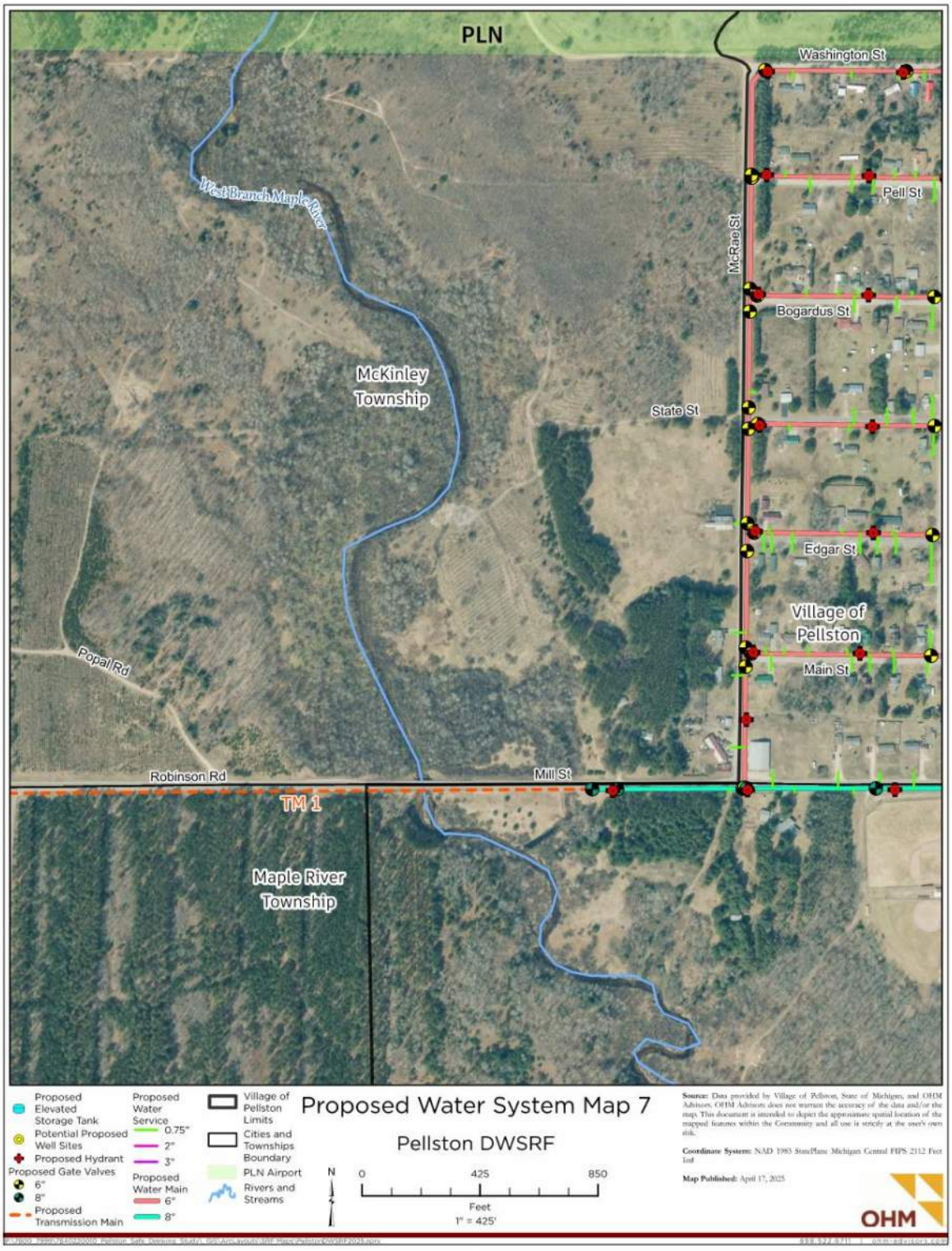

Figure 12: Proposed Public Water System Map 7

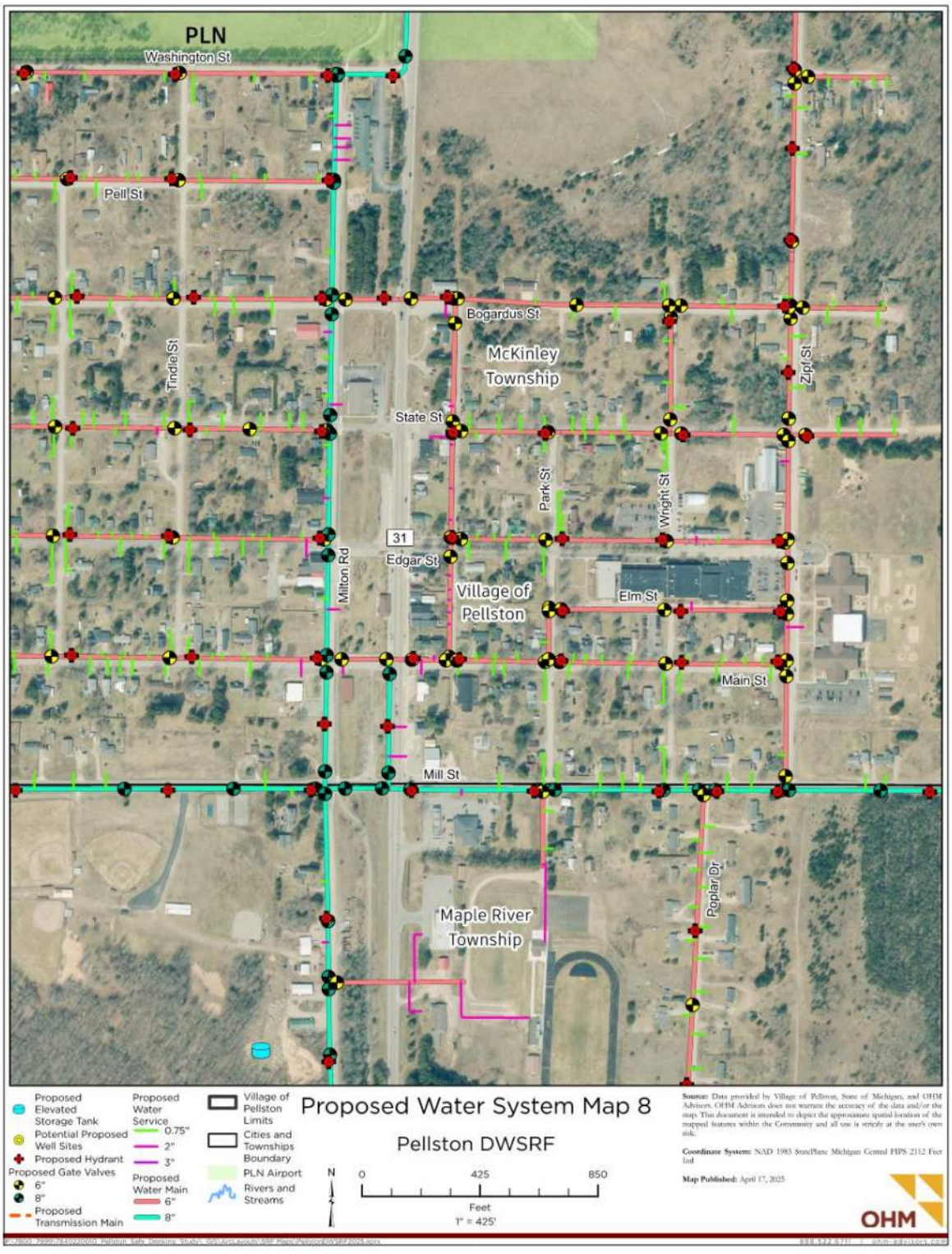

Figure 13: Proposed Public Water System Map 8

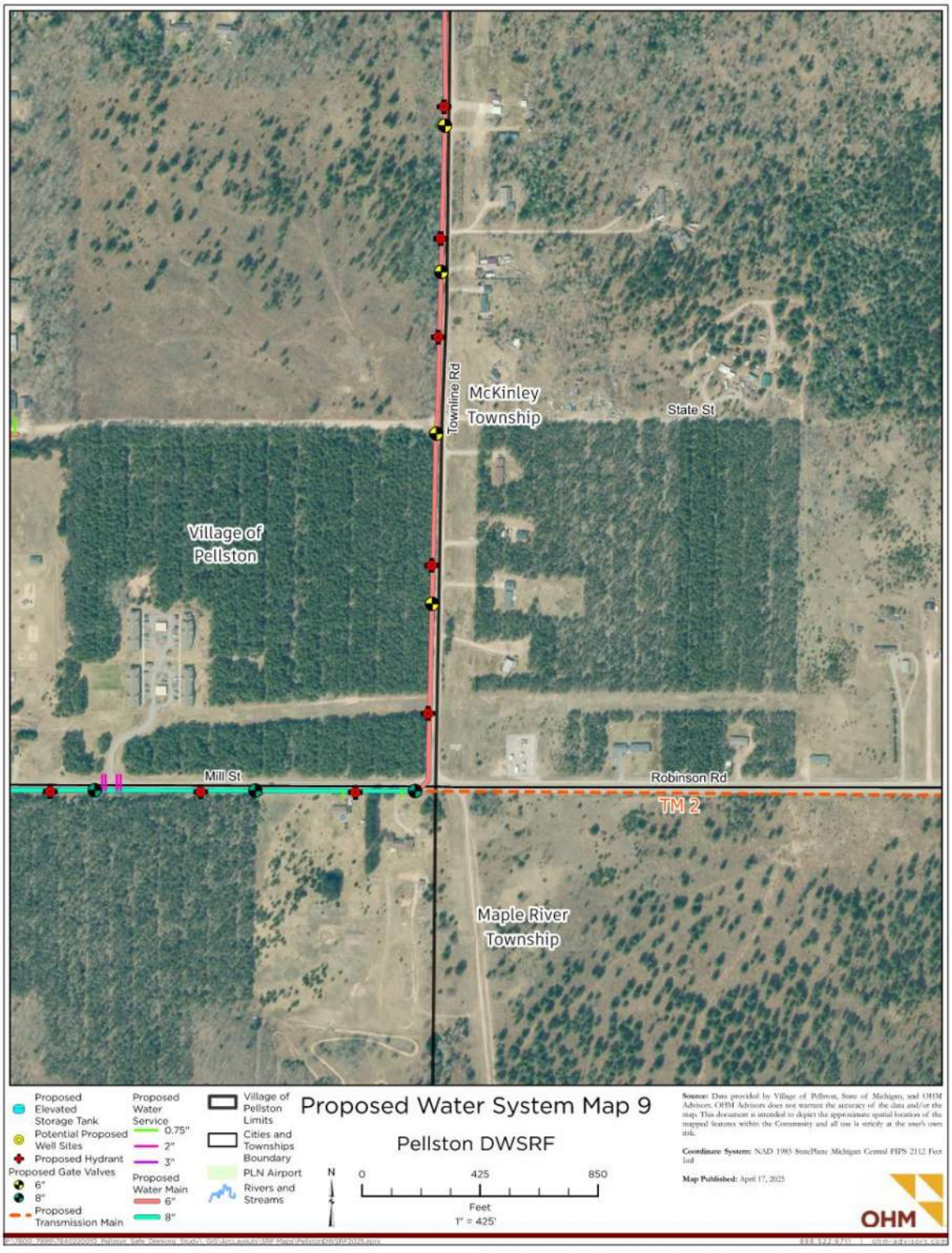

Figure 14: Proposed Public Water System Map 9

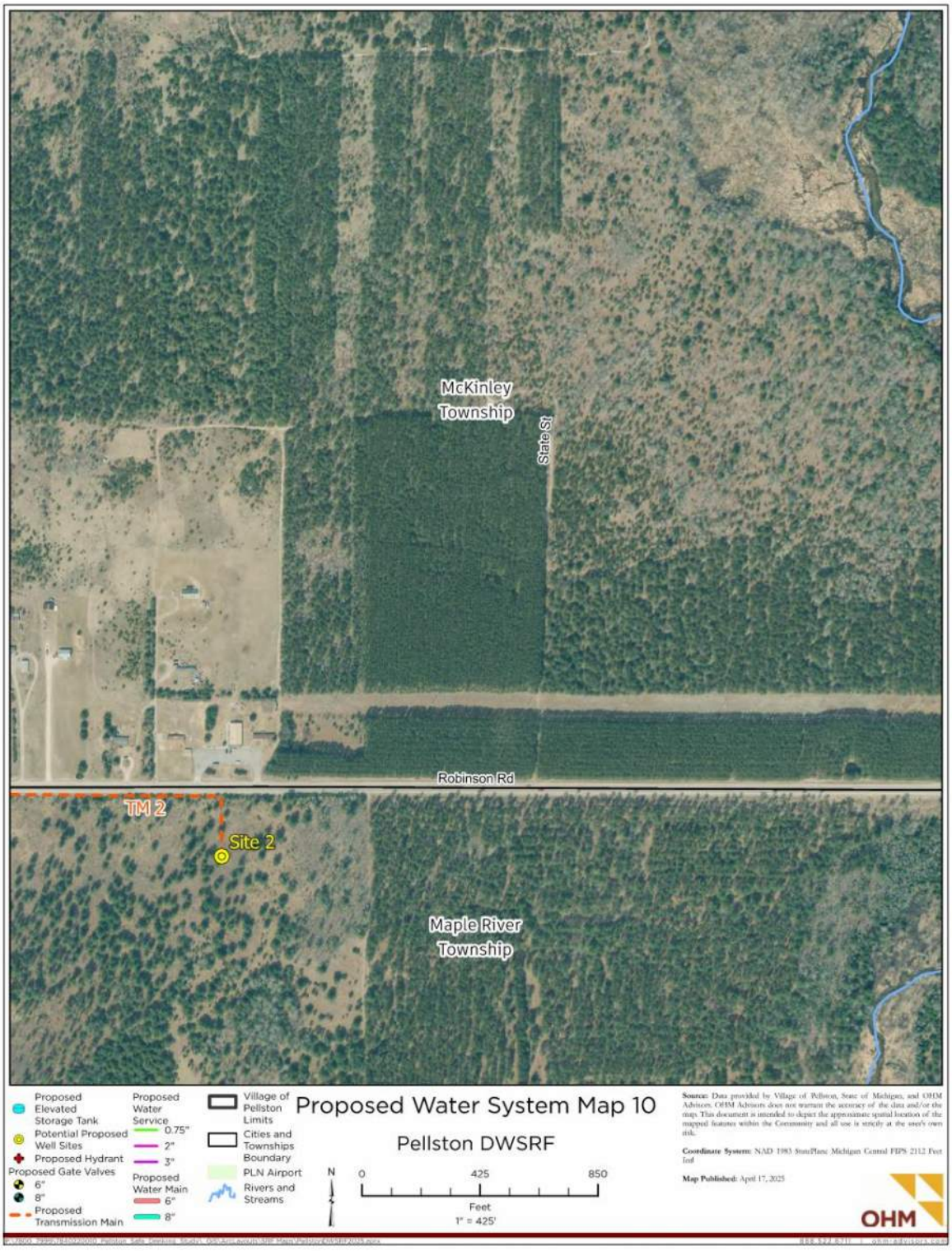

Figure 15: Proposed Public Water System Map 10

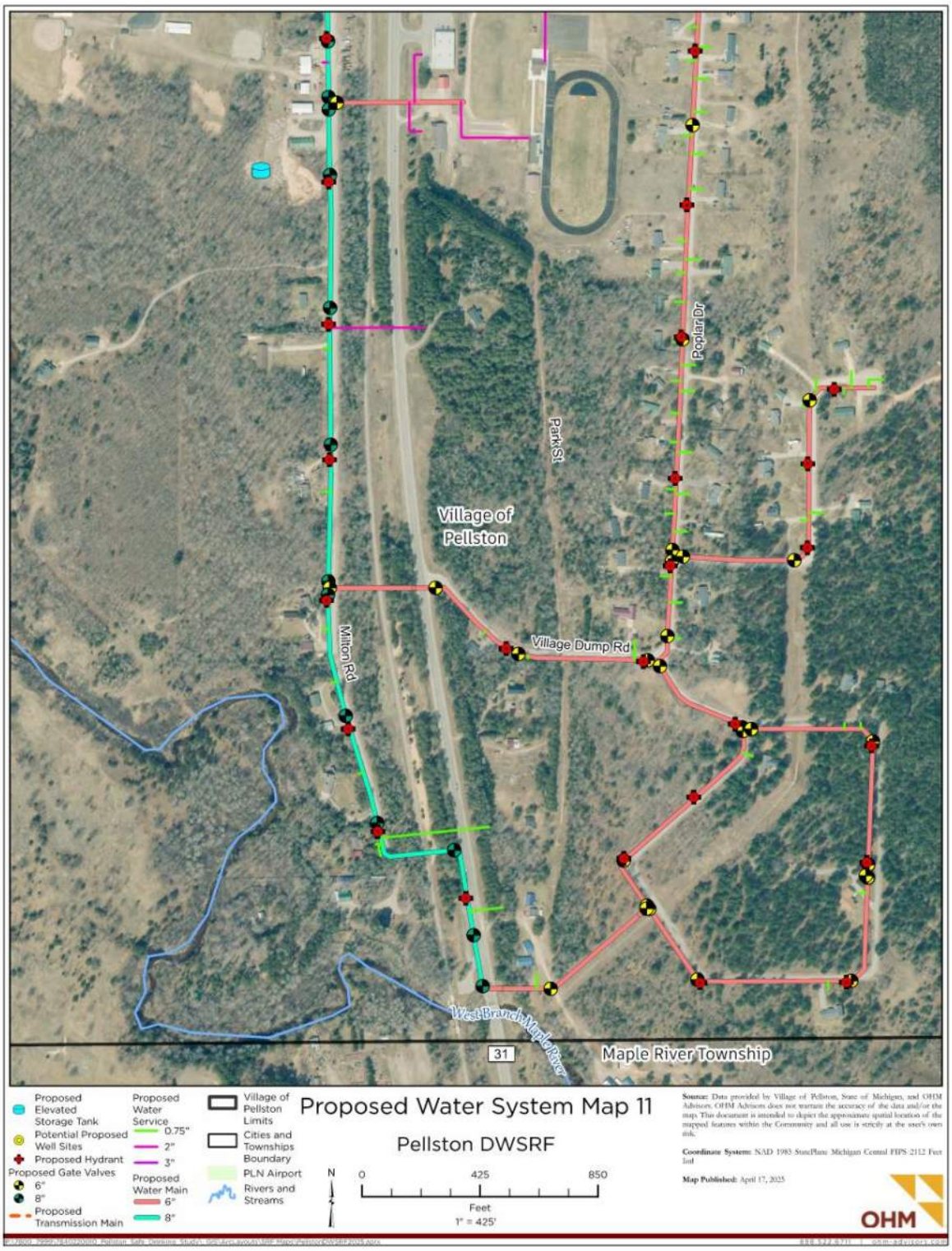

Figure 16: Proposed Public Water System Map 11

1. COST OPINION

Costs were estimated for the private well abandonment, proposed distribution system, well, WTP, transmission main, and elevated storage tank. For this Project Planning Document, the cost for the transmission main from the well to the distribution system was estimated based on the furthest potential well site as exploratory well site evaluation is ongoing. Capital costs associated with Principal Alternative 2 are shown in Table 11 below. Cost opinions include design, construction administration, and geotechnical costs.

Table 11: Capital Cost Summary for Principal Alternative 2: Public Water System with Village Well Source

Asset	Capital Cost
Private Well Abandonment	$1,400,000
Well, Treatment, and Elevated Storage	$17,300,000
Transmission Main	$3,000,000
Distribution System	$22,300,000
Total	**$44,000,000**

2. OPERATION AND MAINTENANCE COSTS

Annual O&M costs were estimated for this alternative. The annual estimated cost is $432,828. The O&M cost breakdown is available in Appendix C.

F. MONETARY EVALUATION

The opinions of probable cost were prepared for each alternative. The cost opinions are organized by asset and are provided in Appendix C. A summary of the present worth is presented in Table 12.

Table 12: 20 Year Present Worth Cost Comparison

Category	Principal Alternative 1: Regionalization of Proposed Public Distribution System with Wholesale Source (Harbor Springs)	Principal Alternative 2: Public Water System with Village Well Source
Capital Cost	$103,700,000	$44,000,000
Salvage Value	$31,920,000	$10,170,000
Present Worth of Salvage Value	$20,656,000	$6,581,000
O&M Cost	$699,000	$432,828
Present Worth of O&M Cost	$11,213,000	$6,943,000
Total Present Worth	$94,257,000	$6,943,000

G. ENVIRONMENTAL EVALUATION

The proposed projects offer alternatives to using POU systems and the water from the contaminated private wells in Pellston. An alternative approach is needed to ensure the residents' drinking water meets state and federal regulations and to protect public health. Table 13 depicts the environmental impact from each alternative.

Table 13: Environmental Impact

Category	Air	Wetland	Floodplain	Water/ Land Resources	Historical/ Tribal Resources	Endangered Flora and Fauna
No Action	None	None	None	None	None	None
Optimum Performance of Existing System	N/A	N/A	N/A	N/A	N/A	N/A
Single Home Filtration	N/A (Ineligible)	N/A (Ineligible)	N/A (Ineligible)	N/A (Ineligible)	N/A (Ineligible)	N/A (Ineligible)
Principal Alternative 1 (Regionalization)	Low/ Standard Construction	Low/ Standard Construction	None	Low/ Standard Construction	None	NLAA
Principal Alternative 2	Low/ Standard Construction	None	None	Low/ Standard Construction	None	NLAA

Note: NLAA – Not likely to adversely affect

Wetlands are present within the project limits for Principal Alternative 1, as the water main will cross the West Branch Maple River to reach the Village and there are several other areas containing wetlands along the route. The wetlands would be mitigated, and wetland seed mix would be used for restoration in these locations. Principal Alternative 2 would not impact any locations where wetlands are present.

There are not any areas in the Village or along Principal Alternative 1 transmission route to the Village that are within the 100-year floodplain, therefore, none of the alternatives would have floodplain disturbances.

There are several historical markers along the route from Harbor Springs to Pellston for Principal Alternative 1, but they are not located in areas that would be anticipated to be impacted by water main installation. Impacts to historic landmarks through Principal Alternative 2 are not anticipated, as they are not present in the Village.

In combination with the knowledge of the PFAS contamination in Pellston, there are also Part 201 and Part 213 sites in Pellston listed in EGLE's inventory. Part 201 sites contain environmental contamination and Part 213 sites contain leaking underground storage tanks.

Standard construction impacts to the environment and to the public is expected during construction of a public water system. The proposed construction will be performed in compliance with permit requirements.

H. PRESENCE OF CONTAMINATION

Principal Alternative 1 may intersect with the Part 201 and Part 213 locations along the transmission main route from Harbor Springs to Pellston. Part 201 sites contain environmental contamination and Part 213 sites contain leaking underground storage tanks. A summary of the addresses located along this route is provided in Table 14. The distribution system within the Village is included in Principal Alternative 1 may also intersect with Part 201 and Part 213 sites within the Village and near PLN, shown in Table 15 and Figure 17 through Figure 19.

Table 14: Part 201 and Part 213 Sites Located along Alternative 1 Transmission Main

Facility Name	Address	Part 201 or Part 213
Harbor Springs Area Sewage Disposal Authority - Station #8	2591 US-31	213
Oden State Fish Hatchery	3377 1/2 Oden	213
Wallace Car Care	31 North	213
Alanson Train Depot	7568 US-31	201
7566 South US-31	7566 South US-31	201

PFAS has been found in groundwater throughout the Village and can be attributed to the use of AFFF used during fire department training activities. According to EGLE's Inventory of Facilities accessible through the Remediation Information Data Exchange, there are also four Part 201 and Part 213 sites within the Village and/or near the Village limits and PLN. These contaminated areas may intersect with the proposed distribution system as a part of Principal Alternative 1 and Principal Alternative 2. These sites are provided in Table 15 below and can be seen in Figure 17, Figure 18, and Figure 19.

Table 15: Part 201 and Part 213 Sites Located within Proposed Distribution System Service Area (Alternative 1 and Alternative 2)

Facility Name	Address	Part 201 or Part 213
PLN	1395 US-31	201
Skis Party Store	1302 N US-31	213
68 Stimpson Street (US-31)	68 Stimpson Street (US-31)	201
Village of Pellston Dump (Closed)	US-31	201