CITY OF OBERLIN

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# Stormwater Strategic Plan

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Prepared For:

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## *ABBREVIATIONS*

| | |
|---|---|
| BMP | Best Management Practices |
| CAD | Computer-Aided Design |
| CCTV | Closed-Circuit Television |
| CMMS | Computerized Maintenance Management Systems |
| DBH | Diameter at Breast Height |
| DEM | Digital Elevation Model |
| EPA | Environmental Protection Agency |
| FEMA | Federal Emergency Management Agency |
| FIRM | Flood Insurance Rate Map |
| FIS | Flood Insurance Study |
| GIS | Geographic Information System |
| GLCAP | Great Lakes Community Action Partnership |
| IDDE | Illicit Discharge Detection and Elimination |
| KEM | K.E. McCartney & Associates, Inc. |
| LCSWMD | Lorain County Stormwater Management District |
| LTIP | Local Transportation Improvement Program |
| MACP | Manhole Assessment Certification Program |
| MCM | Minimum Control Measure |
| MS4 | Municipal Separate Storm Sewer System |
| NFIP | National Flood Insurance Program |
| NPDES | National Pollutant Discharge Elimination System |
| OGRIP | Ohio Geographically Referenced Information Program |
| OPWC | Ohio Public Works Commission |
| ORC | Ohio Revised Code |
| PACP | Pipe Assessment Certification Program |
| SCIP | State Capital Improvement Program |
| SOP | Standard Operating Procedures |
| SWMM | Stormwater Management Model |
| TMDL | Total Maximum Daily Load |
| USGS | United States Geological Survey |
| WPCLF | Water Pollution Control Loan Fund |
| WRLC | Western Reserve Land Conservancy |

# 1. Process

Stormwater and drainage have long been important issues for the City of Oberlin. Historically, the City has faced several challenges in addressing stormwater runoff, including historic and/or undersized infrastructure, heavy clay soils with poor infiltration, outdated approaches aimed at rapid stormwater removal, and limited funding. These issues are not unique to Oberlin, they are common across many communities in Ohio and throughout the United States.

## 1.1 Purpose/Goals

The passage of the Clean Water Act in 1972 marked a turning point in how stormwater is managed nationwide. In response, federal, state, and local governments were required to implement measures to improve the quality of stormwater runoff. One key outcome of this legislation is the Ohio EPA's Municipal Separate Storm Sewer System (MS4) General Permit, of which the City of Oberlin is a co-permittee under the Lorain County Stormwater Management District. This permit requires the City to address six (6) Minimum Control Measures (MCMs):

- Public Education and Outreach
- Public Participation/Involvement
- Illicit Discharge Detection and Elimination
- Construction Site Runoff Control
- Post-Construction Runoff Control
- Pollution Prevention/Good Housekeeping

These measures call for community engagement, storm system mapping, identification and elimination of non-stormwater discharges, erosion control at construction sites, and improved system maintenance and operations. Meeting these requirements to improve water quality, along with managing the quantity of water entering local bodies of water demands enhanced engineering, increased capital investment, more consistent inspections, and updated policies.

To meet these challenges, the City of Oberlin developed a Storm Water Utility based on engineering, financial and legal best practices. A major goal is the development of this Strategic Stormwater Plan, aimed at identifying system issues and setting a framework for addressing them.

Key objectives of the Strategic Stormwater Plan include:

- Identifying high-risk areas through the development of a stormwater infrastructure model
- Establishing priorities for future investigations
- Defining administrative priorities
- Reviewing and recommending updates to the Stormwater Business Plan and financial model

While the Strategic Plan focuses on areas within Oberlin's corporate boundaries, it acknowledges that stormwater does not recognize political borders. Therefore, it encourages collaboration with neighboring communities to share resources and achieve mutual benefits. The Overall Study Area can be found in Appendix A.

## 1.2 Background Research

A comprehensive review of all available background data was conducted and included a review of previous studies, integration of open-source Geographic Information System (GIS) information, existing conditions data from the City of Oberlin, construction plans and historical flooding data.

### 1.2.1 Flood Insurance Study

The Federal Emergency Management Agency (FEMA) conducted a Flood Insurance Study (FIS) for Lorain County and incorporated areas, effective August 19, 2008. A FIS is a compilation and presentation of flood risk data for specific watercourses, lakes, and coastal flood hazard areas within a community. When a flood study is completed for the National Flood Insurance Program (NFIP), the information and maps are assembled into a FIS. The FIS report contains detailed flood elevation data in flood profiles and data tables (FEMA.gov).

The information in the FIS contains portions of Plum Creek that lie within the City of Oberlin corporation limits. This data aided the development of the existing conditions model. It was also used to calibrate the model at critical locations within the City.

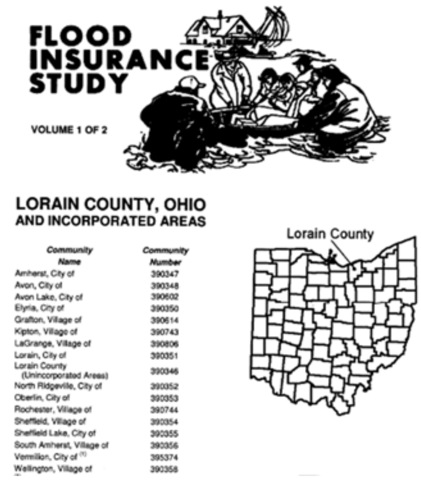



*Figure 1.1: FEMA FIS for Lorain County*

### 1.2.2 Open Source GIS Data

Using GIS as background data is essential for developing an accurate and effective stormwater model. GIS provides spatially referenced information such as land use, topography, soil types, and impervious surfaces, which are critical for delineating subcatchments, defining flow paths, and estimating runoff characteristics. By integrating layers like elevation contours, drainage systems, and parcel boundaries, modelers can create a detailed and realistic representation of the watershed. This geospatial data improves the precision of hydrologic and hydraulic simulations, ultimately leading to more reliable predictions of stormwater behavior and better-informed management decisions.

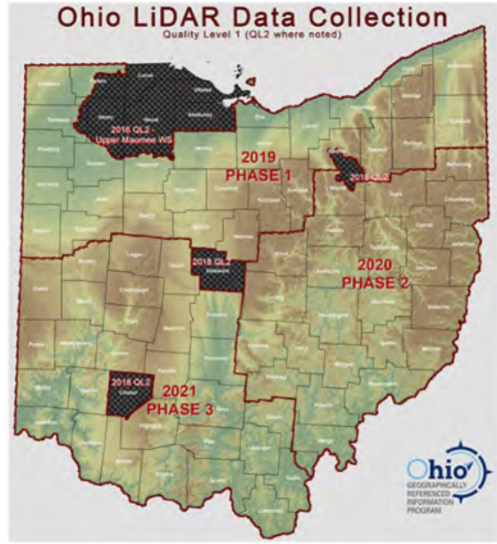


*Figure 1.2: OGRIP 3D Elevation Program*

3D elevation data established in 2019 was downloaded from the Ohio Geographically Referenced Information Program (OGRIP) website and was used as the base Digital Elevation Model (DEM).

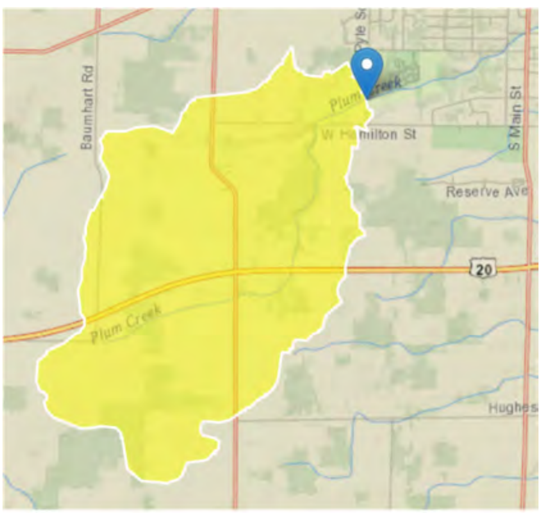


*Figure 1.3: StreamStats Watershed Delineation*

The United States Geological Survey (USGS) StreamStats program was used to delineate the watershed boundary for the study area. The combined DEM was used to create elevation contours, allowing the watershed to be split into separate subcatchments for use in Stormwater Management Model (SWMM) software. StreamStats was also used to determine upstream boundary conditions for the SWMM software. Gathering information on the upstream drainage area allowed the model to be effectively calibrated. Aerial imagery, parcel information, road centerlines, water bodies, and building footprints were downloaded from Lorain County's GIS data system.

Floodplain data was also researched using FEMA's Flood Map Service Center. The study area consists of two Flood Insurance Rate Map (FIRM) panels with map numbers 39093C0211D (eff. 8/19/2008) and 39093C0212D (eff. 8/19/2008).

### 1.2.3 City of Oberlin Data

The City of Oberlin provided data for their public storm sewer system in GIS and Computer-Aided Design (CAD) format. This data, called the Storm Atlas, contains information on drainage structures, storm sewer, culverts, and outfalls. The Storm Atlas included some private storm sewer system infrastructure, but most private systems were absent. Though there was missing data in the Storm Atlas, it provided a good foundation when creating the existing conditions model. GIS data collected in the field was used to fill in some of the data gaps.

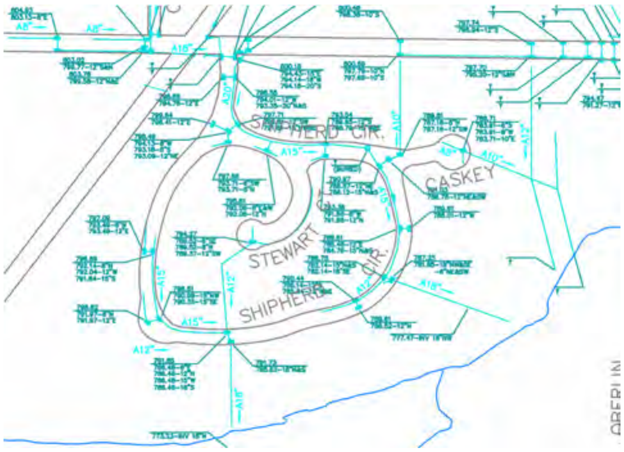



*Figure 1.4: City of Oberlin Storm Atlas*

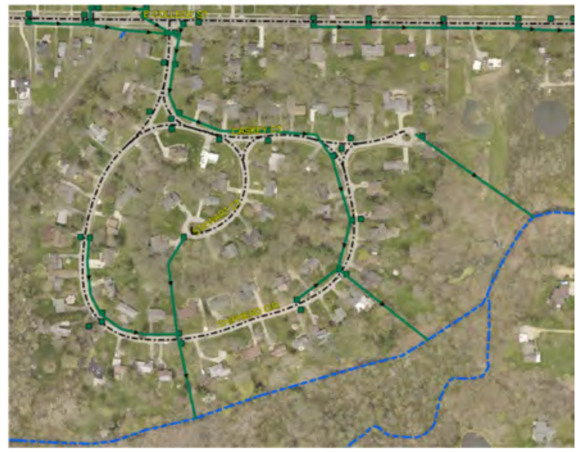


*Figure 1.5: City of Oberlin GIS Data*

### 1.2.4 Construction Plans

Construction plans and as-built drawings were gathered to help fill in missing data gaps. The City of Oberlin provided plans/drawings for projects that were completed in the City. These plans/drawings included projects for drainage improvements, bridge improvements/replacements, site developments, road improvements, and roadside improvements. Lorain County provided construction plans for improvement projects that occurred outside of Oberlin's corporation limits. The plans and drawings that were available provided location, elevation and dimensional information for drainage structures and pipes/culverts and helped with the creation of the existing conditions drainage model.

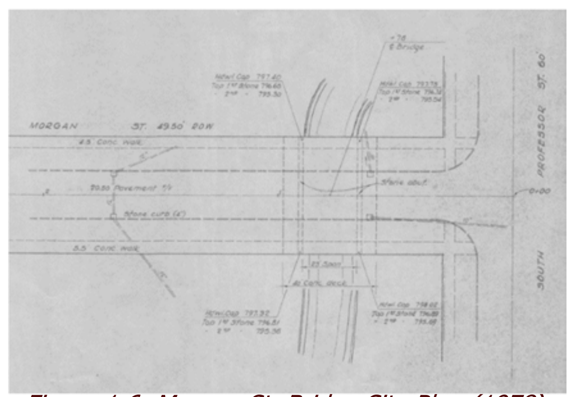



*Figure 1.6: Morgan St. Bridge Site Plan (1978)*

### 1.2.5 Surveying

KEM surveyed critical drainage features that were either missing or incomplete from the data sets provided by the City or which did not provide enough detail from the other background data sources. The surveyed data included storm sewer structure data, culverts, outfall locations, flowlines and cross sections of ditches. The compiled survey data was merged with the OGRIP elevation data to create a combined DEM for the entire study area for use in conceptual design and modeling software.

### 1.2.6 Historical Problem Areas

The City of Oberlin has faced challenges from heavy precipitation and rapid snowmelt events, leading to flooding in low-lying areas and areas with inadequate drainage systems. While the City's sanitary and storm sewer systems are separated, severe weather conditions can lead to significant stormwater inflow and infiltration into the sanitary sewer system. These events have strained the City's existing stormwater infrastructure, prompting concerns about pollutant runoff into local waterways like Plum Creek.

In February of 2011, the City of Oberlin experienced widespread flooding due to heavy rain, thunderstorms, and rapid snowmelt occurring at the same time. Residents documented the resulting flooding by filling out flood reports and taking pictures. City employees also recorded key flooding areas and took pictures of crucial city infrastructure.

*Figure 1.7: S. Professor St. Flooding (2011 Event)*

*Figure 1.8: W. Vine St. Flooding (2011 Event)*

## 1.3 Development of Existing Conditions Model

The existing conditions stormwater management model was initially developed in 2022 using the Ohio Environmental Protection Agency (EPA) SWMM Version 5.1.015. This 1D model included the drainage components found within the City of Oberlin and some that are tied to the City's system that lie outside of the corporation limits. The extent of the existing conditions model can be seen in Appendix B.

*Figure 1.9: Existing 1D Model*

There are three subwatersheds that receive stormwater runoff within the City of Oberlin. The Plum Creek subwatershed within the study area contains over 5,102 acres. The subwatershed for Herrick Ditch within the study area is over 399 acres. The Gott Ditch subwatershed includes over 72 acres within the study area. Stormwater runoff is captured and routed to each of the streams by separate storm sewer drainage systems, called a sewershed. In all, 14 separate sewersheds were modeled, which can be seen in Appendix C. The sewersheds, listed below, and are arranged geographically (generally west to east):

1. Colony-Morgan
2. S. Prospect
3. Lincoln
4. W. Vine
5. E. Vine-S. Pleasant
6. N. Park-S. Park
7. S. Park-Groveland
8. King-Shipherd
9. N. Professor
10. Maple
11. Artino
12. N. Oberlin-E. Lorain
13. Reserve
14. S. Main

Each of these sewersheds were modeled using gathered data from various sources as outlined in Section 1.2 Background Research. GIS data was used as initial background data to create the existing model components. Combined GIS/survey elevation data was utilized by the SWMM software for various uses including ditch cross sections (transects), subcatchment slope calculations and junction invert/rim elevations. Survey data was collected at critical locations and where data was missing. This data was used to create a 1D drainage system, which included drainage inlets, culverts, ditch flow line elevations and outfalls.

## 1.4 Model Calibration

Once the existing model was complete, it was run using the 1-, 2-, 5-, 10-, 50- and 100-year design storms. The results were compared with known flood elevations and other studies. The model was then calibrated and re-run multiple times to assimilate these flood elevations and rates. Then the results were analyzed and reviewed with City of Oberlin Public Works staff.

Critical infrastructure and model components were also investigated by conducting further research and field verification. Survey needs were documented, and crews were sent out to examine existing field conditions and collect necessary additional data. The model was modified to reflect any new-found circumstances.

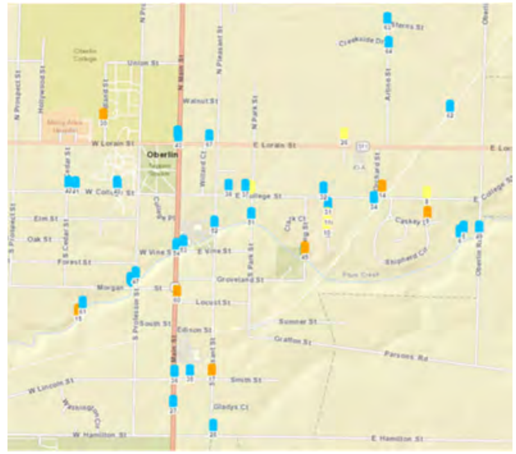


*Figure 1.10: Additional Survey Map*

## 1.5 Development of 2D Model

Once the 1D model was finalized, the end results were shared with city staff. After further discussions, it was determined that the 1D model alone would not convey the results necessary for use in public outreach. With this in mind, a 2D component for the model was planned that could render the results in a way that would facilitate public outreach. To achieve this, elevation data was added to the model to create a 2D flood depiction. GIS elevation data was used as the background to create a DEM. This, combined with surveyed elevations, was added to the model and used for various purposes including calculating overland flow.

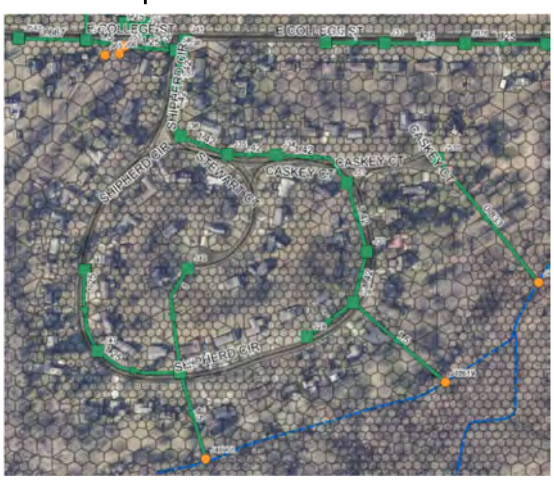


*Figure 1.11: Existing 2D Model*

After further analysis and calibration, the results were used to create 2-dimensional flood rasters. These raster images use a grid of cells (pixels) to represent the extent of overland flooding. Maps were then created using these flood rasters to demonstrate likely impacts during 1-year, 2-year, 5-year, 10-year, 50-year and 100-year storm events in each sewershed. The maps were used to assess flood potential and to assist in public outreach. Flood raster maps showing the anticipated flooding extent for each storm event are provided in Appendix D.

### 1.6 Public Outreach

For eight weeks, the City of Oberlin posted the flood raster maps for each of the 14 sewersheds in an exhibit at the Oberlin Enrichment & Activities Center. City staff announced the exhibit through the City's newsletter and its social media channels. Staff also performed a presentation of these maps to a crowd of interested residents/property owners.

After the exhibit ended, Public Works staff coordinated additional stakeholder outreach by meeting with the Public Utilities Commission, Oberlin College facilities staff and with the City's General Maintenance Division personnel who are charged with the operation and maintenance of the storm sewer system. These meetings were held to review the flood raster maps, seek additional input, and field additional comments.

The City also met with a long-time local plumbing/excavation contractor, whose knowledge and first-hand experience surpasses most. During the meeting, the flood inundation maps were explained, and the contractor's feedback was collected.

A recording of the stormwater master plan presentation and associated flood raster maps of each sewershed is posted to the City's website for public access. Here the concept of stormwater is explained, and the flood raster map components are described. Each sewershed flood raster map is available for download on this page as well as a public feedback form that can be used by residents and property owners to report issues associated with stormwater. You can access the City's Stormwater Master Plan website by using this link (https://cityofoberlin.com/city-government/departments/public-works/stormwater-management/stormwater-master-plan/).

## 2. Priority Locations

Priority locations within the City have been identified as areas with stormwater issues that need to be addressed. The Oberlin Climate Hazard Fact Sheet, included in the City's 2021 Climate Vulnerability Assessment Report, reinforces the need to address priority locations. Predictive changes in seasonal precipitation and the increased frequency of heavy precipitation (>1-inch of rainfall) are expected to exacerbate drainage issues in areas already subject to flooding conditions.

Priority locations were validated through the existing conditions model, review with key Oberlin staff members, historical flood information, and public involvement. There are 16 priority areas within 14 sewersheds. The priority areas are discussed in more detail in each subsequent sewershed section. Each priority area requires further study to determine the best solution, which may involve grey or green infrastructure, or a combination of both. Numerous factors impact when and how each priority location will be studied and addressed, including severity, cost, grant opportunities, land acquisition requirements, ability to phase projects, and timing with other capital projects such as street, sanitary sewer, or water main improvements. Detailed descriptions of each priority area are provided in this section, and the locations of each are readily viewed in Appendix D - Flood Raster Maps.

## 2.1 Colony-Morgan Sewershed

The Colony-Morgan sewershed contains a storm sewer system that collects runoff from Cypress St. to W. Lorain St. The main trunk sewer runs southerly between Glenhurst Dr. and Hawthorne Dr./Colony Dr., crosses Morgan St. and eventually outfalls to an unnamed ditch along the western edge of Westwood Cemetery, draining to Plum Creek. A bypass storm sewer runs along Morgan St., which intercepts flow at Pyle South Amherst Rd. and routes it directly to the trunk sewer. The Colony-Morgan Sewershed Map can be found below and on Sheet 1 of Appendix C.

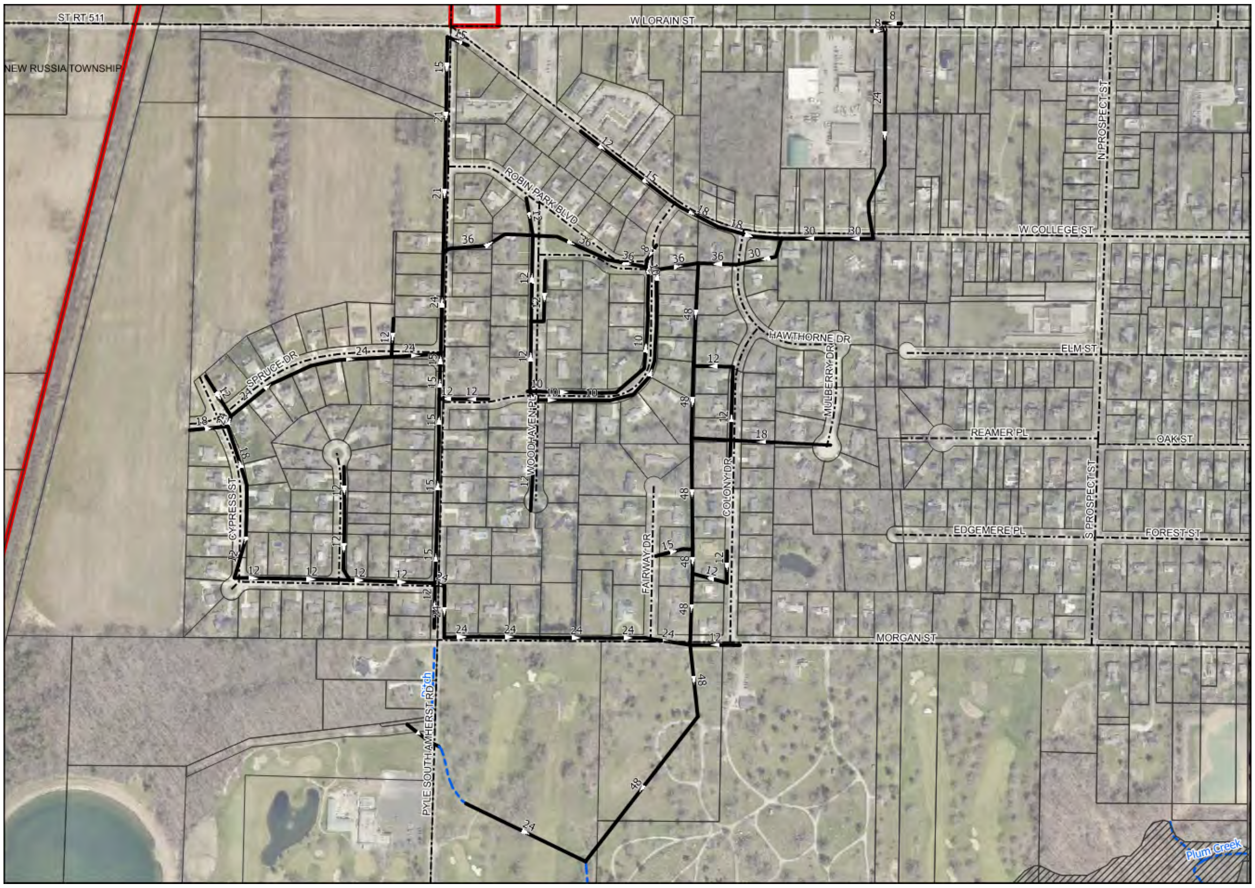



*Figure 2.1: Colony-Morgan Sewershed*

After running the stormwater model for the 100-year design storm, flooding potential was calculated in the area near the intersection of Robin Park Blvd. and Glenhurst Drive, east towards Hawthorne Drive and further south along Colony Drive. There is a history of yard flooding complaints in this area. Another flood-prone area is shown within the Oberlin Golf Club and Oberlin College properties along the 24-inch storm sewer draining east-southeast into the main trunk storm sewer. Flood raster maps for this sewershed can be found below and on Sheet 1 of Appendix D.

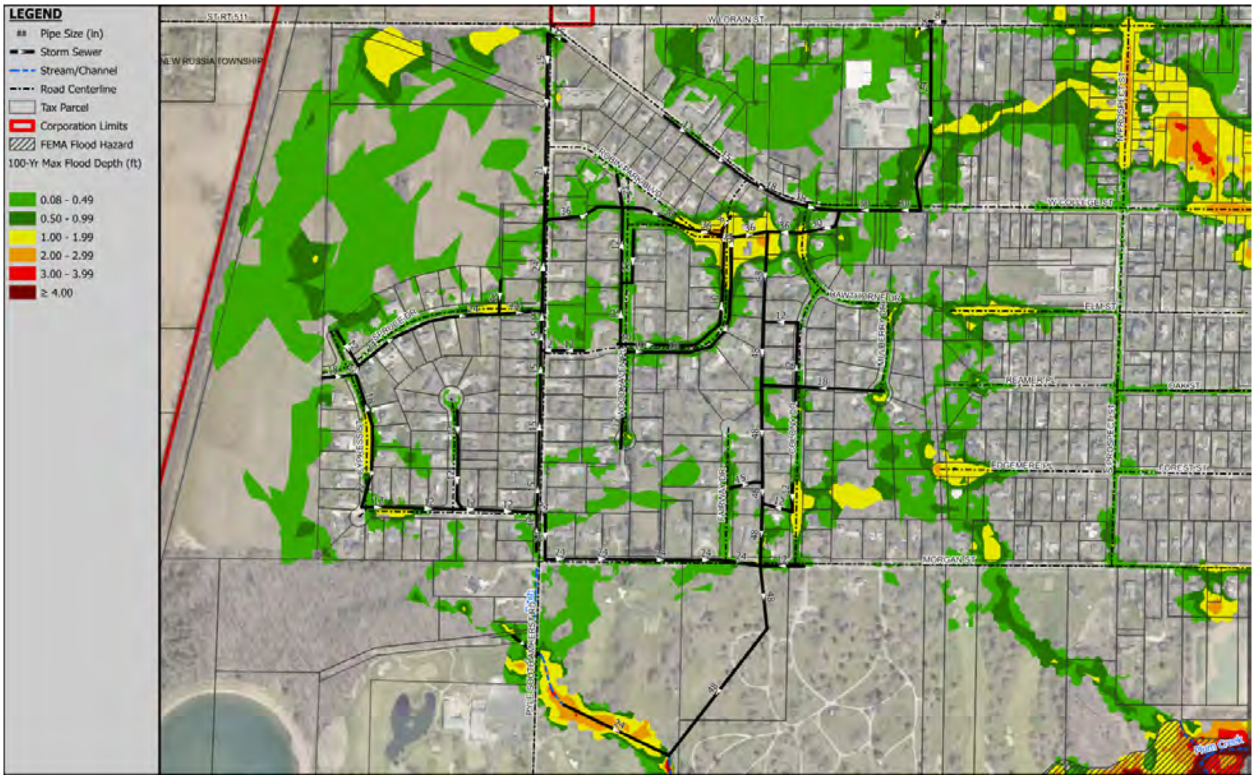



*Figure 2.2: Colony-Morgan 100-Year Flood Raster*

## 2.2 South Prospect Sewershed

This sewershed contains three outfalls. The western system collects stormwater from drainage structures originating on Hawthorne Dr. and Mulberry Dr. The main trunk line travels south along the westerly cul-de-sacs of Elm St., Reamer Pl., and Edgemeer Pl. to Morgan St. This western branch travels through the Oberlin Golf Club and Oberlin College properties and intersects with a branch collecting runoff from S. Prospect St. It continues through privately owned property, with the outlet at an unnamed tributary ditch of Plum Creek. Another central storm sewer line outlets into this ditch from Morgan St. The eastern branch of this storm sewer system outlets to Plum Creek, draining from S. Cedar St. The S. Prospect Sewershed Map can be found below and on Sheet 2 of Appendix C.

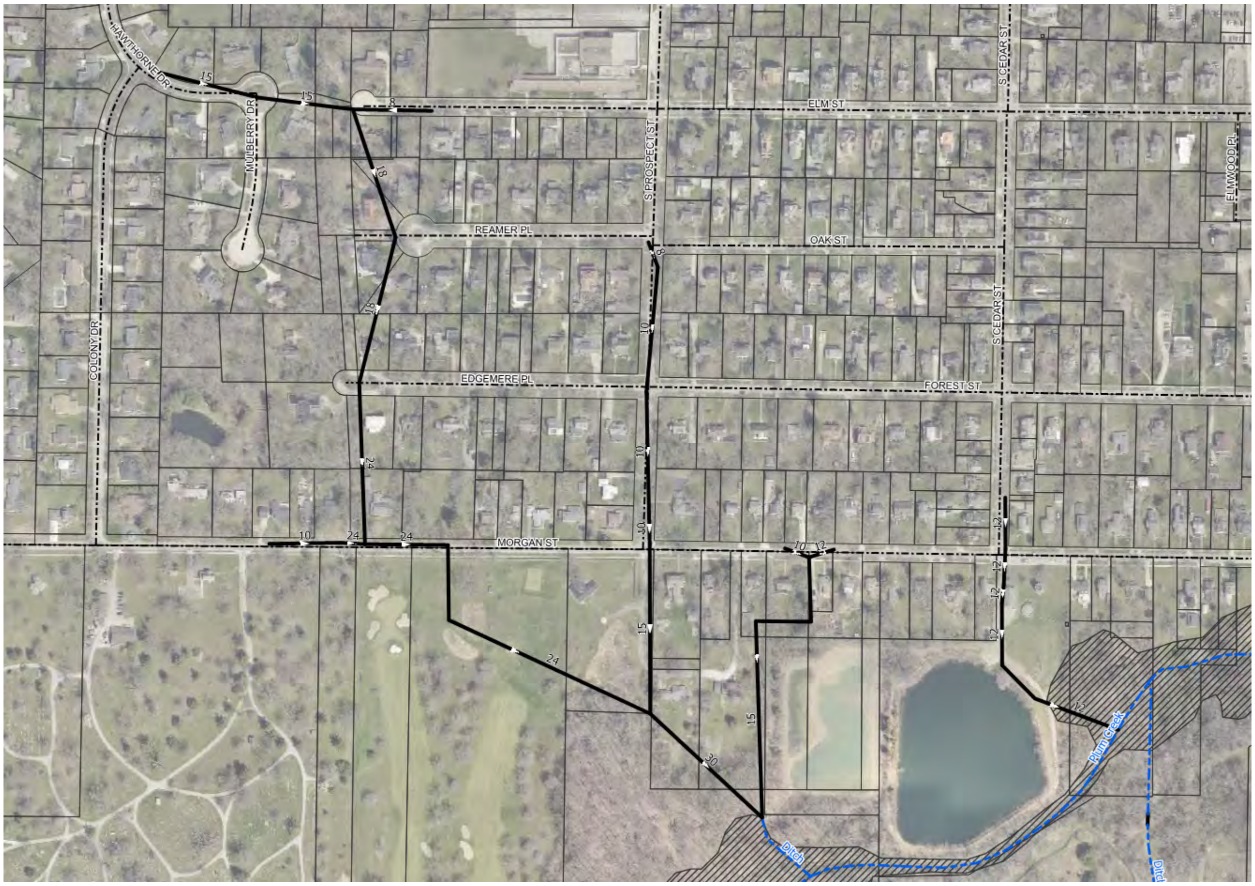



*Figure 2.3: S. Prospect Sewershed*

The results of the stormwater modeling showed higher potential flood depths in the areas of the Elm St. and Edgemeer Pl. cul-de-sacs and near Morgan St. Flood complaints have been submitted by residents on Elm St., Reamer Pl., Edgemeer Pl., Morgan St., and S. Cedar St. Flood raster maps for this sewershed can be found below and on Sheet 2 of Appendix D.

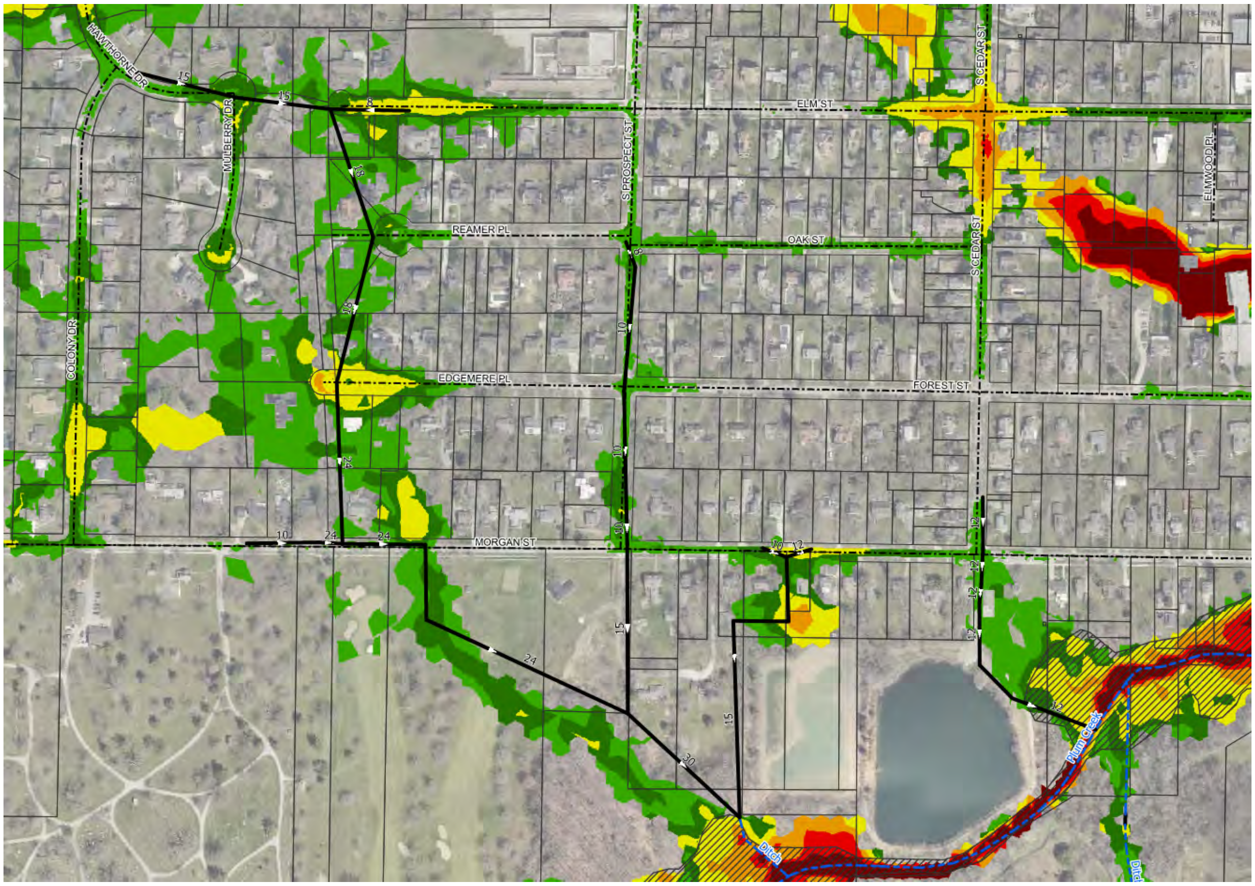



*Figure 2.4: S. Prospect 100-Year Flood Raster*

## 2.3 Lincoln Sewershed

The Lincoln Sewershed contains three storm sewer outfalls. The western system collects runoff from the western portion of Lincoln St. and travels north, through private property. From there it travels under the North Coast Inland Trail and outlets into Plum Creek. The central system collects runoff from Roosevelt Ct., Washington Cir., Monroe Ct., and most of Lincoln St. The branches of this system combine at a structure on Lincoln St. and travel north under the North Coast Inland Trail, across the Oberlin College arboretum. From there, it outlets to a ditch, continuing north through three private culverts along the way to its confluence with Plum Creek. The eastern system collects runoff from S. Professor St., routes east across Legion Field and outlets to Evans Ditch. The Lincoln Sewershed Map can be found below and on Sheet 3 of Appendix C.

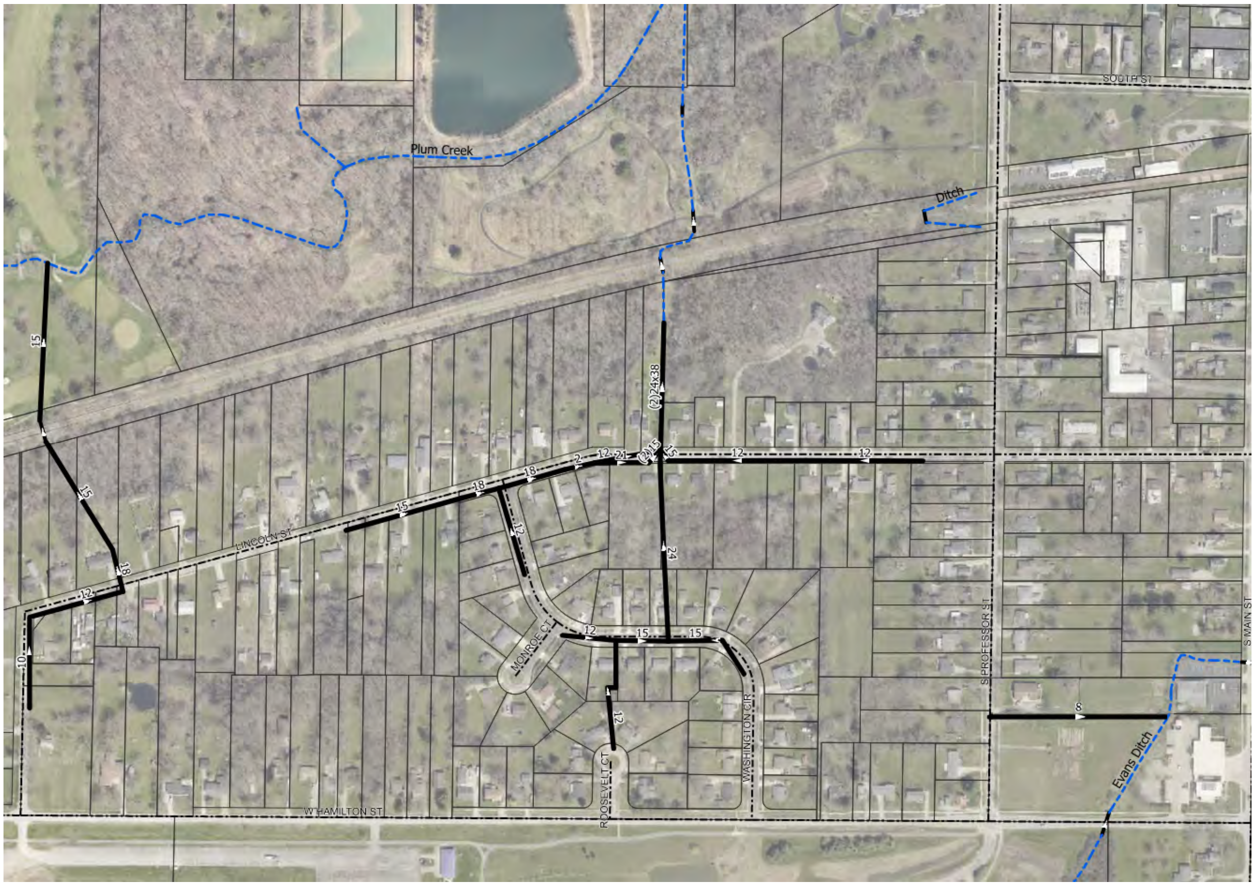



*Figure 2.5: Lincoln Sewershed*

The stormwater model shows continuing modest flooding potential along Washington Cir., and at the outlets of all three systems. Another flood-prone area is identified between Lincoln St. and Washington Cir. Flood raster maps for this sewershed can be found below and on Sheet 3 of Appendix D.

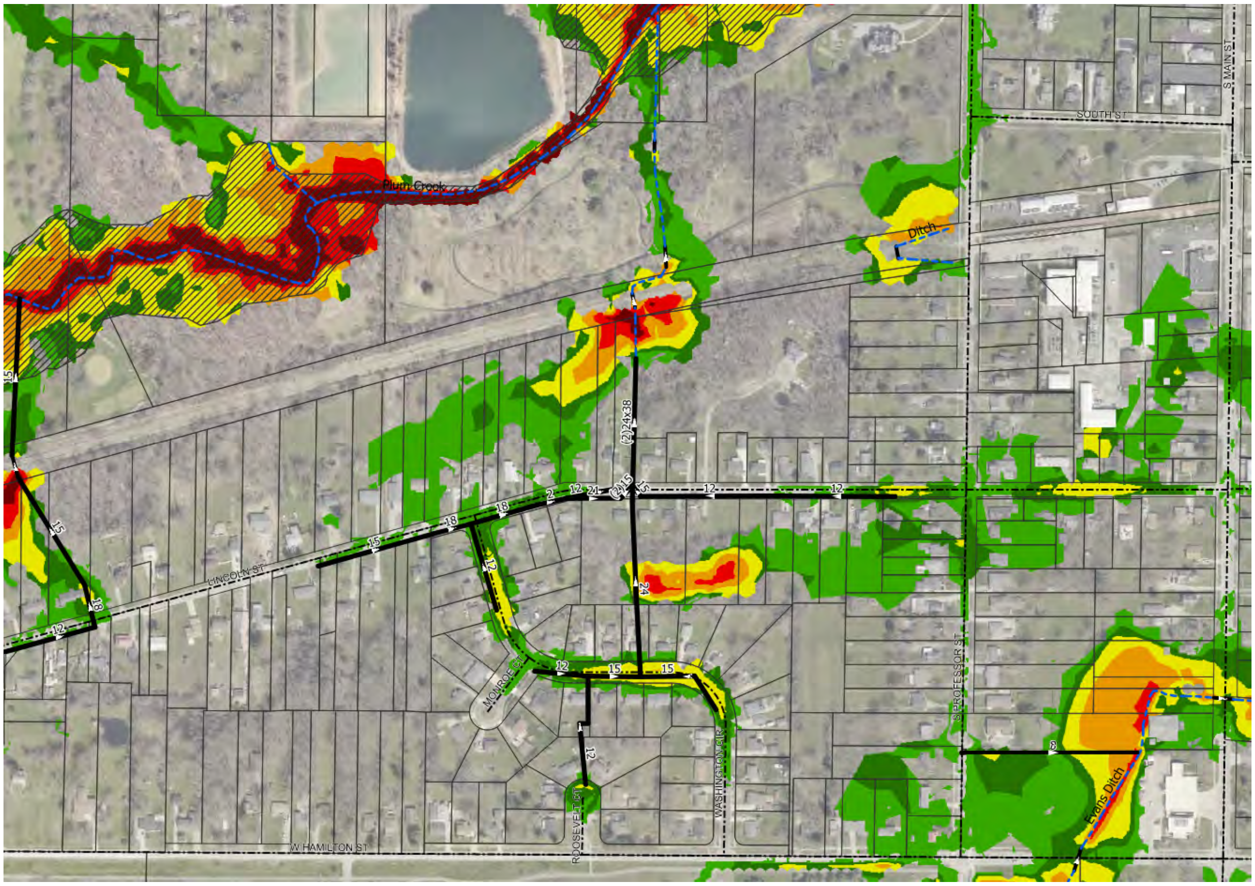



*Figure 2.6: Lincoln 100-Year Flood Raster*

## 2.4 West Vine Sewershed

This sewershed's main storm sewer system outlets through a 60-inch storm sewer under W. Vine St. across S. Main St. to Plum Creek under the E. Vine St. bridge. It has two main tributary collector sewers, a 36-inch storm sewer flowing in a southerly direction through the central part of the Oberlin College campus and a 36-inch storm sewer flowing southeasterly from the W. Lorain/N. Prospect area. These 36-inch storm sewers join at the Oberlin College south campus, into a 48-inch storm sewer. This flows east across S. Professor St., joins with a 24-inch branch from Forest St./S. Professor St. and continues through the 60-inch storm sewer on W. Vine St. A second storm sewer system collects runoff from S. Professor St., south of Plum Creek, and travels north to outlet into Plum Creek. The W. Vine Sewershed Map can be found below and on Sheet 4 of Appendix C.

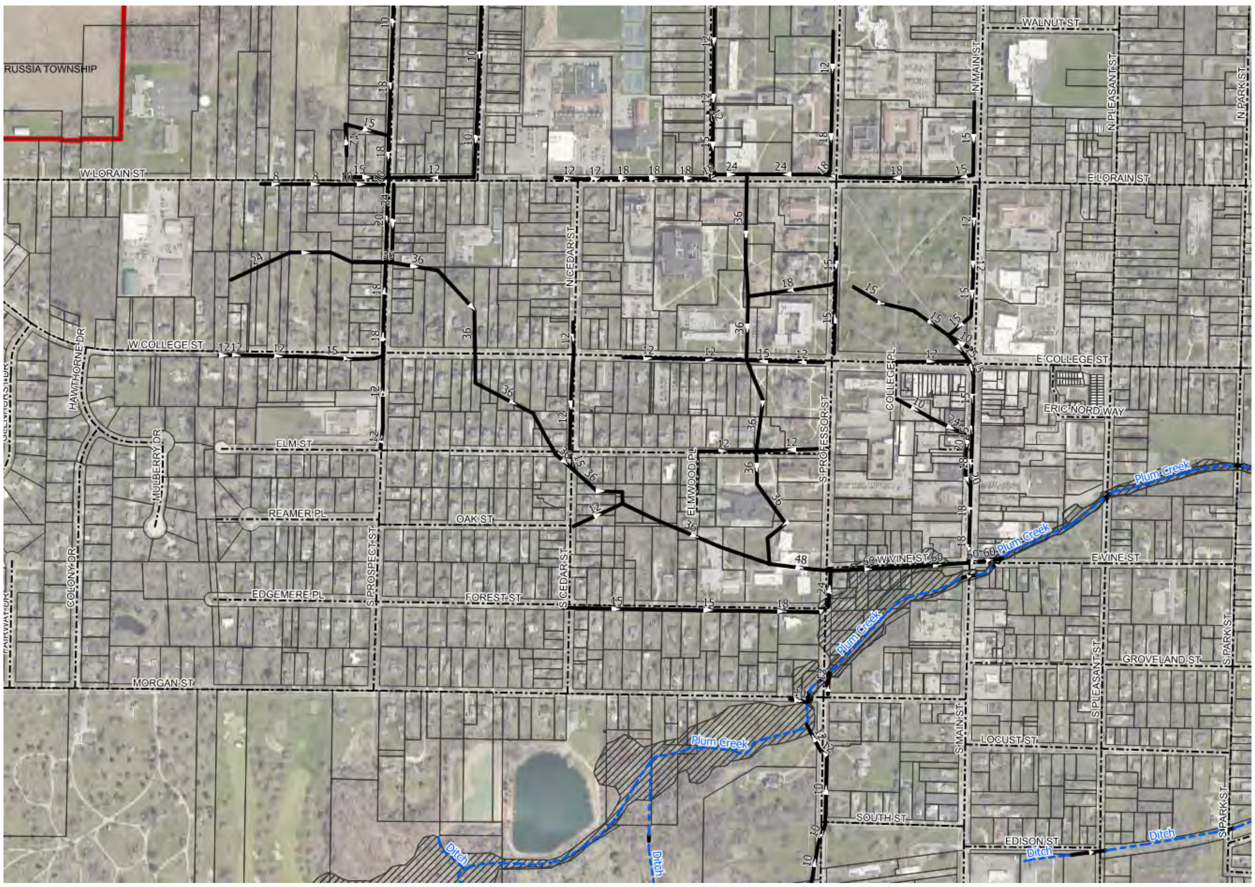



*Figure 2.7: W. Vine Sewershed*

Key flooding areas were indicated along the northwestern storm sewer branch on N. Prospect St., W. College St., Elm St., S. Cedar St. and W. Vine St. While the model indicates significant flooding potential in the south campus bowl between S. Cedar St. and S. Professor St., Oberlin College personnel do not report significant flooding in this area. Modeled flooding along N. Prospect St. between W. Lorain St. and W. College St., between N. Prospect St. and N. Cedar St. and on S. Cedar St., between Oak St. and Elm St. has been observed on multiple occasions. Flooding has been seen along W. Vine St., substantially as predicted. Flood raster maps for this sewershed can be found below and on Sheet 4 of Appendix D.

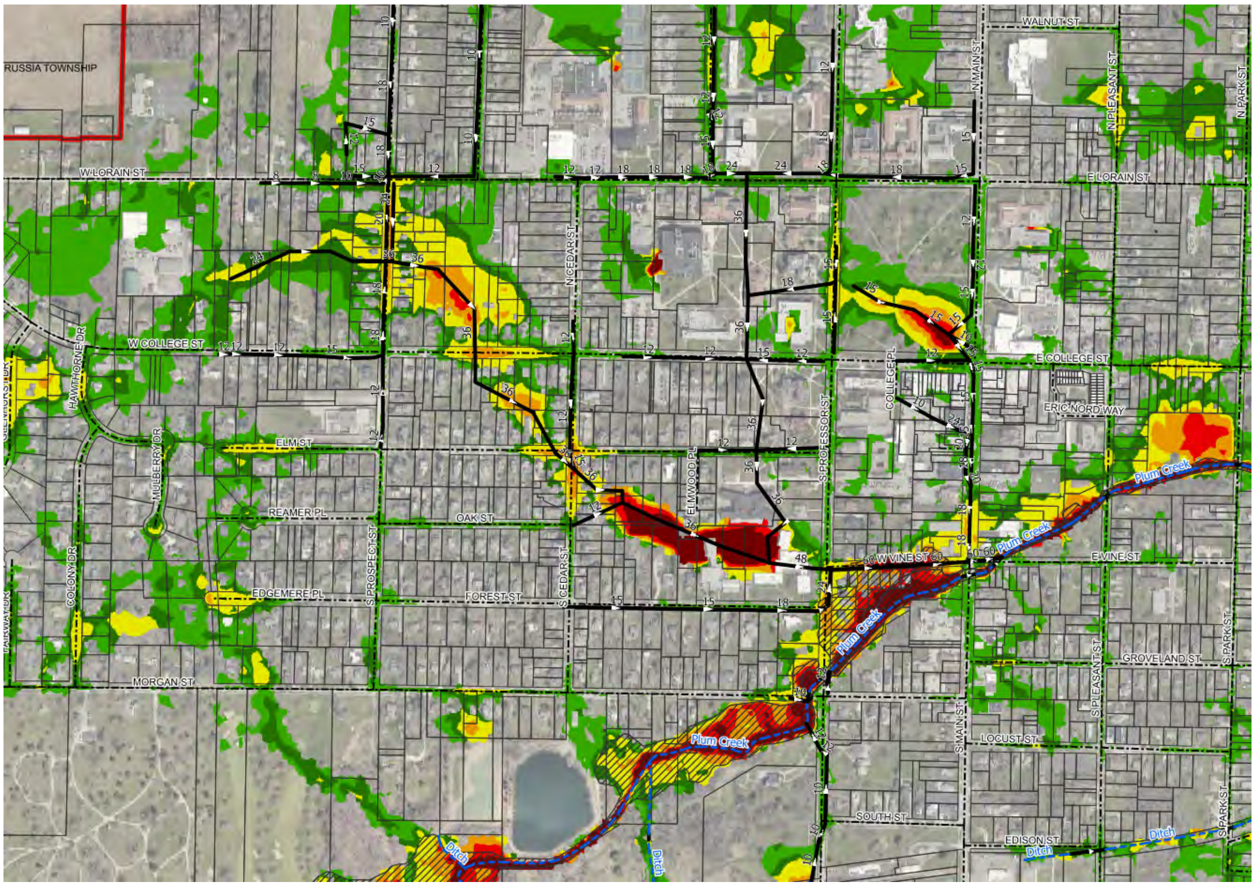


*Figure 2.8: W. Vine 100-Year Flood Raster*

## 2.5 East Vine – South Pleasant Sewershed

This Sewershed contains numerous smaller storm sewer branch systems east of S. Main St. with outlets into Plum Creek. The longest system has a maximum pipe size of 18 inches and collects runoff extending south to Locust St. Another storm sewer system collects runoff along E. Vine St. and S. Pleasant St. The largest storm sewer outlet is 24 inches, which collects drainage from City-owned and private property, north of Plum Creek. The E. Vine – S. Pleasant Sewershed Map can be found below and on Sheet 5 of Appendix C.


*Figure 2.9: E. Vine – S. Pleasant Sewershed*

The stormwater model results show flood-prone areas along the length of and adjacent to Plum Creek. The 18-inch branch storm sewer indicates flooding potential on Locust St. and Groveland St. Significant flooding is also predicted on City of Oberlin and Oberlin Public Library properties situated along Plum Creek northeast of the N. Main St. and E. Vine St. intersection. Flood raster maps for this sewershed can be found below and on Sheet 5 of Appendix D.

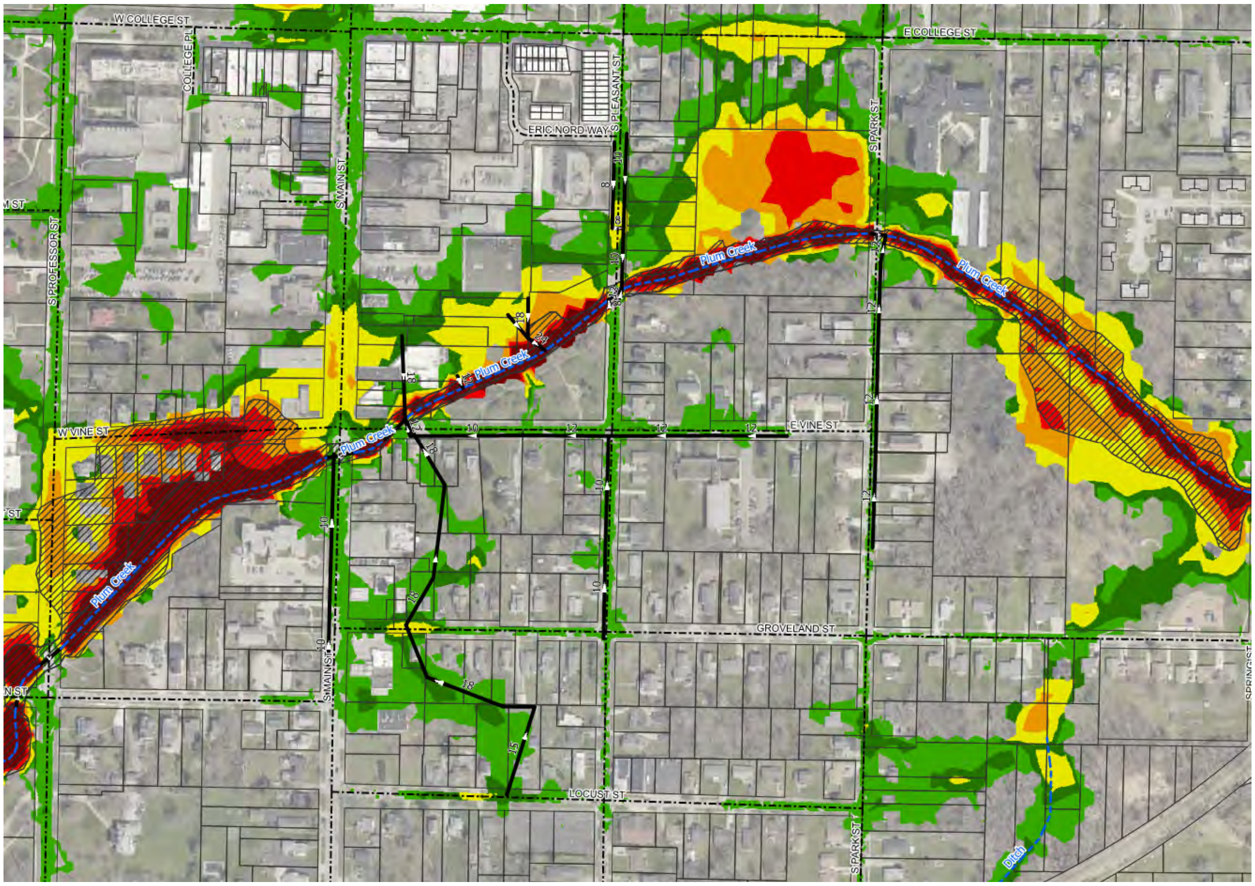



*Figure 2.10: E. Vine – S. Pleasant 100-Year Flood Raster*

## 2.6 North Park – South Park Sewershed

There are two outfalls to Plum Creek for the N. Park – S. Park storm sewer system. The main trunk sewer runs along Park St. from north to south. The system has branches along E. College St. and E. Lorain St. This system contains two bypass storm sewers, one that intercepts flow at E. College St. and one that travels south and southwesterly across private property before merging with the main trunk line on N. Park St. The N. Park – S. Park Sewershed Map can be found below and on Sheet 6 of Appendix C.

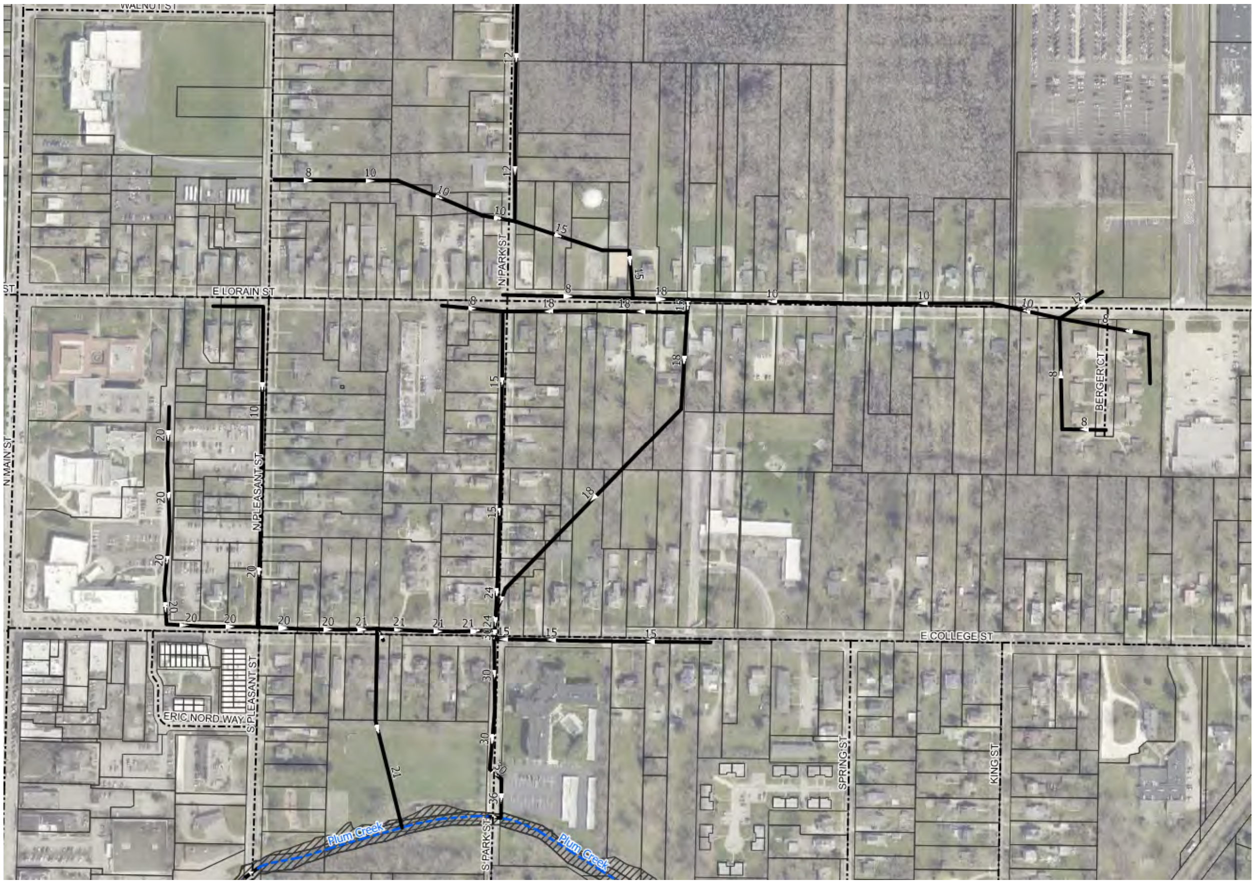



*Figure 2.11: N. Park – S. Park Sewershed*

Results from the stormwater model indicated significant flooding potential at Park St. Park, between S. Pleasant St. and S. Park St. Significant flood potential is also shown at E. College St. at the location of the 21-inch storm sewer bypass, although this has not been observed in the field. The model shows substantial flood depths all along the main trunk sewer west to the Oberlin City School District bus storage and Langston Middle School. Substantial flooding during storm events has been recorded along this storm sewer branch, especially north of E. Lorain St. Flood raster maps for this sewershed can be found below and on Sheet 6 of Appendix D.

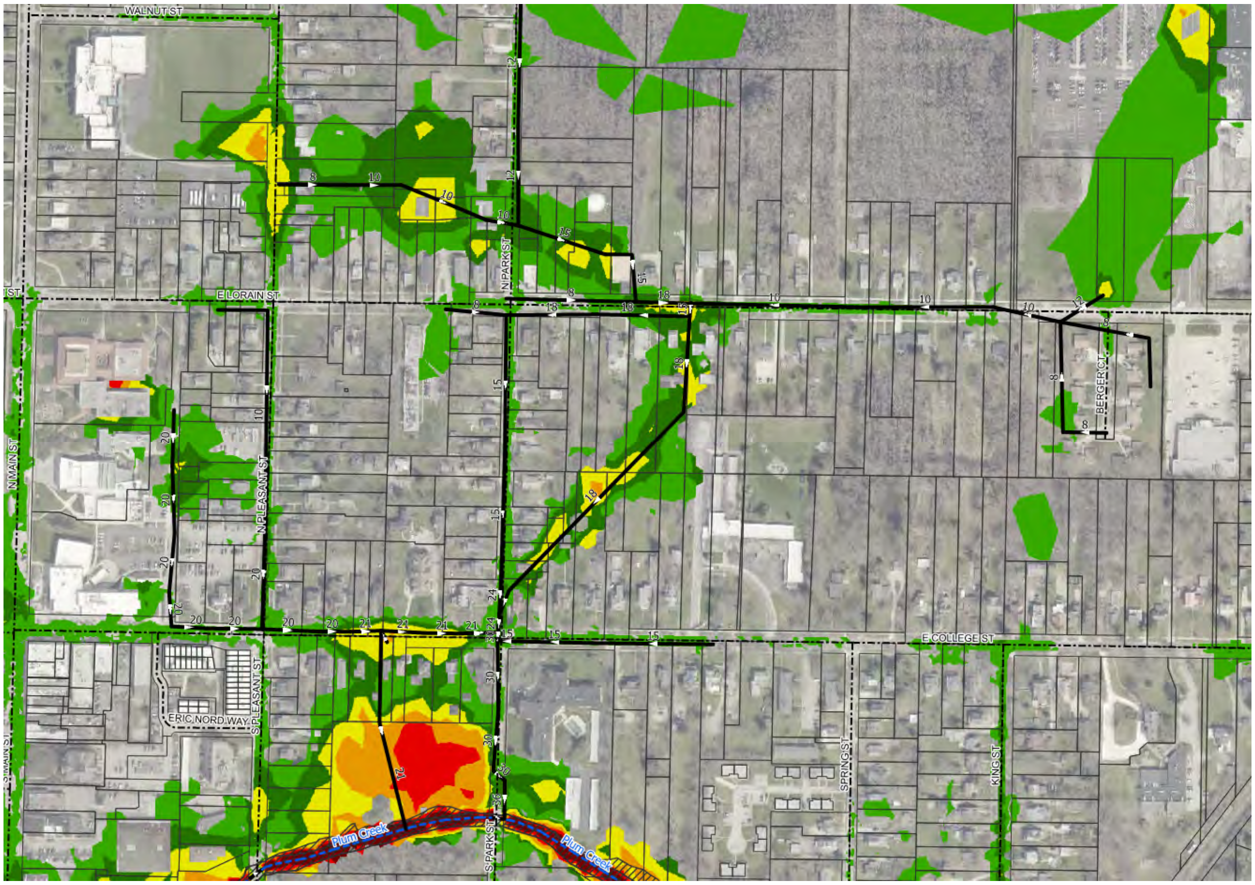



*Figure 2.12: N. Park – S. Park 100-Year Flood Raster*

## 2.7 South Park – Groveland Sewershed

This sewershed has four outfalls into Plum Creek. The southwestern storm sewer system has a main trunk sewer that stretches southwesterly across S. Main St. to Lincoln St. with branches on adjacent streets. This system outlets to Plum Creek through a 30-inch storm sewer underneath Spring St. Park. There is also a ditch that runs just north of the bike path that collects other storm sewers and surface drainage. The other three outfalls collect runoff from Spring St. The S. Park – Groveland Sewershed Map can be found below and on Sheet 7 of Appendix C.

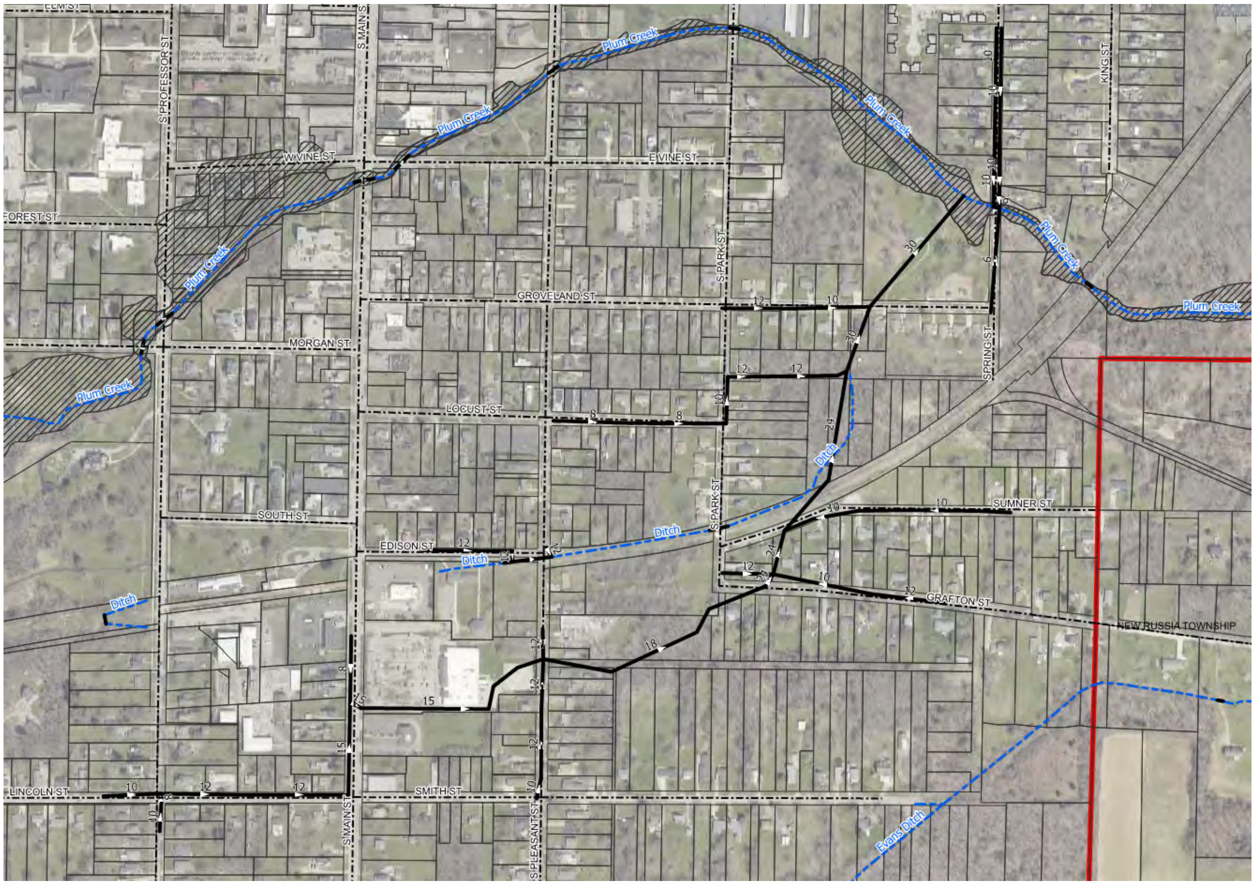



*Figure 2.13: S. Park – Groveland Sewershed Map*

The stormwater model indicates flooding potential where a 12-inch conduit combines with the main 24-inch trunk sewer, south of Groveland St. and east of S. Park St. Further up the trunk sewer there is more significant flood potential on Sumner St. and Grafton St. near the intersections with S. Park St. and the bike path. Residents have reported drainage issues and flooding in this area. Substantial flood depths were also shown along the trunk sewer just west and east of S. Pleasant St. Flooding has been observed along Lincoln St., west of S. Main St. Flood raster maps for this sewershed can be found below and on Sheet 7 of Appendix D.

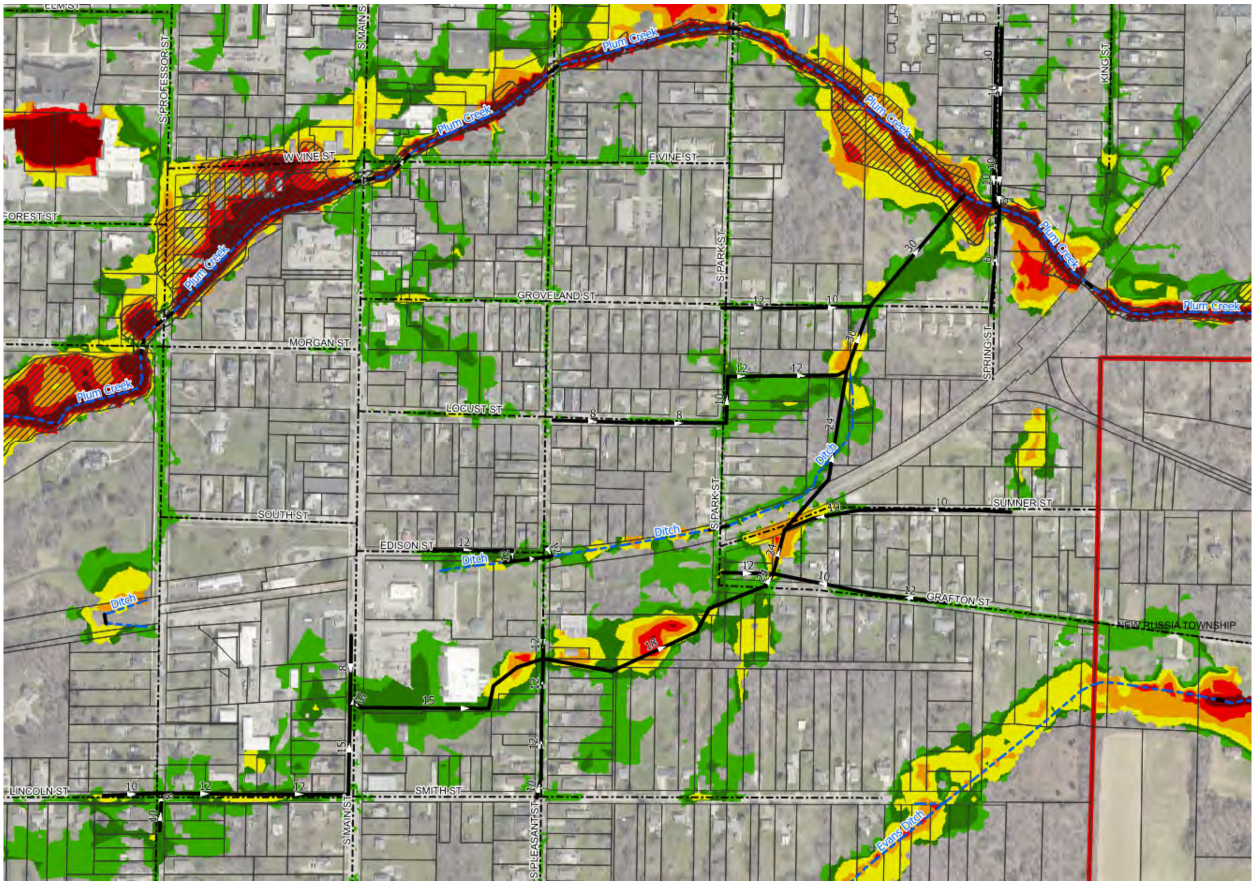


*Figure 2.14: S. Park – Groveland 100-Year Flood Raster*

## 2.8 King – Shipherd Sewershed

The King-Shipherd sewershed contains four outfalls to Plum Creek. The western storm sewer system collects stormwater from E. College St. and King St. and outlets to Plum Creek. The eastern system collects runoff from Orchard St., E. College St., and Caskey Dr., with three distinct outlets to Plum Creek. The King - Shipherd Sewershed Map can be found below and on Sheet 8 of Appendix C.

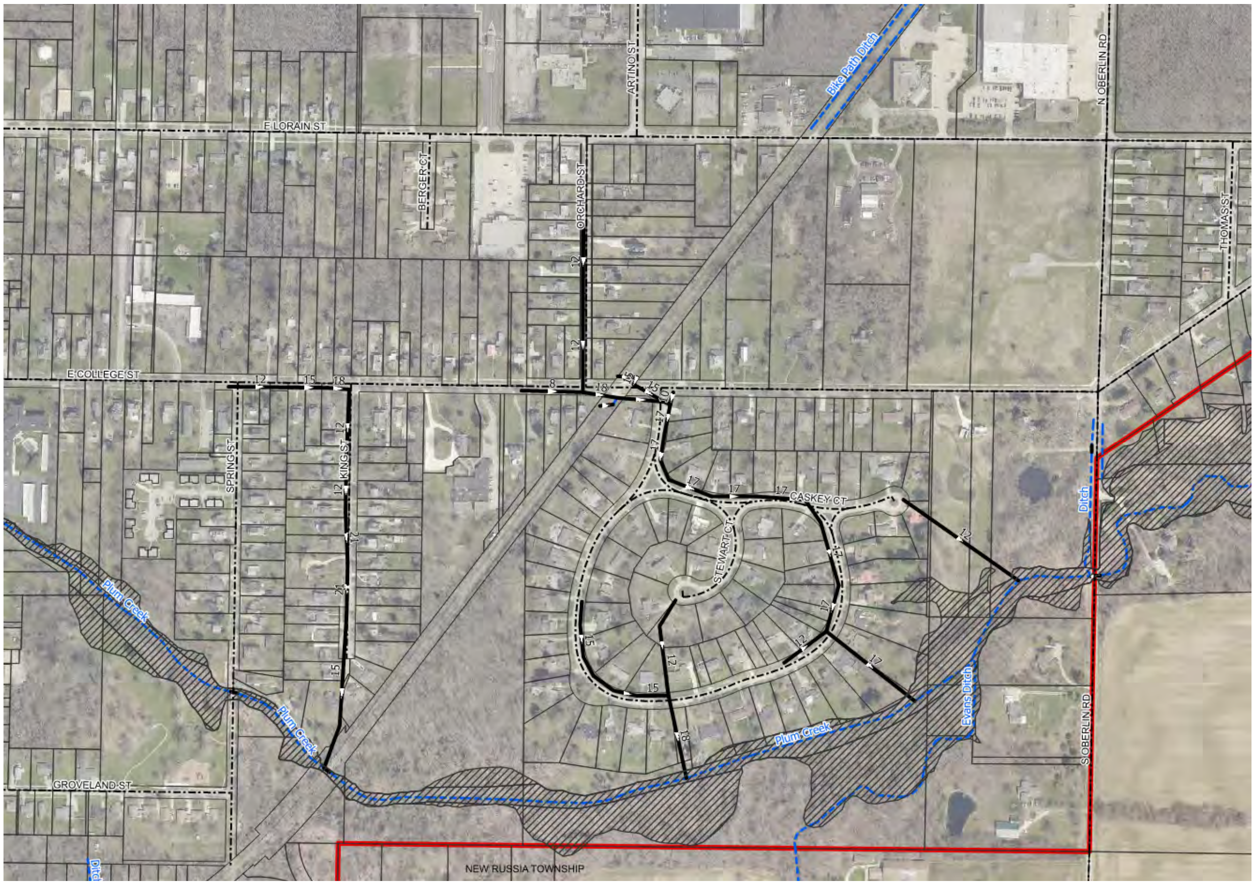


*Figure 2.15: King – Shipherd Sewershed*

The flood simulation of the stormwater model indicates higher flood-prone areas near the south end of King St., near the intersection of the bike path and E. College St. and at various locations near the main trunk sewer along Caskey Dr. Residents have reported drainage issues and flooding in this area. Flood raster maps for this sewershed can be found below and on Sheet 8 of Appendix D.

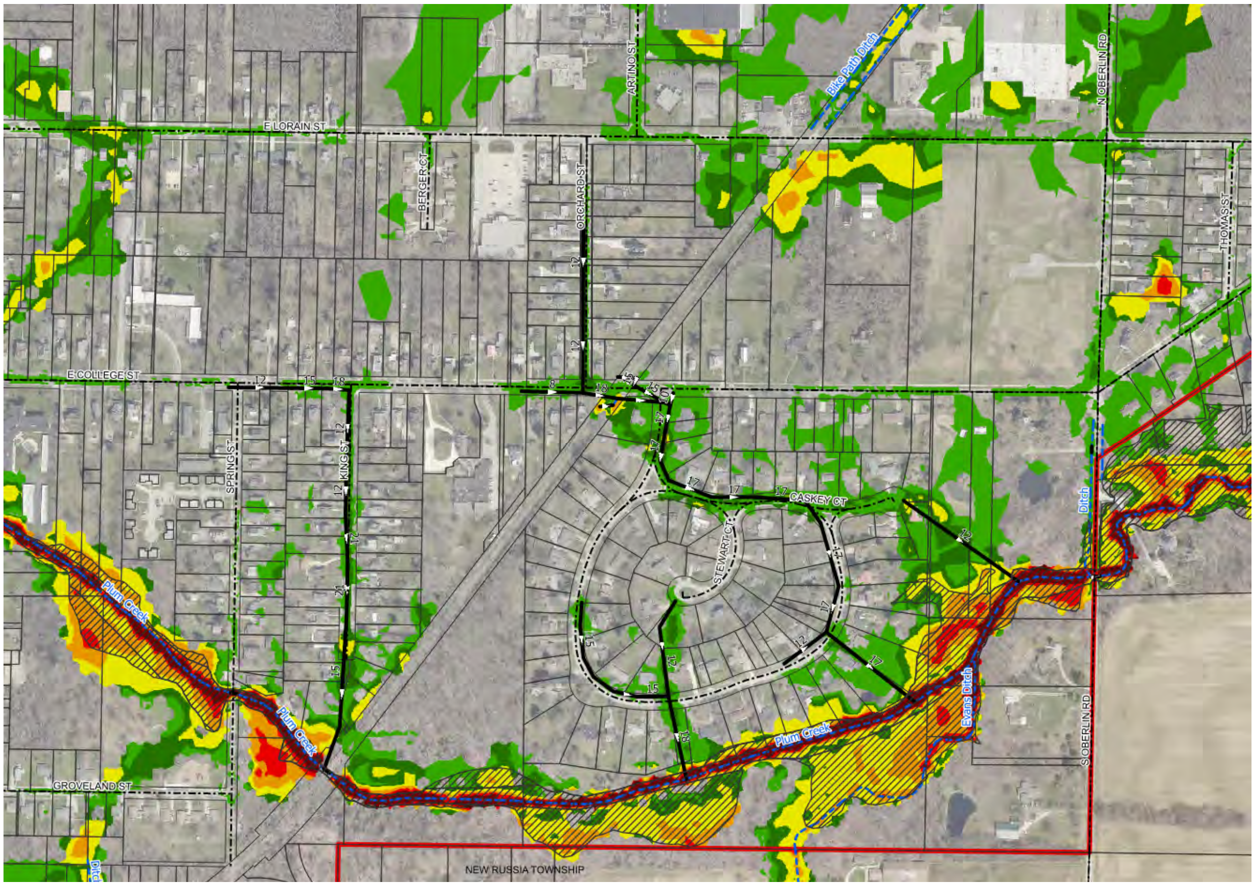



*Figure 2.16: King – Shipherd 100-Year Flood Raster*

## 2.9 North Professor Sewershed

There are three outfalls within the N. Professor sewershed. The western storm sewer system captures stormwater from Eastern Ave., travels across property owned by Oberlin College and outlets to a tributary of Herrick Ditch. Another storm sewer system collects runoff along N. Prospect St. and outlets north to grade. The eastern system begins at Hollywood St., and flows east through Oberlin College property to Union St. From there, it travels north through Oberlin College property until it reaches N. Professor St. Unmapped drainage system(s) in Oberlin College's athletic fields are believed to connect to and outlet through this system. The storm sewer continues north, outside the city corporation limits, into New Russia Township and outlets into a tributary of Herrick Ditch. The N. Professor Sewershed Map can be found below and on Sheet 9 of Appendix C.

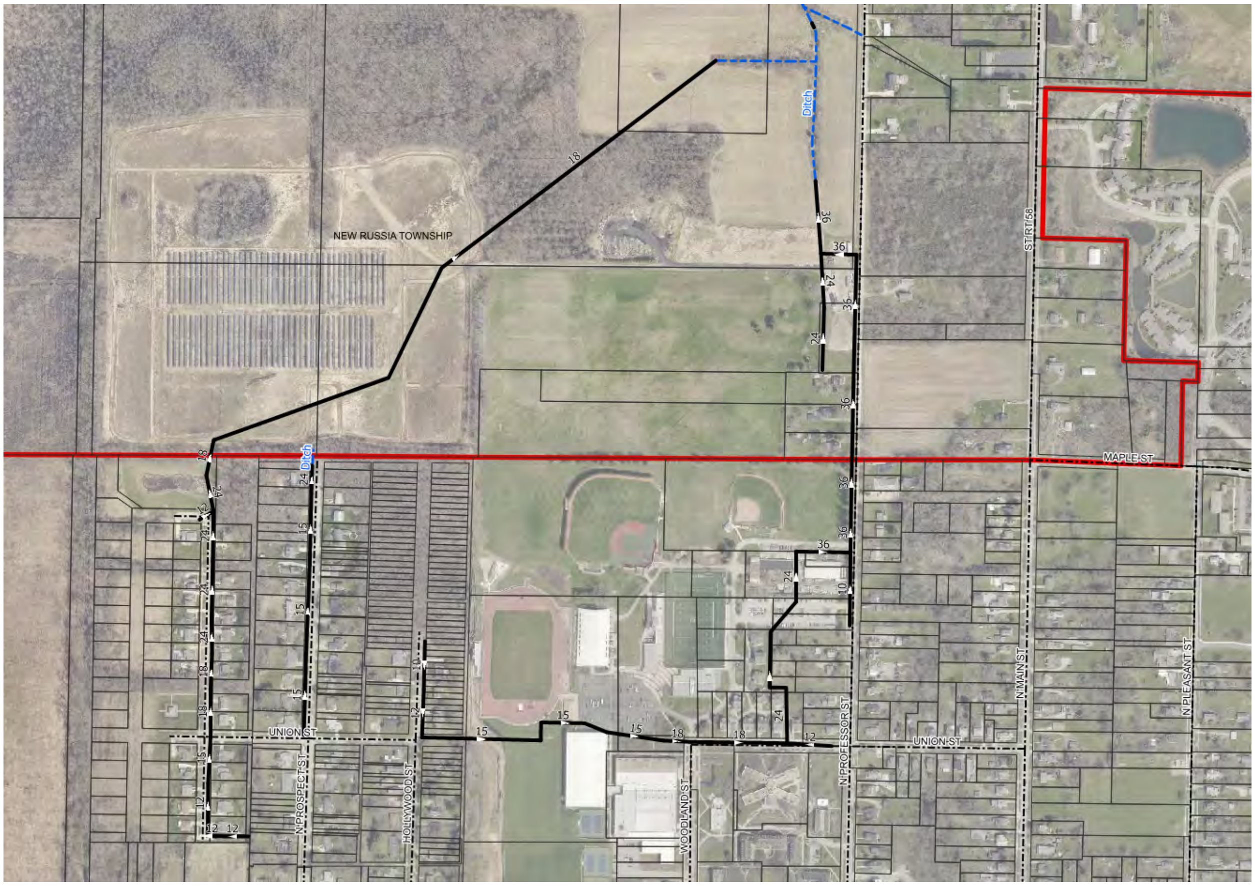



*Figure 1.17: N. Professor Sewershed*

The stormwater model predicts flooding potential along Eastern Ave., Union St., N. Prospect St., and Hollywood St., all west of Oberlin College's athletic fields. Flood potential is also shown on Union St. between Woodland St. and N. Professor St. and on Oberlin College property to the north of Union St. Flooding in this area has been confirmed by city staff and college personnel. Ponding water was shown between N. Professor St. and N. Main St., south of Union St. This pond of water appears to have an outlet that is directly connected to the sanitary sewer along Union St. This inflow may intensify capacity issues with the sanitary sewer system. Flood raster maps for this sewershed can be found below and on Sheet 9 of Appendix D.

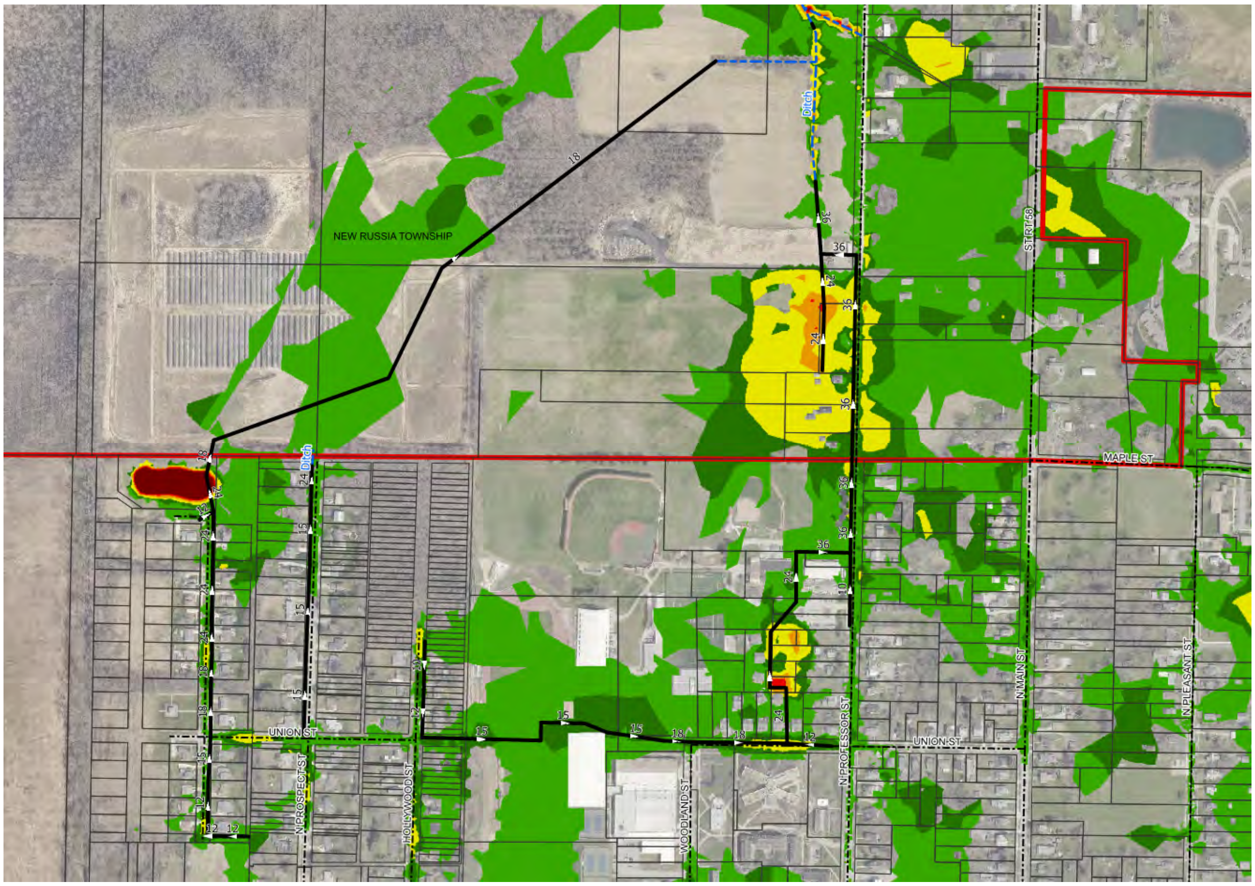



*Figure 2.18: N. Professor 100-Year Flood Raster*

## 2.10 Maple Sewershed

There are two outfalls within the Maple Sewershed. The western storm sewer system contains storm sewers along N. Main St., Maple St., Walnut St., and N. Pleasant St. A branch of this system collects runoff from the eastern end of Maple St. and from the College Village Apartment complex. The system combines on N. Pleasant St. and routes east through the Oberlin City School District campus, where it outlets into a tributary ditch of Hill Creek. A second system is located on the Kendal at Oberlin's facility services complex, which contains a tributary ditch that collects runoff from the Kendal at Oberlin and ties into Hill Creek. The Maple Sewershed Map can be found below and on Sheet 10 of Appendix C.

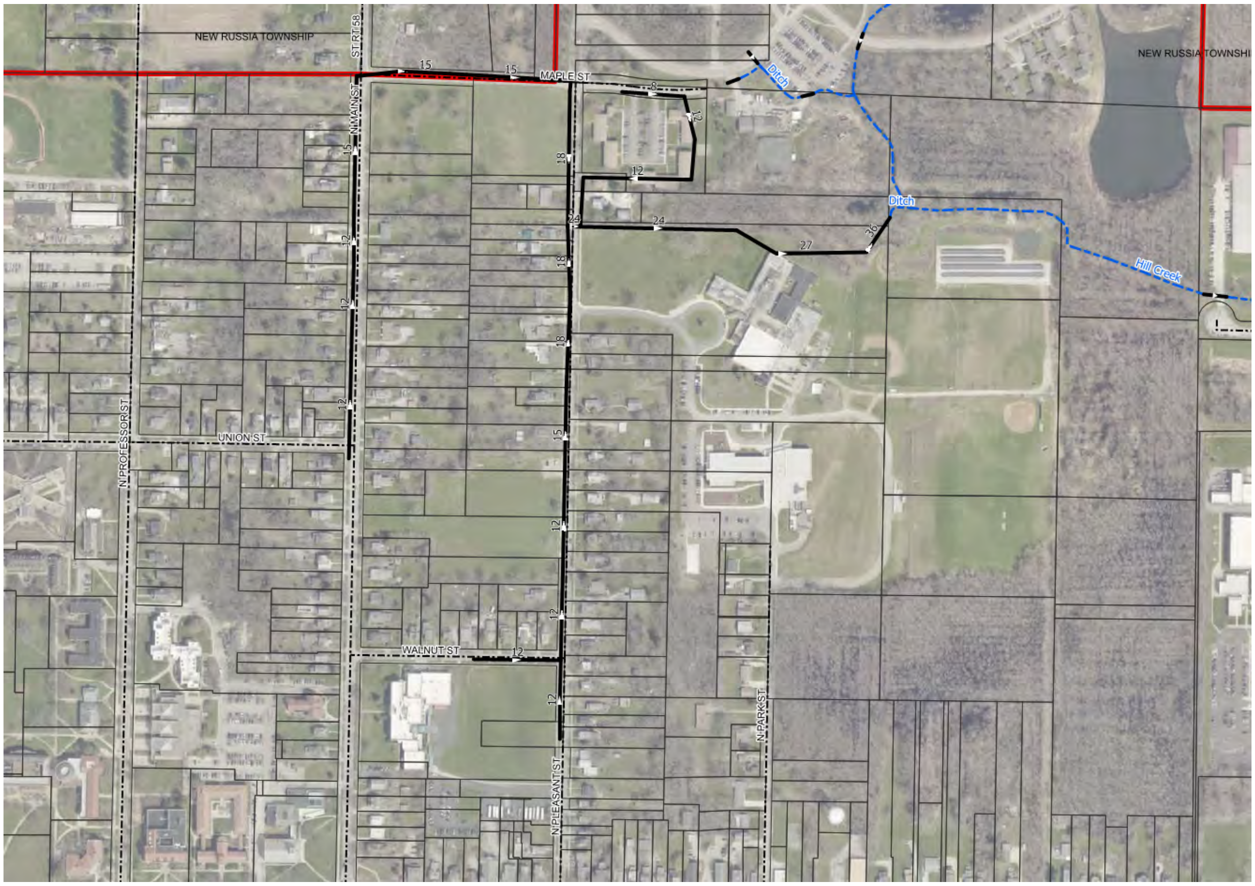



*Figure 2.19: Maple Sewershed*

Significant flooding potential is shown by the stormwater model just west of Oberlin Senior High School. Another flood-prone location is detected on N. Pleasant St., south of Walnut St. Substantial flooding has been observed in this area, as modeled. Overflow may go east and south into the North Park-South Park Sewershed (see 2.6, above). The tributary ditch that runs through the Kendal at Oberlin Facility Services complex also indicates significant flood potential. Flood raster maps for this sewershed can be found below and on Sheet 10 of Appendix D.

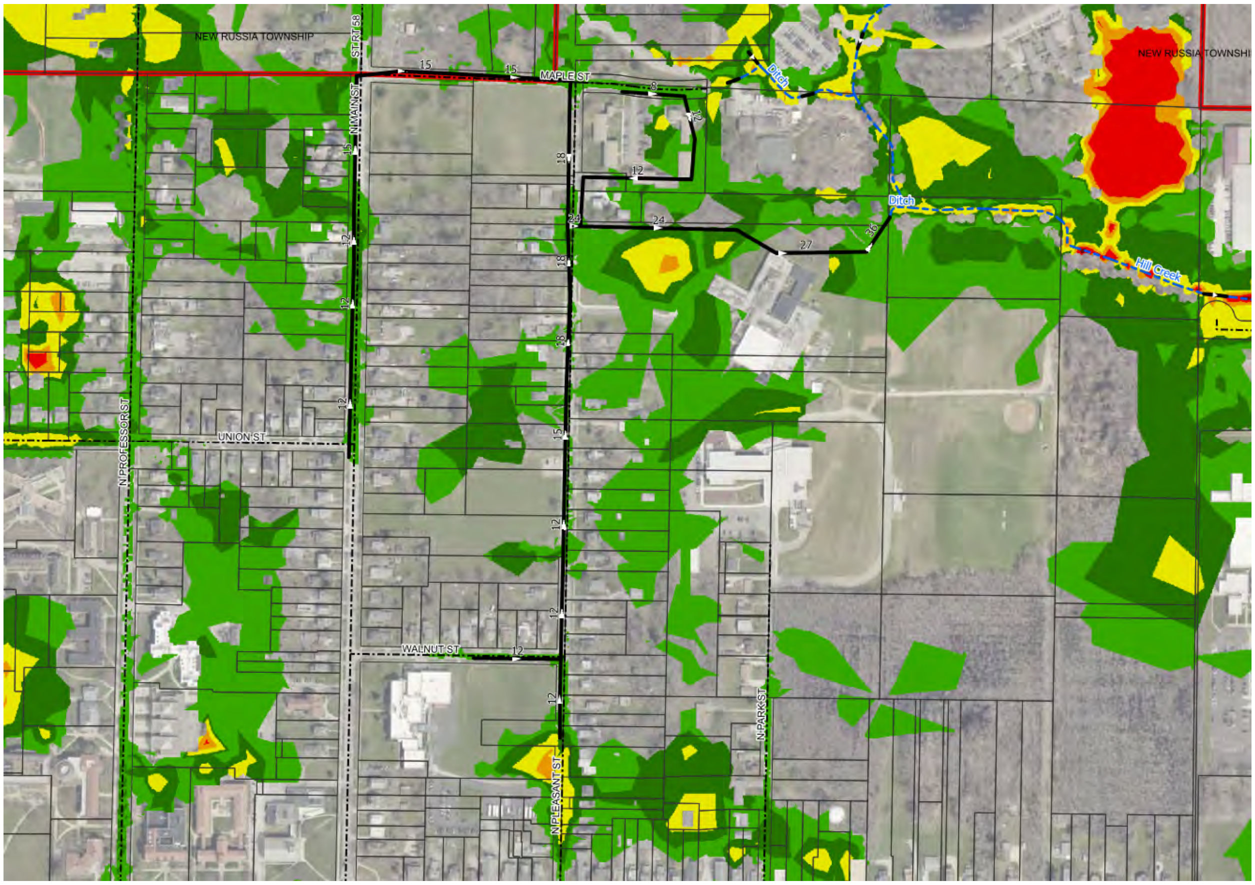



*Figure 2.20: Maple 100-Year Flood Raster*

## 2.11 Artino Sewershed

The Artino Sewershed contains 6 outfalls along Hill Creek. The westernmost system collects runoff from the Federal Aviation Administration (FAA) Cleveland Air Route Traffic Control Center and outlets into Hill Creek. There are two systems that run along Artino St., one to the north, and one to the south, both routed to Hill Creek. Another system runs along Stern St., through private property along a utility easement, and outlets to Hill Creek. There is also a system that collects stormwater along E. Lorain St. and outlets into the bike path ditch. The ditches on each side of the bike path are routed to the northwest and flow to Hill Creek. The Artino Sewershed Map can be found below and on Sheet 11 of Appendix C.

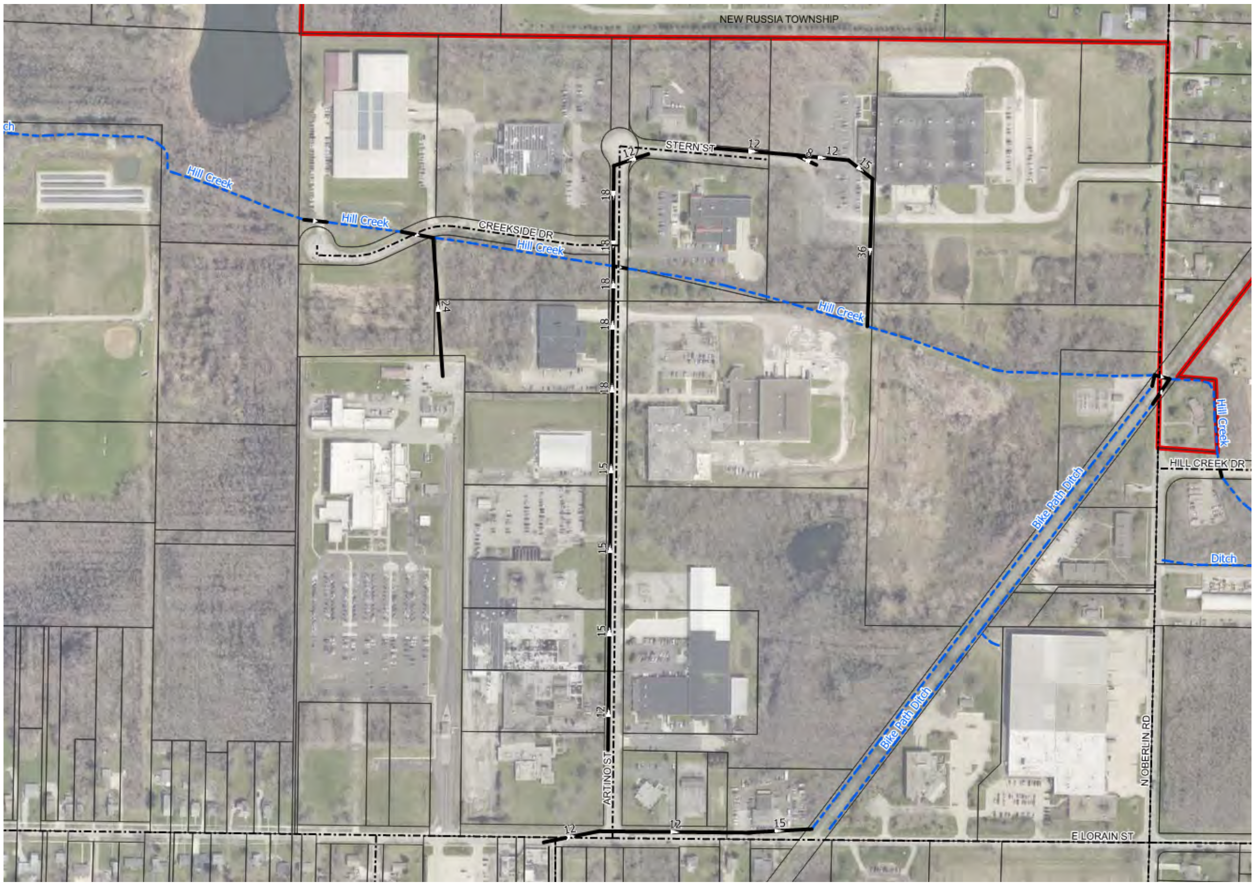



*Figure 2.21: Artino Sewershed Map*

There is substantial flooding potential shown by the model along Hill Creek throughout this sewershed. This is especially true along Creekside Dr. and west of N. Oberlin Rd., due to lack of maintenance along this surface drainageway. The Creekside Dr. cul-de-sac also shows significant flood potential. Artino St., immediately south of Hill Creek also shows significant modeled flood depths. Flood raster maps for this sewershed can be found below and on Sheet 11 of Appendix D.

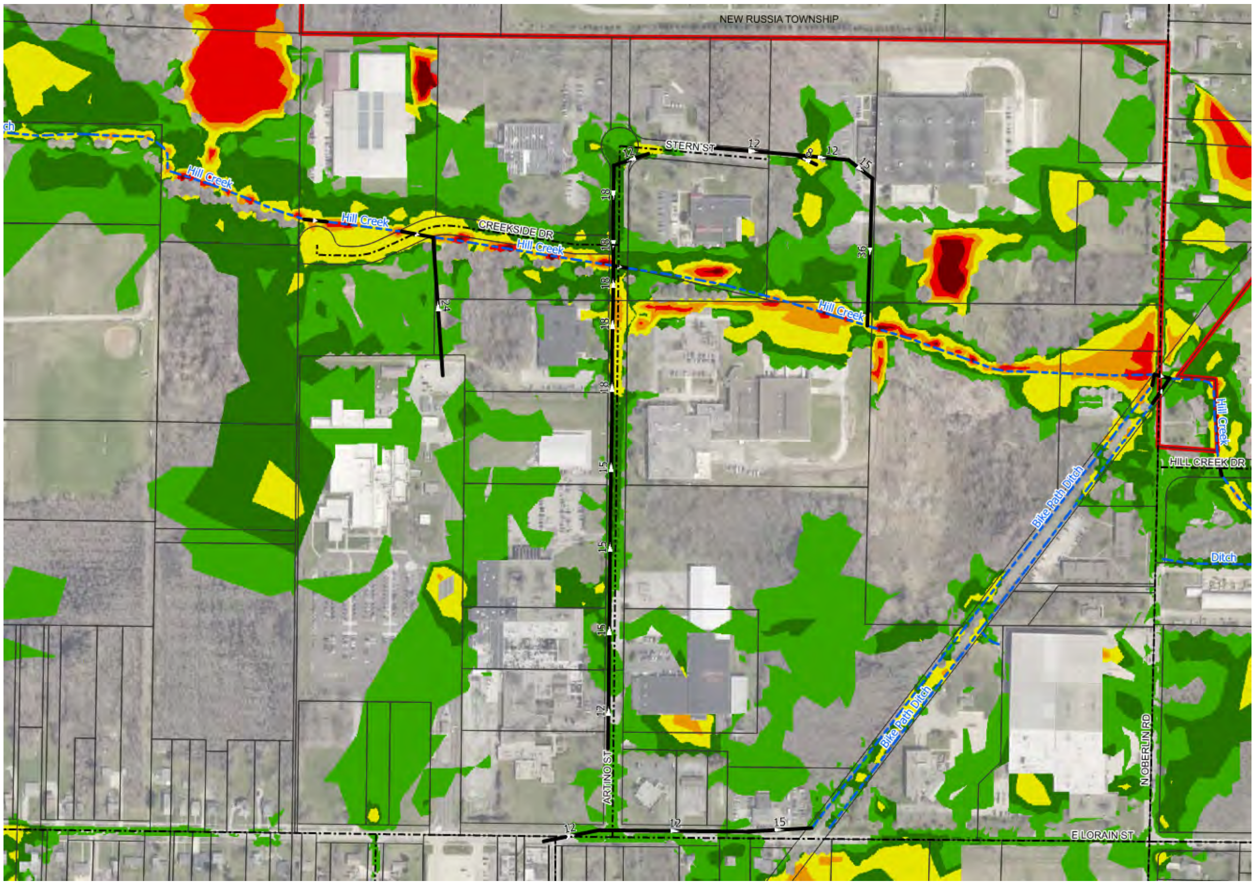



*Figure 2.22: Artino 100-Year Flood Raster*

## 2.12 North Oberlin – East Lorain Sewershed

There are numerous storm sewer systems contained within this sewershed, with outfalls along Hill Creek and Plum Creek. A system on N. Oberlin Rd. collects runoff and outlets to a tributary ditch of Hill Creek, east of N. Oberlin Rd. Another system runs along E. Lorain St. with a branch on E. College St. and outlets to Hill Creek. Kimberly Cir. has four separate systems, with one outfall to Hill Creek, one to a tributary ditch of Hill Creek, and two to Plum Creek. There is a storm system on Willowbrook Dr. as well, which outlets to Hill Creek. E. College St. contains two storm sewer systems, routed on each side of S. Oberlin Rd. and both have outlets to Plum Creek. The N. Oberlin – E. Lorain Sewershed Map can be found below and on Sheet 12 of Appendix C.

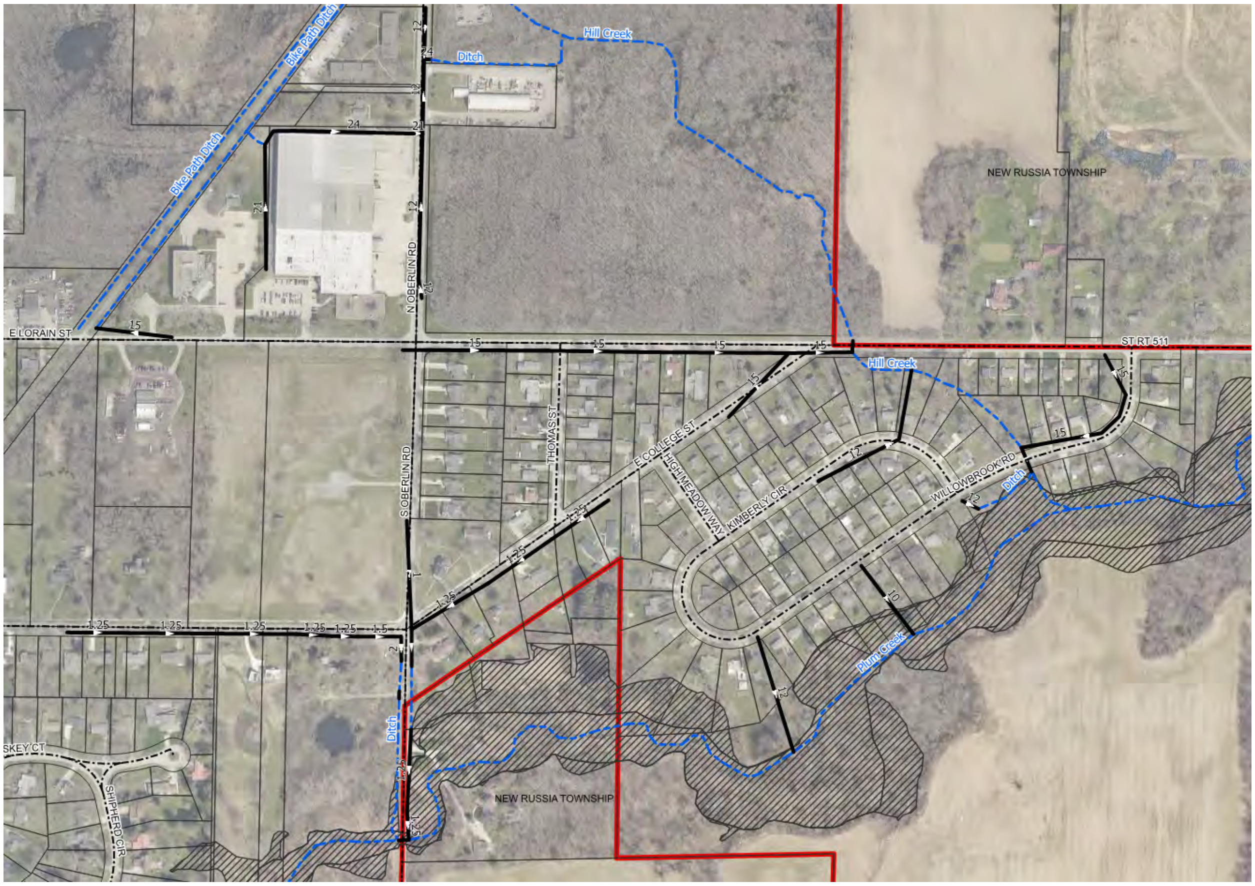



*Figure 2.23: N. Oberlin – E. Lorain Sewershed*

Results from modeling this sewershed show significant flooding potential along Hill Creek, particularly near E. Lorain St. and Willowbrook Dr. Significant flood depths are also modeled along Plum Creek, throughout this sewershed, consistent with the FEMA Flood Insurance Rate Maps. Another flood prone area was identified near the bike path, south of E. Lorain St. Flood raster maps for this sewershed can be found below and on Sheet 12 of Appendix D.

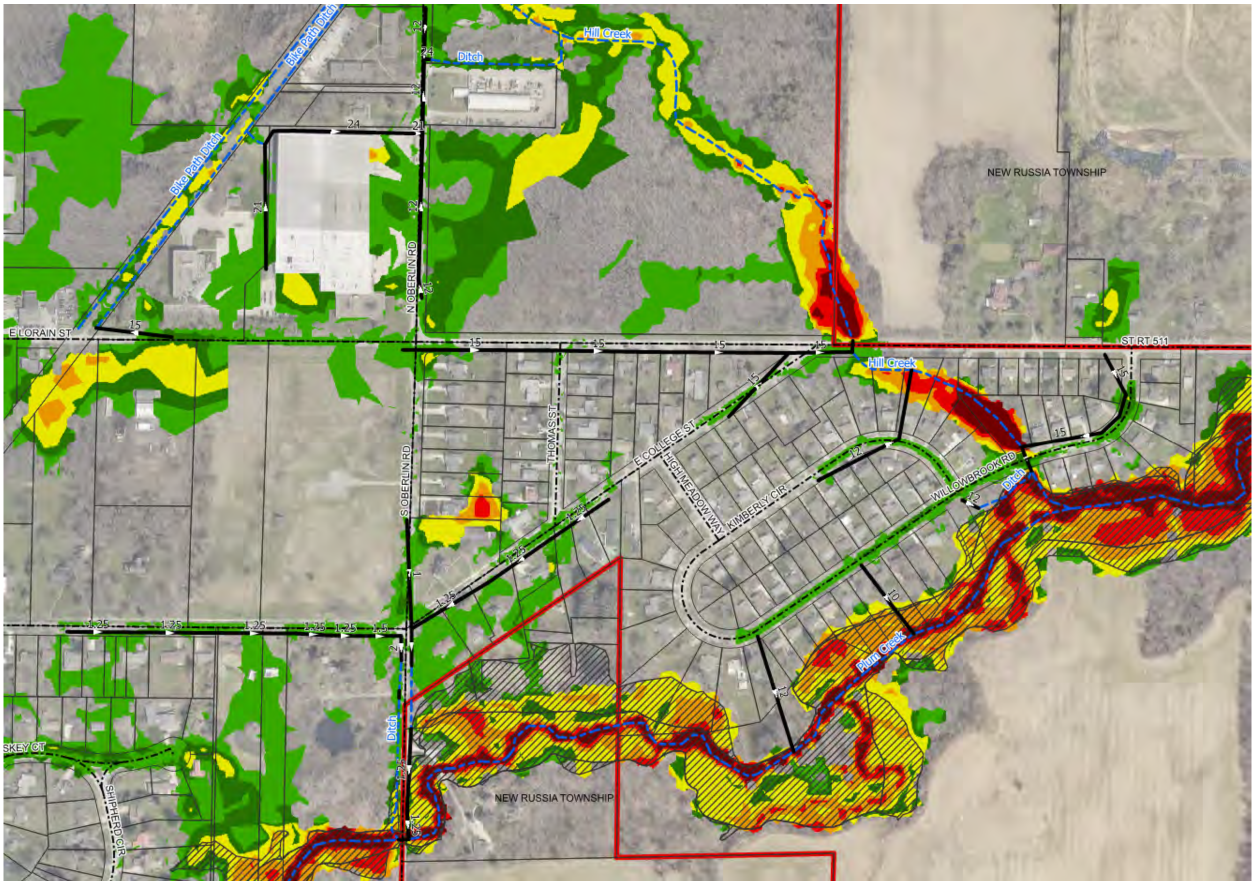



*Figure 2.24: N. Oberlin – E. Lorain 100-Year Flood Raster*

## 2.13 Reserve Sewershed

The Reserve Sewershed contains one outfall to Evans Ditch and two to Gott Ditch. A 15-inch storm sewer located along the rear (north) property lines of Reserve Ave., west of Jefferson St., collects surface drainage from New Russia Township properties to the west and the adjacent properties on the north side of Reserve Ave. and conveys it through the system to its outlet at Evans Ditch.

The second system runs along Reserve Ave., collecting runoff from Reserve Ave., Jefferson St., Washington St., Nantucket Cir., and Canterbury Dr. This system is routed through a detention basin located at the southeast corner of the subdivision, west of S. Main St. (OH-58). The basin outlet combines with a branch that runs along both sides of S. Main St. (OH-58). This system contains a bypass sewer and outlets on each side of S. Main St. (OH-58) into Gott Ditch which drains to the west branch of the Black River. The Reserve Sewershed Map can be found below and on Sheet 13 of Appendix C.

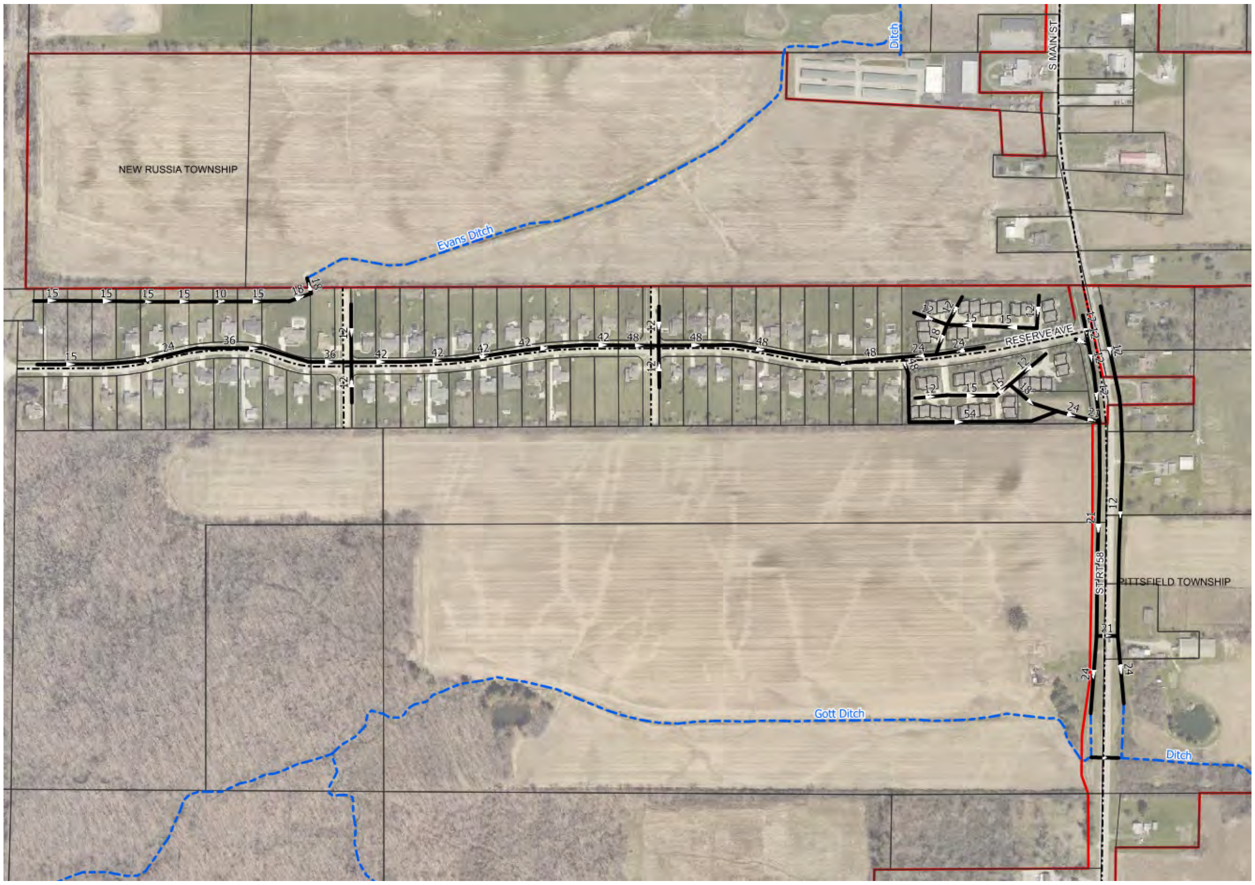



*Figure 2.25: Reserve Sewershed*

Modeling results show significant flooding potential, especially at the western end of the Reserve Ave. subdivision. This has been observed and recorded during heavy rain events by both City personnel and residents. Just north of the Reserve Subdivision, substantial flood depths were depicted along Evans Ditch. The eastern end of the subdivision also shows flood potential near the entrance, which has also been witnessed during significant rain events. The model shows higher flood depths along S. Main St. (OH-58), specifically along the west side of the road. Flood raster maps for this sewershed can be found below and on Sheet 13 of Appendix D.

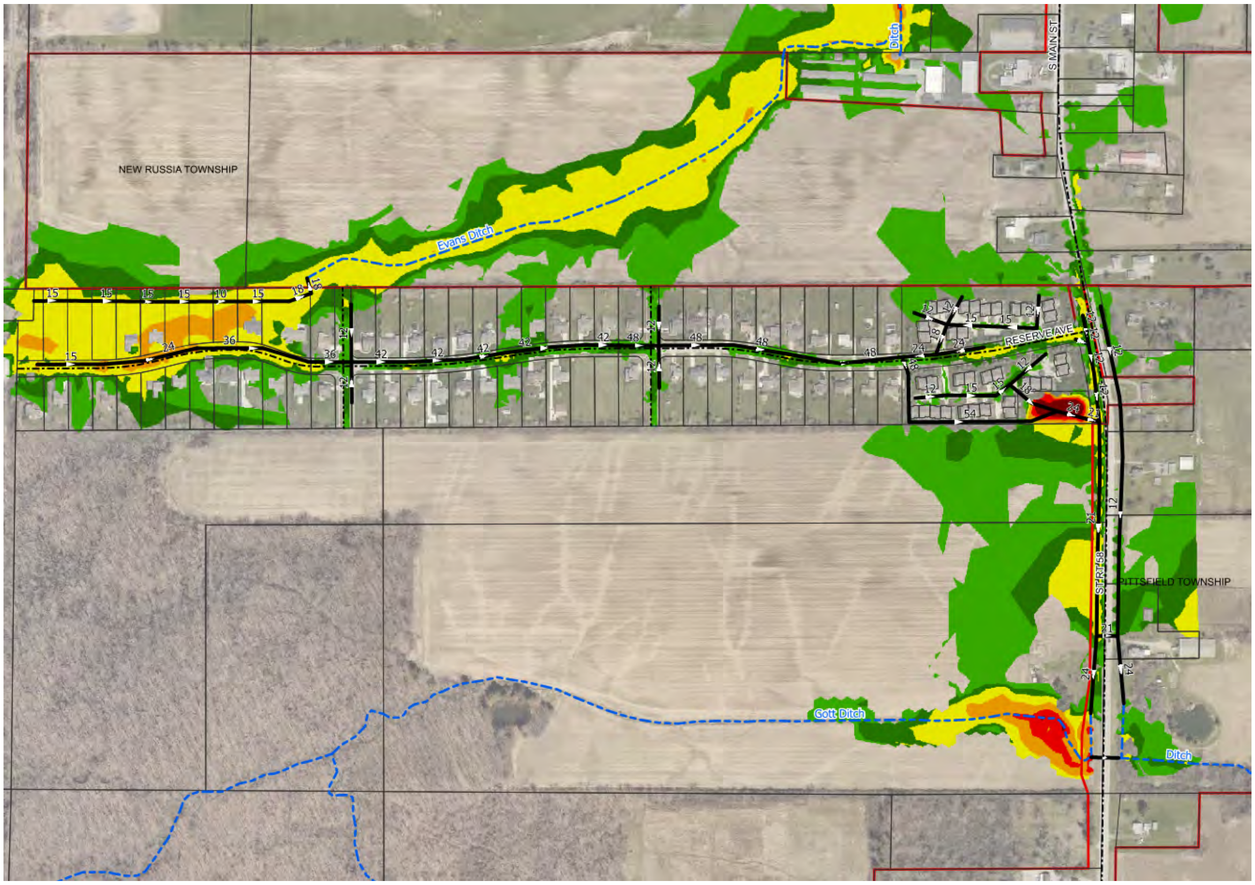



*Figure 2.26: Reserve 100-Year Flood Raster*

## 2.14 S. Main Sewershed

There are 11 outfalls to Evans Ditch within the S. Main Sewershed. Two systems collect runoff from W. Hamilton St. and outlet to Evans Ditch. There is a system that routes stormwater from S. Professor St. across the City's Legion Field property into Evans Ditch (see 2.3 Lincoln Sewershed, above). Two systems located along S. Main St., one north of Evans Ditch and one south, transport runoff to the ditch. S. Pleasant St. also contains two storm sewer systems, one north of Evans Ditch and one south, both with outlets to the ditch. There is an outlet to Evans Ditch from Gladys Ct. that travels through private property, which contains a storm sewer easement. A storm system along Smith St. outlets to a roadside ditch, south of the street, and flows to Evans Ditch. Grafton St. has a storm system that is routed south through private property with an outlet to Evans Ditch. The S. Main Sewershed Map can be found below and on Sheet 14 of Appendix C.

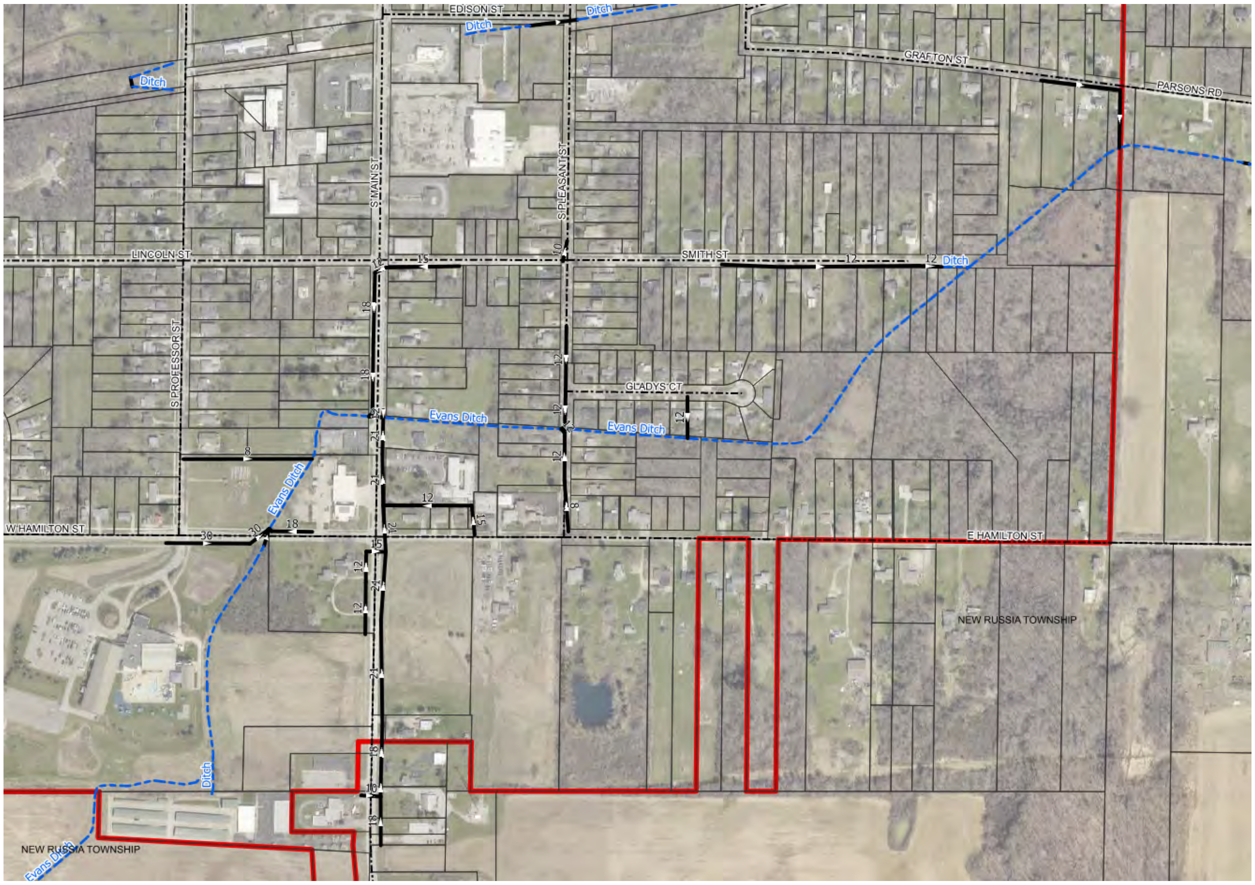



*Figure 2.27: S. Main Sewershed*

The results of the model predict flooding along Evans Ditch throughout the sewershed. Critical areas with significant flood potential are where Evans Ditch intersects with W. Hamilton St., S. Main St. and S. Pleasant St. Residents on Gladys Ct., which runs parallel with Evans Ditch, have expressed concerns with maintenance of the ditch and flooding potential. Evans Ditch originates outside of city limits and receives runoff from land in New Russia Township (see 2.13 Reserve Ave. Sewershed, above). As the ditch enters the city, it collects stormwater from multiple storm sewer systems located on S. Main St. (OH-58), W. Hamilton St., S. Pleasant St., Gladys Ct., Smith St., and Grafton St. Flood raster maps for this sewershed can be found below and on Sheet 14 of Appendix D.

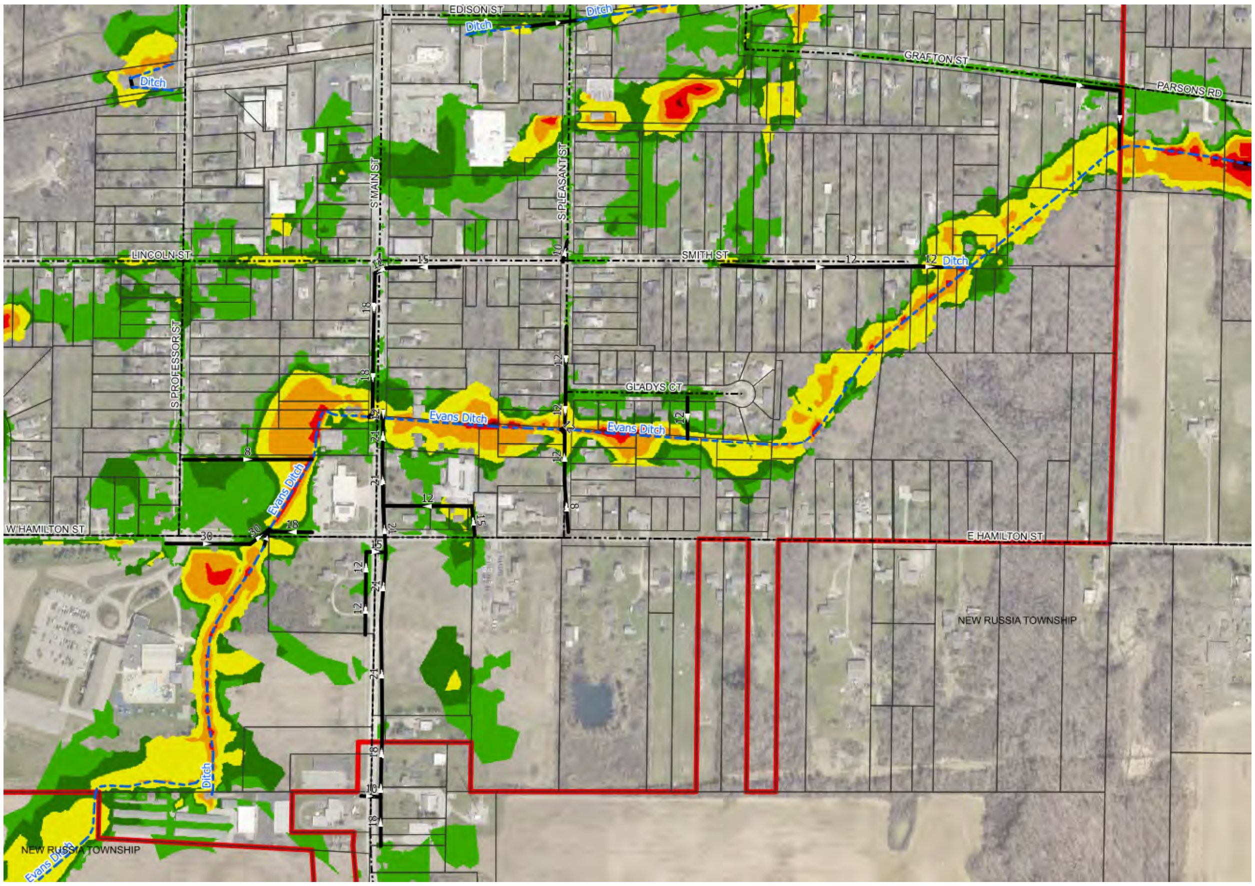



*Figure 2.28: S. Main 100-Year Flood Raster*

# 3. Investigative Priorities

## 3.1 Maintenance

A storm system maintenance program is critical for public safety, infrastructure longevity and regulatory compliance. Unmaintained storm sewers, culverts, and ditches may become clogged with debris, sediment, and vegetation. This may lead to localized flooding which in turn risks damage to homes, businesses, roads, and utilities, and can create safety hazards.

Routine inspection and cleaning can help to prevent premature failure of pipes, manholes, and culverts. Addressing small issues (blockages, joint separations, erosion) early is far less costly than emergency repairs or system replacement. Additionally, regular cleaning of storm systems reduces pollutant loads (debris, sediment, etc.) discharged into rivers and streams, which supports compliance with NPDES MS4 permits and other environmental regulations. The City of Oberlin is required to demonstrate inspection, maintenance, and recordkeeping programs as part of their MS4 program.

Proactive maintenance not only shows the public that infrastructure funds are being responsibly managed it also helps reduce complaints related to flooding, sinkholes, or standing water. The following prerequisites are important in a proactive maintenance program:

1. Inventory and Mapping: A GIS-based inventory of all stormwater assets including inlets, manholes, pipes, culverts, ditches, and detention basins provides a foundation for investigations, maintenance planning, and condition assessments. This inventory is also a requirement under the City's MS4 Permit.

2. Condition Assessments: Visual inspections and CCTV evaluations, using a standardized rating system, such as NASSCO's Pipeline Assessment Certification Program (PACP) and Manhole Assessment Certification Program (MACP), allows the City to quickly gauge maintenance or repair needs and prioritize resources effectively. A full inventory and assessment of the system improves understanding, reveals vulnerabilities, and guides targeted interventions. Inspections of culverts, open channels, and previously undocumented connections optimize hydraulic performance and prevent future disruptions. A sample inspection report can be located in Appendix E.

3. Storm Sewer Maintenance: Scheduling routine cleaning, repairs, and replacements based on sediment rates, land use changes, and blockage history optimizes resource allocation, reduces emergency interventions, and extends infrastructure lifespan. The use of jet and/or vacuum truck equipment keeps pipes clear. Trenchless rehabilitation may offer the opportunity to restore damaged sections with minimal surface disruption.

4. Ditch maintenance is critical for preserving flow capacity and reducing localized flooding. Public-right-of-way ditches should be cleared routinely, with added attention after major storms. For private-property segments, the City should coordinate temporary access and rely on easements for long-term maintenance. The City may also work with the County to use ORC 6117 and 6131 to establish access and funding for extended ditch sections on private property. Appendix F provides sample restoration specifications.

5. Access: Securing formal access agreements for storm system segments crossing private property ensures legal inspection rights, fosters cooperation, and protects long-term maintenance access. Negotiating temporary entry permits or permanent easements balances municipal needs with property owner concerns.

## 3.2 Field Assessments

To provide further insight into the priority locations and flooding outlined in Section 2, field assessments are necessary to validate existing data and confirm the site-specific conditions of the storm system. These on-the-ground surveys provide critical insights that support hydraulic modeling and help assess the structural integrity of key infrastructure components. They can also help to determine potential solutions to the flooding issues that may not be readily apparent through hydraulic modeling. Initial field assessments should target high risk assets and/or areas where flooding is affecting buildings and/or property.

Field crews should verify existing information including infrastructure sizes and elevations, ensuring that elevation profiles are accurate for flow analysis. Along Plum Creek and its tributary ditches, inspections should focus on identifying blockages and sediment buildup, which can restrict flow and increase localized flooding.

Drainage structures and their associated pipe connections must be thoroughly documented to confirm connectivity and assess maintenance needs. Additionally, collecting flow data during rainfall events will be vital for calibrating hydrologic models, allowing for more precise simulations of stormwater behavior under varying conditions. These assessments will form the foundation for targeted improvements and long-term system resilience.

## 3.3 Easements

Although the City of Oberlin is responsible for maintaining the public storm sewer network, many pipes and ditches extend across private parcels where no recorded easements exist. Additionally, it may not be clear that the City has responsibility for segment(s) that serve private property only. However, when public infrastructure ties into a system that runs through private property, it is in the public interest for this system to be maintained. The lack of legal right of access presents a challenge for inspection, maintenance and repair. Establishing clear access rights will be essential for maintaining system integrity and ensuring long-term serviceability.

A comprehensive easement strategy is crucial to ensure long-term access and protection of the City's stormwater infrastructure. The process begins with a thorough review of existing legal agreements, including recorded plats, property deeds, and utility corridor arrangements. This effort includes searching county and city records for documented easements and rights-of-way, identifying any that are unrecorded, expired, or informally established through long-term use. Where infrastructure has existed and been maintained over time without formal documentation, the City should evaluate the potential for prescriptive easements, which are legal rights acquired through continuous, open, and adverse use. Coordinating with legal counsel to validate these claims and negotiate new easements where needed strengthens the City's authority to inspect, maintain, and upgrade critical stormwater assets.

Once existing easements are identified, they should be digitally mapped in GIS and overlaid with the storm network to visualize coverage and gaps. This mapping effort will help pinpoint locations where stormwater facilities cross private property without formal access rights. By analyzing these gaps in relation to their importance within the storm sewer system, the City can develop parcel-level priorities for easement acquisition. This targeted approach will guide negotiations and legal coordination, ensuring that critical infrastructure is protected and accessible for future inspection, maintenance, repair, and improvement.

# 4. Administrative Priorities

## 4.1 Public vs. Private

A stormwater network includes local and regional management facilities, onsite conveyance systems, trunk sewers, roadside ditches, and natural waterways such as Plum Creek, Hill Creek, Evans Ditch, and Herrick Ditch.

Public stormwater systems generally consist of infrastructure that serves multiple properties and provides regional drainage benefits. These typically include trunk sewers, roadside ditches, and some stormwater management facilities. Public maintenance ensures consistency, reliability, and compliance with regulatory requirements such as MS4 permits, flood control, and water quality protection.

Private stormwater systems include onsite management facilities, small conveyance systems, and localized ditches or swales. These systems are intended to manage stormwater generated within a property or subdivision. While private owners are responsible for day-to-day upkeep, public oversight and inspection help ensure facilities function as designed and meet long-term performance goals. As part of the City's MS4 permit compliance, public oversight is required for onsite management facilities through the development of Operation and Maintenance (O&M) agreements between the City and the property owner. Ongoing inspections of these facilities are required both by the O&M agreements as well as the Ohio EPA MS4 Permit.

The City should take a phased approach to ensure that all stormwater management facilities have an O&M agreement in place and that ongoing inspections are conducted:

1. Voluntary Participation
   The City should begin by offering simplified maintenance agreements to owners of older SCMs, supported by technical guidance or incentives. These agreements provide inspection access, require routine maintenance, and allow the City to perform work if the owner does not. For shared facilities, coordination with homeowners associations, distribution of templates, and flexible compliance timelines can help build cooperation and reduce resistance.

2. Targeted Requirements
   After attempts at voluntary participation, the City should ensure all permitted SCMs have been inspected every term, as required by the MS4 permit. When deficiencies are noted, the City should issue corrective action and request that the owner address the problem. If the owner does not complete the necessary maintenance, the City can offer an O&M

agreement that allows the City to perform the work and ensure the facility is brought back into compliance. Existing development records, such as conditions of approval, covenants, drainage easements, or plan notes, may provide sufficient authority to request updated agreements for these facilities. Any redevelopment projects should be required to complete an O&M agreement covering all facilities on site if one is not currently in place.

A frequent challenge occurs between public and private infrastructure where trunk sewers or drainageways cross from public to private property without recorded easements or maintenance agreements. In these “gray areas,” responsibility is unclear, creating legal, liability, and environmental risks. The City should work toward formalizing easements, maintenance agreements, or assessment districts to resolve these issues.

Making the entire stormwater system public is likely cost-prohibitive and not in the best interest of either the City or property owners. A hybrid approach offers the most balanced solution and includes:

- Private maintenance of localized systems (onsite detention, small sewers, swales) ensures quicker response to minor issues and reduces public costs. Operation and maintenance agreements, supported by annual inspections, can provide accountability and consistency.

- Public maintenance of regional systems (trunk sewers, roadside ditches, regional detention, and natural waterways) ensures standardized maintenance, reduces downstream flooding risk, and protects public infrastructure.

Advantages of this balanced solution include:

- Property owners can respond quickly to localized issues while avoiding unnecessary public expense.
- The City provides standardized, reliable maintenance for regional systems that carry community-wide impacts.

Challenges remain, particularly for natural waterways and ditches located on private property. Barriers include limited access rights, permitting requirements, and significantly higher maintenance costs. To address these challenges, the City could:

- Utilize the ditch petition process outlined in Ohio Revised Code 6119.
- Adjust stormwater utility funding to reflect expanded responsibilities.
- Update the Stormwater Business Plan, Financial Fact Sheet and 5-Year Storm Water Utility Planning Budget accordingly.

As stormwater planning advances, the City should establish a clear responsibility framework supported by ordinances, easements, and maintenance agreements. A hybrid approach that uses private maintenance for localized facilities with City oversight, along with public maintenance of regional conveyance systems, offers the most cost-effective and sustainable strategy. This model ensures regulatory compliance, reduces flood risk, and strengthens community trust.

## 4.2 Easement Acquisition

Effective stormwater infrastructure often requires access across private parcels to inspect, maintain, and upgrade critical conveyance systems. To facilitate these improvements, the City should outline a structured process for acquiring storm sewer utility easements that balances maintenance needs with property owner rights:

1. Easement Identification
    - Review the existing stormwater system and proposed stormwater improvements to identify locations where private property access is essential.
    - Determine preliminary easement extents and dimensions based on utility type, depth, access requirements, and possible construction improvement methods.

2. Title Review & Parcel Mapping
    - Overlay proposed easements onto parcel maps and verify ownership information using County Auditor records.
    - Obtain title reports to confirm legal standing and identify existing encumbrances.

3. Property Owner Notification
    - Conduct initial outreach via mail or in-person meetings, explaining maintenance goals, proposed easement locations, and anticipated impacts.
    - Provide easement sketches and answer property owner questions about access rights, maintenance responsibilities, and compensation.

4. Appraisal & Compensation (if applicable)
    - For permanent easements with measurable impact on property value, the City may engage certified appraisers to establish fair market value.
    - Negotiated compensation is documented and approved per City policy or council resolution.

5. Legal Documentation
    - Draft easement agreements in coordination with the City's legal counsel.
    - Documents define scope (e.g., drainage, access, utility), term (permanent or temporary), and conditions (restoration, compensation).
    - When appropriate, use basic exhibits that show easements over an aerial image with a short narrative description to clearly illustrate the conditions of the easement.

6. Execution & Recording
    - Property owners sign easement agreements voluntarily or, when necessary, through negotiated settlement.
    - Executed documents are recorded with the County Recorder's Office and archived in the City's GIS system for future reference.

Standardized easement language and a clear exhibit can benefit City staff working with property owners to obtain access to repair, maintain or install new infrastructure. Coordination with the Law Director's office will be important to provide easement language that is consistent with the intent of the project. Sample easement language is attached as Appendix G.

## 4.3 Improved Mapping

Up-to-date mapping of City storm sewer infrastructure is essential for effective stormwater management, long-term capital planning, and regulatory compliance. While past efforts have relied heavily on as-built drawings and limited field verification, the resulting GIS datasets are fragmented, outdated, and lack the detailed attributes necessary for hydraulic modeling, maintenance scheduling, and emergency response coordination.

To address these limitations, a comprehensive GIS improvement initiative has been launched. The City has contracted with Great Lakes Community Action Partnership (GLCAP) to gather GPS data of all known storm sewer system assets. GPS data will be further reviewed and coordinated with existing as-built drawings, CAD files and other pertinent records. Additional field investigation can further confirm the data. GLCAP will develop GIS files of the City's storm sewer system using ESRI based products. The City's future GIS system should be expected to be a continuous work in progress. Model systems should strive to incorporate the following key elements:

- Development of a standardized, spatially accurate GIS database that consolidates both legacy records and newly collected field data into a centralized geodatabase.
- Field verification to locate key infrastructure components such as manholes, catch basins, inlets, outfalls, and underground piping.
- Physical and condition attributes including material type, pipe diameter, and installation year.
- CCTV footage and field observations to cross-verify existing records and help reconcile discrepancies and fill data gaps.

GLCAP will host this data and set up web-based and mobile applications. However, to maintain the integrity of the system over time, standard operating procedures (SOPs) should be developed for future data updates. City staff should be trained in data entry workflows and quality assurance routines. Integration with computerized maintenance management systems (CMMS) should be explored to enable real-time updates and predictive maintenance capabilities.

With improved situational awareness of stormwater infrastructure, the City can be better equipped to conduct hydraulic and hydrologic modeling, respond to emergencies, and plan maintenance activities with precision. The upgraded GIS system will also support compliance with MS4 and FEMA reporting requirements and lay the groundwork for future smart infrastructure applications, including sensor-based monitoring and automated data collection.

## 4.4 Continued/Enhanced Partnerships

Stormwater management in the City of Oberlin is inherently regional, shaped by the movement of water across municipal boundaries and the shared responsibility for protecting downstream properties and systems. Ongoing collaboration with the Lorain County Storm Water Management District (LCSWMD) and neighboring townships is not just beneficial, it's essential. These partnerships play a critical role in managing both the inflow of stormwater from surrounding jurisdictions into Oberlin's Municipal Separate Storm Sewer System (MS4), and the outflow of stormwater into township/county managed infrastructure.

The City of Oberlin and the LCSWMD have developed a partnership over the past decade focused on MS4 Compliance. The City is currently a co-permittee with the LCSWMD on the MS4 permit. This partnership has been mutually beneficial for each entity and it is recommended that the partnership be strengthened and enhanced to include partnering on projects that impact both the City and County/Townships. The hydrologic connections between Oberlin and its neighbors are complex. Tributaries and conveyance systems originating outside the City often discharge into Oberlin's MS4, while portions of the City's own stormwater network ultimately flow downstream into county systems. This interdependence lends itself to a coordinated approach to planning, monitoring, maintenance and improvement.

To strengthen these relationships, the City should formalize shared responsibilities and improve communication with its regional partners. This includes aligning infrastructure upgrades across jurisdictional boundaries, coordinating discharge monitoring and reporting to meet MS4 permit requirements, and establishing clear protocols for managing cross-boundary flows. Collaborative efforts should also extend to capital improvement planning, where joint projects could yield greater regional benefits. Data sharing initiatives, such as GIS mapping and hydraulic modeling, can help support unified planning and emergency response.

## 4.5 NPDES Permit (MS4)

The City operates as a regulated Municipal Separate Storm Sewer System (MS4) under the National Pollutant Discharge Elimination System (NPDES) program, administered by the U.S. EPA and in turn by the Ohio EPA. Currently, the City is a co-permittee of the LCSWMD. Compliance with the MS4 General Permit is critical to ensure that stormwater discharges do not impair water quality or violate regulatory standards. Generally, the MS4 permit is renewed once every five years with the next permit update scheduled to occur in April of 2026. Historically, each permit renewal has come with increased regulation and associated cost to maintain compliance. The City should review the draft permit with LCSWMD to determine the best ways to meet existing and future regulatory requirements.

## 4.6 Ordinance Updates

To ensure lasting compliance with its National Pollutant Discharge Elimination System (NPDES) permit and to streamline the efficiency of the stormwater program, stormwater related ordinances should be reviewed and updated at least once every five years. This correlates with updates to the MS4 permit as well as the Ohio EPA Stormwater Construction General Permit. The MS4 permit requires the following minimum regulations:

- Comprehensive Stormwater Management.
- Erosion and Sediment Control.
- Illicit Discharge Detection and Elimination.

Currently, the City's stormwater regulations are contained within Chapter 916 of the codified ordinances and were last updated in 2019. More comprehensive local regulation to meet Illicit Discharge Detection and Elimination requirements is likely necessary.

There are numerous model stormwater regulations that have been developed by the Chagrin River Watershed Partners which include the three regulations listed above as well as regulations for Watershed Protection. It is recommended that these model regulations be compared with current Oberlin regulations.

## 5. Stormwater Business Plan

The City of Oberlin's stormwater business plan serves as a strategic framework for funding, managing, and sustaining stormwater infrastructure and services. Last updated in March 2018, the plan outlines financial mechanisms, organizational responsibilities, and regulatory commitments that support long-term system performance and community resilience.

To remain effective and responsive to changing conditions, the business plan, the financial fact sheet and the 5-year stormwater utility planning budget should be revisited every five years. A scheduled update will allow the City to recalibrate its financial model, evaluate service levels, and incorporate new regulatory requirements, technological advancements, and community priorities.

The current financial model is based on an Equivalent Residential Unit (ERU) rate structure, which equitably distributes stormwater service costs based on impervious (hard) surface area. The City established the ERU rate structure by Ordinance 18-34. This set the ERU rate at $4.25/ERU/month in 2019 with rates increasing incrementally year over year for the initial 5-year planning period. The 2023 ERU rate of $6.61/ERU/month will remain in effect until adjusted by Oberlin City Council.

While the ERU rate has supported core operations and capital improvements, a comprehensive review is recommended to assess its adequacy in light of inflation, expanded maintenance needs, and future capital investments. This review should include:

- Cost projections for MS4 permit compliance and flood mitigation.
- Funding needs for GIS modernization and asset management.
- Funding needs for capital improvements.
- Reserve targets for emergency response and system rehabilitation.
- Rate benchmarking against peer communities.

To ensure continued alignment with regulatory mandates and community expectations, the City should initiate a business plan update in fiscal year 2026 or as soon thereafter as is feasible, with stakeholder engagement, financial modeling, and ERU rate analysis as core components. This update will reinforce transparency, support capital planning, and position Oberlin to meet future stormwater challenges.

## 5.1 Loan/grant opportunities

The City of Oberlin benefits from a unique position within the Lorain County Stormwater Management District, which provides access to regional funding, technical support, and cost-sharing opportunities. This partnership, along with a range of state and regional funding programs are available to help finance infrastructure upgrades, water quality improvements, and innovative green practices. Below is a summary of key programs:

### 5.1.1 Lorain County Stormwater Management District (LCSWMD)

Oberlin is a partner in the District, which offers Community Grants and Mini Grants to support local stormwater improvements. While Oberlin is not directly able to submit for Community and Mini grants, by partnering with neighboring townships, these funds could be leveraged to support projects that benefit the City. These funds can be used for:

- Infrastructure upgrades to reduce flooding and pollution
- Stormwater system repairs and replacements
- Water quality monitoring and pollutant control
- Public education and outreach initiatives

The District also coordinates capital planning and regulatory compliance, helping Oberlin meet MS4 Phase II permit requirements efficiently and is able to support other state or national grant opportunities that could benefit the City.

### 5.1.2 Ohio Water Development Authority (OWDA)

Oberlin may apply for low-interest loans through OWDA programs that support stormwater infrastructure:

- Water Pollution Control Loan Fund (WPCLF): For planning and construction of stormwater and wastewater projects
- Onsite Stormwater Loan Program: Ideal for decentralized solutions like bioswales, permeable pavement, and rain gardens
- Community Assistance Loan Program: Available to financially distressed communities for essential water infrastructure

These programs offer flexible terms and are well-suited for both large-scale and neighborhood-level improvements.

### 5.1.3 H2Ohio Programs

Where applicable, Oberlin could collaborate with Lorain County agencies to access H2Ohio funding streams:

- Conservation Ditch Program: Supports construction of two-stage and self-forming ditches; open to County Engineers and Soil & Water Conservation Districts.
- Wetland Grant Program: Funds stream restoration, wetland enhancement, and detention basins with water quality benefits. Projects must demonstrate nutrient reduction and have a minimum 15-year useful life.

These grants are especially valuable for projects within the Black River Watershed which drains into Lake Erie and includes Oberlin.

### 5.1.4 Ohio EPA Section 319(h) Nonpoint Source Grant Program

Through the Section 319(h) Nonpoint Source Grant Program, Ohio EPA provides federal funding for:

- Stormwater best management practices (BMPs) such as bioretention, permeable pavement, and green infrastructure.
- Streambank stabilization, riparian buffer restoration, and erosion control.
- Watershed planning and public education to reduce nonpoint source pollution.

The City can apply directly or collaborate with Lorain County to pursue projects that align with an approved 9-Element Nonpoint Source Implementation Strategy (NPS-IS). Since the Headwaters West Branch Black River watershed does not yet have an approved plan, the City would need to develop its own NPS-IS, before becoming eligible for Section 319 funding, which adds an additional step to securing these grants. Matching funds (typically 40%) are required, and proposals must demonstrate measurable water quality improvements.

### 5.1.5 Ohio Public Works Commission (OPWC)

Through the State Capital Improvement Program (SCIP) and Local Transportation Improvement Program (LTIP), OPWC provides grants and loans for:

- Stormwater and drainage infrastructure.
- Erosion control and flood mitigation.
- Roadway improvements with integrated stormwater components.

OPWC District 9 (Lorain, Medina & Huron counties) prioritizes roadway, bridge and culvert improvement projects. Oberlin has incorporated drainage systems into its roadway improvement applications for many years. The City should continue to access OPWC funds. Certain regional projects could be financed by OPWC in partnership with Lorain County and the adjoining townships.

### 5.1.6 Northeast Ohio Regional Sewer District (NEORSD)

While Oberlin is outside NEORSD's combined sewer area, regional collaboration may allow access to:

- Green Infrastructure Grants.
- Watershed Service Agreements.

These programs support runoff reduction, stream restoration, and water quality improvements—especially when projects benefit shared watersheds.

# 6. Recommendations

To move forward efficiently, the City should take a phased approach that emphasizes prioritized risk reduction and long-term system resilience.

## 6.1 Short-Term Goals (0–2 Years)

Focus: Foundational data, priority inspections, and initial coordination.

Infrastructure Inventory & Assessment

- Develop a standardized GIS database consolidating legacy records and new field data.
- Conduct field verification and CCTV inspections to locate and assess key components.
- Capture physical and condition attributes (e.g., pipe material, diameter, installation year).
- Initiate development of a capital improvement program using inventory data to prioritize repairs, replacements, and upgrades based on condition, risk, and service needs. The CIP will need to be integrated with the City's other infrastructure planning processes, especially streets and sanitary sewer collection system projects.

Maintenance & Field Operations

- Prioritize inspections and repairs in high-risk and flood-prone areas.
- Ensure all private facilities that have an Operation and Maintenance (O&M) agreement are inspected regularly.
- Begin offering simplified maintenance agreements to owners of older SCMs. Provide technical guidance or incentives to encourage participation.

Easement Strategy & Acquisition

- Identify infrastructure segments requiring access across private property.
- Review legal records and title reports to locate existing easements and ownership details.
- Engage property owners early with clear communication and sketches; provide compensation when appropriate.

Policy, Ordinance & Funding Updates

- Review and update stormwater ordinances to align with MS4 and Ohio EPA requirements.
- Begin stakeholder engagement for updates to the Stormwater Business Plan, the Financial Fact Sheet and the 5-Year Stormwater Utility Planning budget.

Regional Partnerships

- Strengthen collaboration with LCSWMD and neighboring jurisdictions.
- Implement data-sharing initiatives (e.g., GIS, hydraulic modeling) to support unified planning.

## 6.2 Mid-Term Goals (2–5 Years)

Focus: System calibration, routine operations, and formal agreements.

Infrastructure Inventory & Assessment

- Establish SOPs for ongoing data updates and train staff in quality assurance.
- Use improved data to support hydraulic modeling and smart infrastructure applications.
- Finalize a capital improvement program using collected data to prioritize improvement plans and integrate them with other capital projects where applicable.

Maintenance & Field Operations

- Establish routine maintenance schedules based on sediment accumulation, land use, and system performance.
- Collect flow data during storm events to calibrate hydrologic models.
- Maintain regional systems publicly while supporting private maintenance with City oversight.
- Use existing development records to support requests for updated agreements.
- Offer maintenance agreements for any SCM that fails inspection or contributes to drainage issues.

Easement Strategy & Acquisition

- Evaluate potential prescriptive easements and coordinate with legal counsel to negotiate new agreements.
- Digitally map easements in GIS and overlay with storm network to identify gaps.
- Prioritise parcel-level acquisitions based on infrastructure importance.
- Use standardized easement language and record agreements with the County.

Policy, Ordinance & Funding Updates

- Update the Stormwater Business Plan, the Financial Fact Sheet and the 5-year Stormwater Utility Planning budget.
- Reassess ERU-based financial model.
- Develop cost projections for MS4 compliance, GIS modernization, and capital improvements.
- Set emergency reserve targets and conduct rate benchmarking.

Regional Partnerships

- Formalize shared responsibilities and communication protocols for managing cross-boundary flows.
- Coordinate infrastructure upgrades, discharge monitoring, and capital planning.

## 6.3 Long-Term Goals (5+ Years)

Focus: Capital improvements, smart infrastructure, and sustained resilience.

Infrastructure Inventory & Assessment

- Integrate GIS with CMMS platforms to support predictive maintenance and emergency response.

Maintenance & Field Operations

- Formalize a storm sewer maintenance schedule.

Easement Strategy & Acquisition

- Maintain and update easement records to support long-term access and infrastructure upgrades.

Policy, Ordinance & Funding Updates

- Continue ordinance reviews on a five-year cycle.
- Update the Stormwater Business Plan, the Financial Fact Sheet and the 5-Year Stormwater Utility Planning budget on a five-year cycle. Adjust utility funding as necessary to reflect evolving responsibilities.

Regional Partnerships

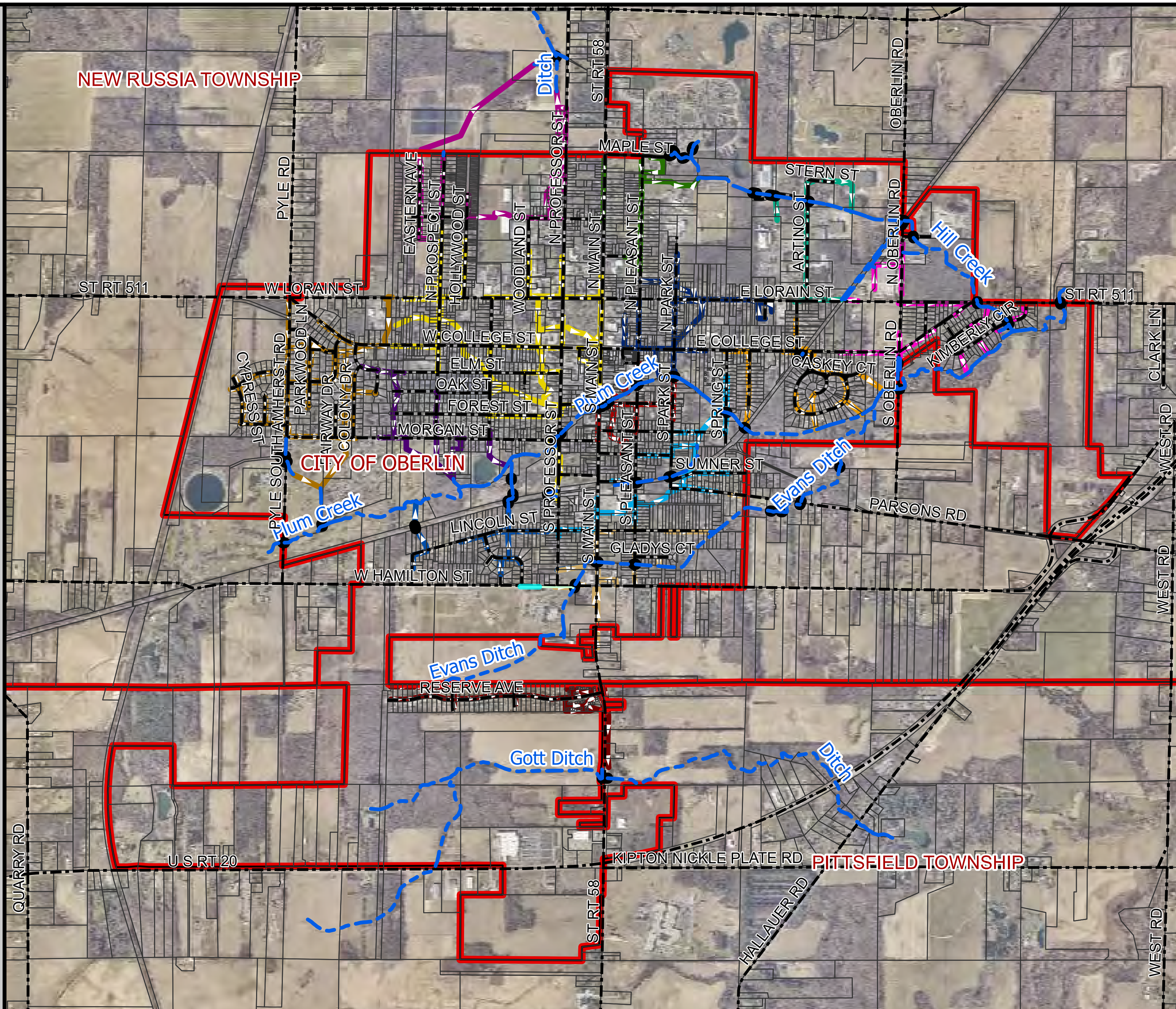
- Utilize tools like the ditch petition process (ORC 6131) for long-term access and maintenance coordination.

# Appendix A

# Study Area

## LEGEND

- Stream/Channel
- Road Centerline
- Corporation Limits
- Tax Parcel

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CITY OF OBERLIN

STORMWATER STRATEGIC PLAN

05/06/2025

OVERALL STUDY AREA

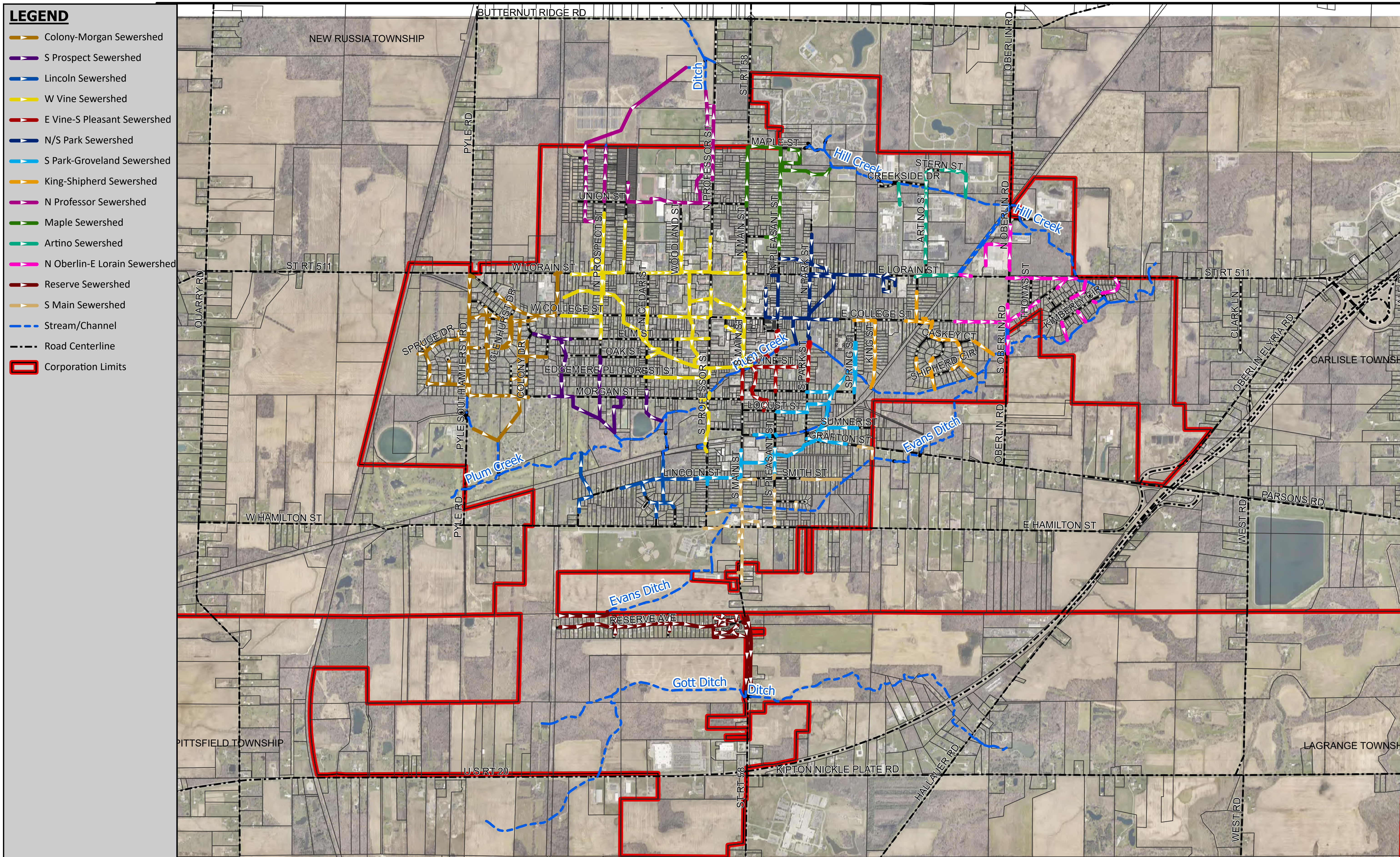
APPENDIX A

0 500 1,000 2,000 3,000
Feet

1 / 1

# Appendix B

# Overall Sewershed Map

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STORMWATER STRATEGIC PLAN

05/06/2025

CITY OF OBERLIN
OVERALL SEWERSHED MAP

APPENDIX B

0 360 720 1,440 2,160
Feet

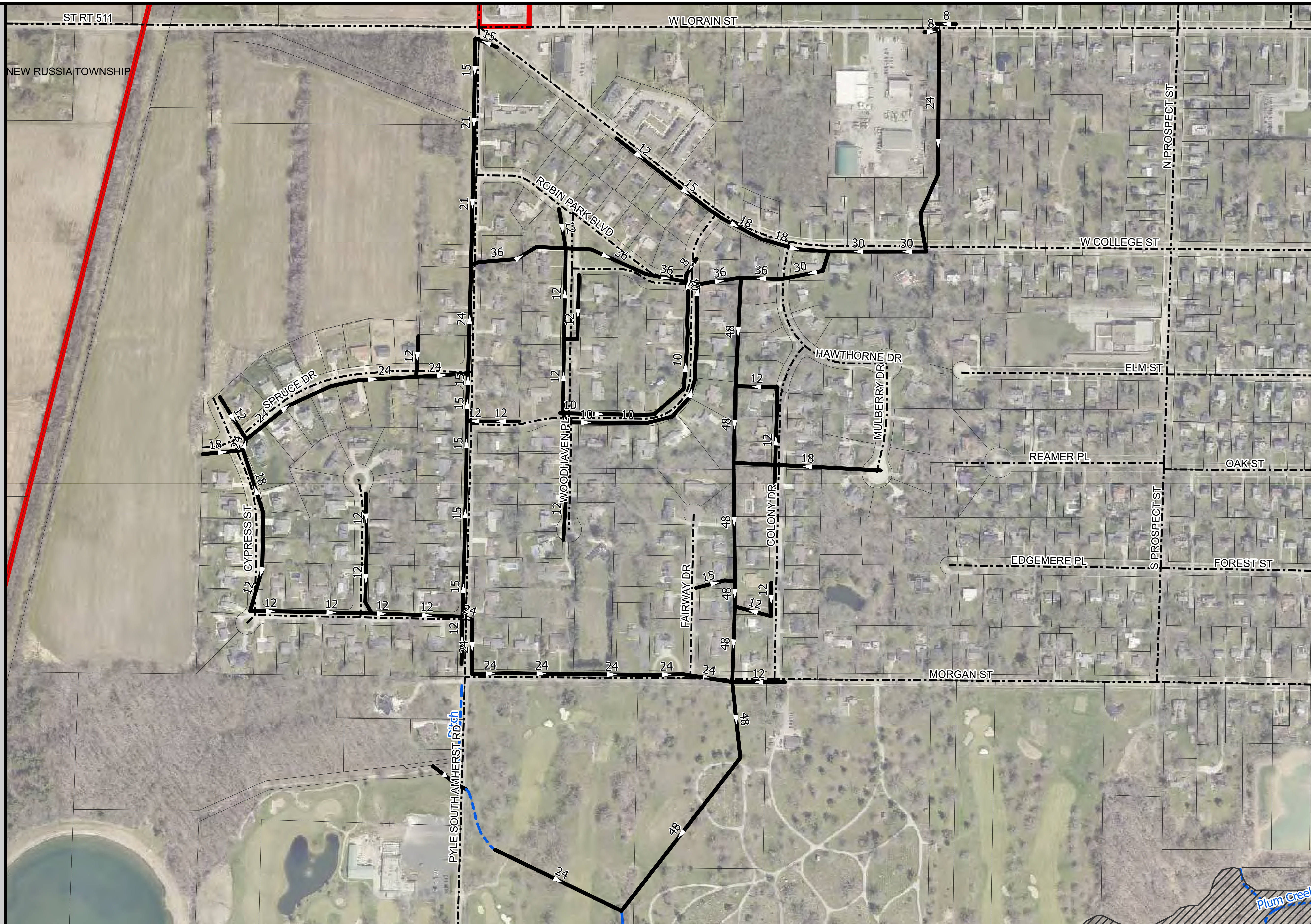
1 / 1

# Appendix C

# Sewershed Maps

**LEGEND**

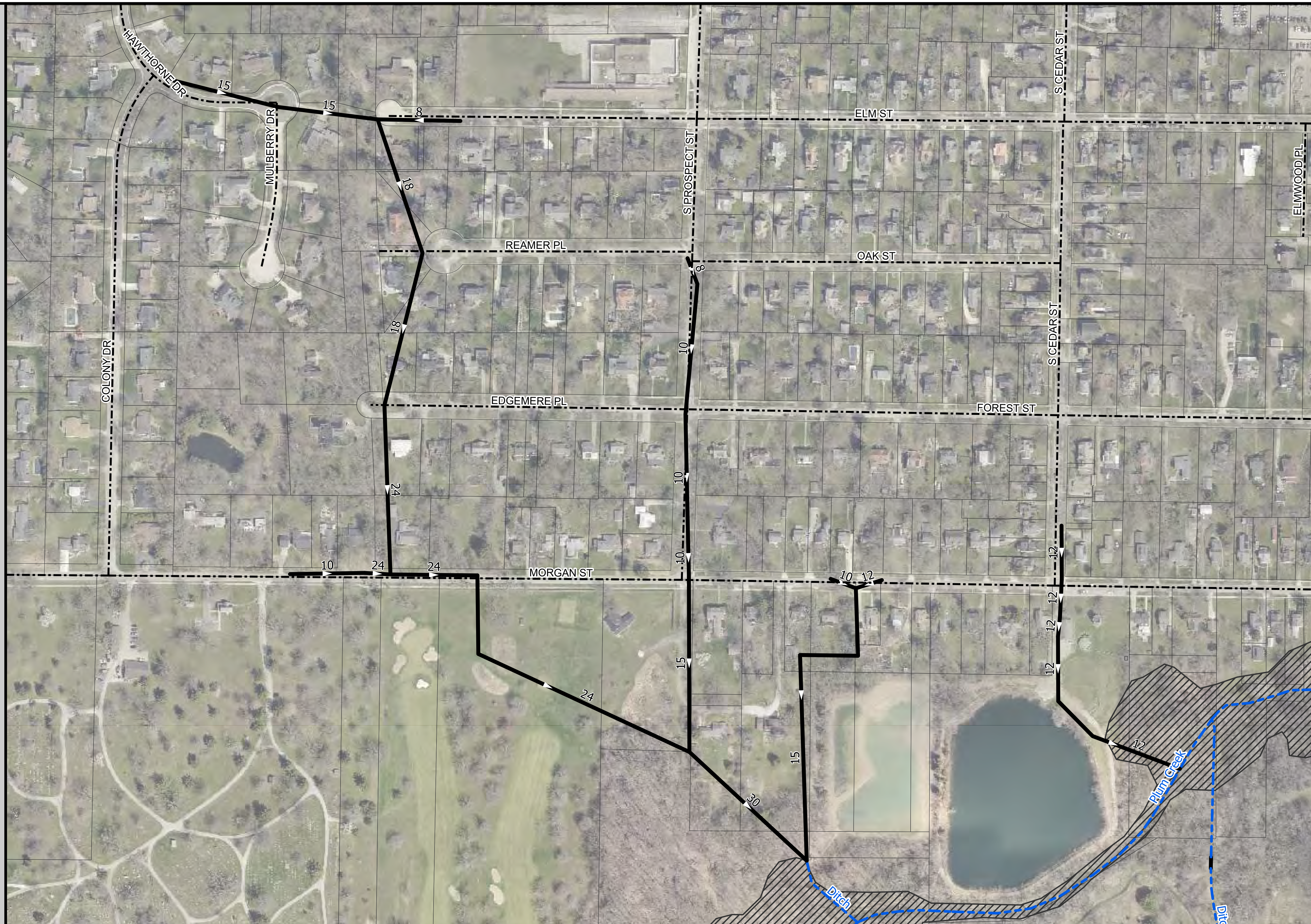
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard




| | | | | | | |
|---|---|---|---|---|---|---|
| KEM K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS | CITY OF OBERLIN | STORMWATER STRATEGIC PLAN<br>07/17/2025 | SEWERSHED MAP<br>COLONY - MORGAN | APPENDIX C | 0 75 150 300 450 Feet | 1 / 14 |

LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard




STORMWATER STRATEGIC PLAN

07/21/2025

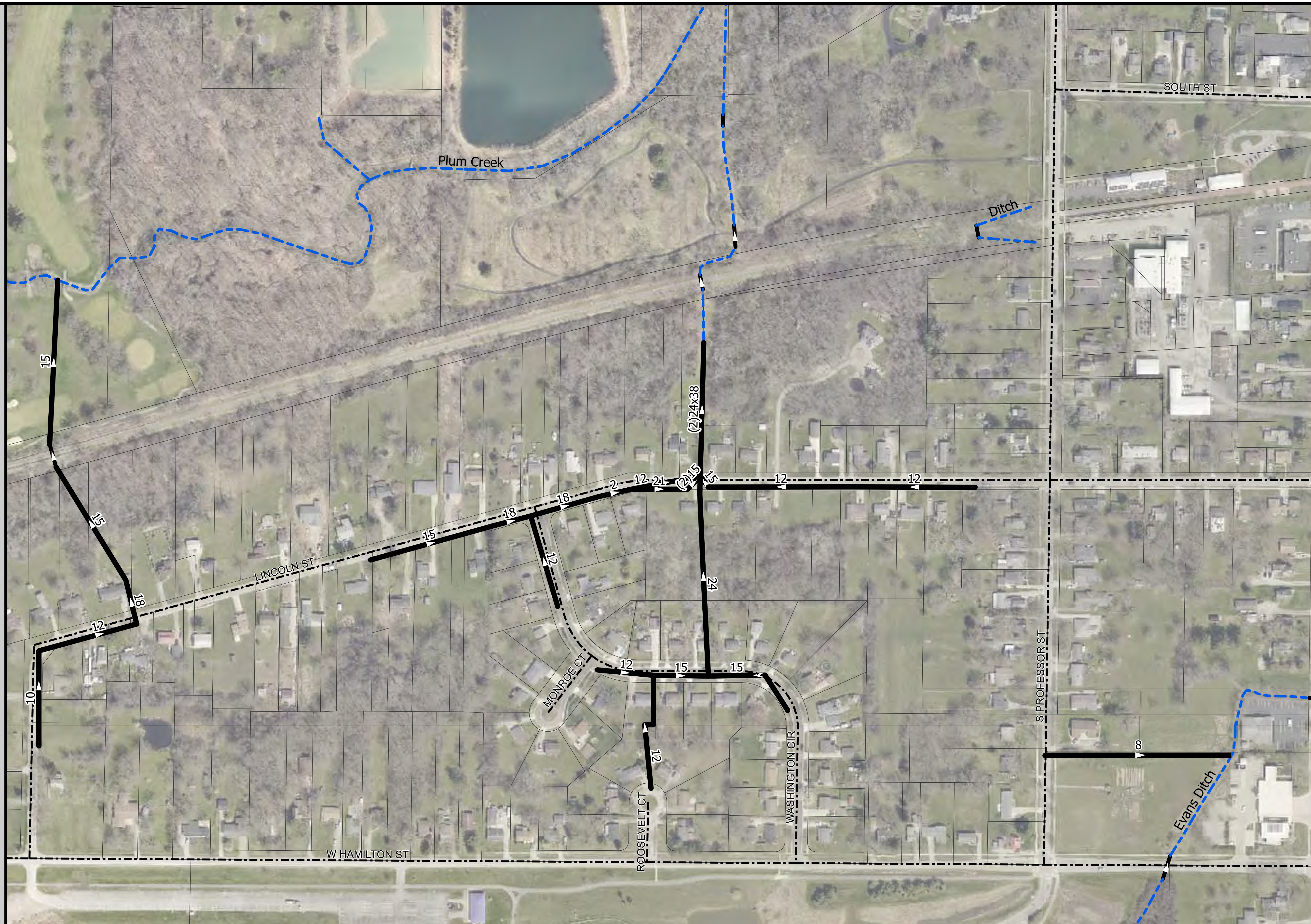
SEWERSHED MAP
SOUTH PROSPECT

APPENDIX C

0 50 100 200 300
Feet

**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard




STORMWATER STRATEGIC PLAN

07/21/2025

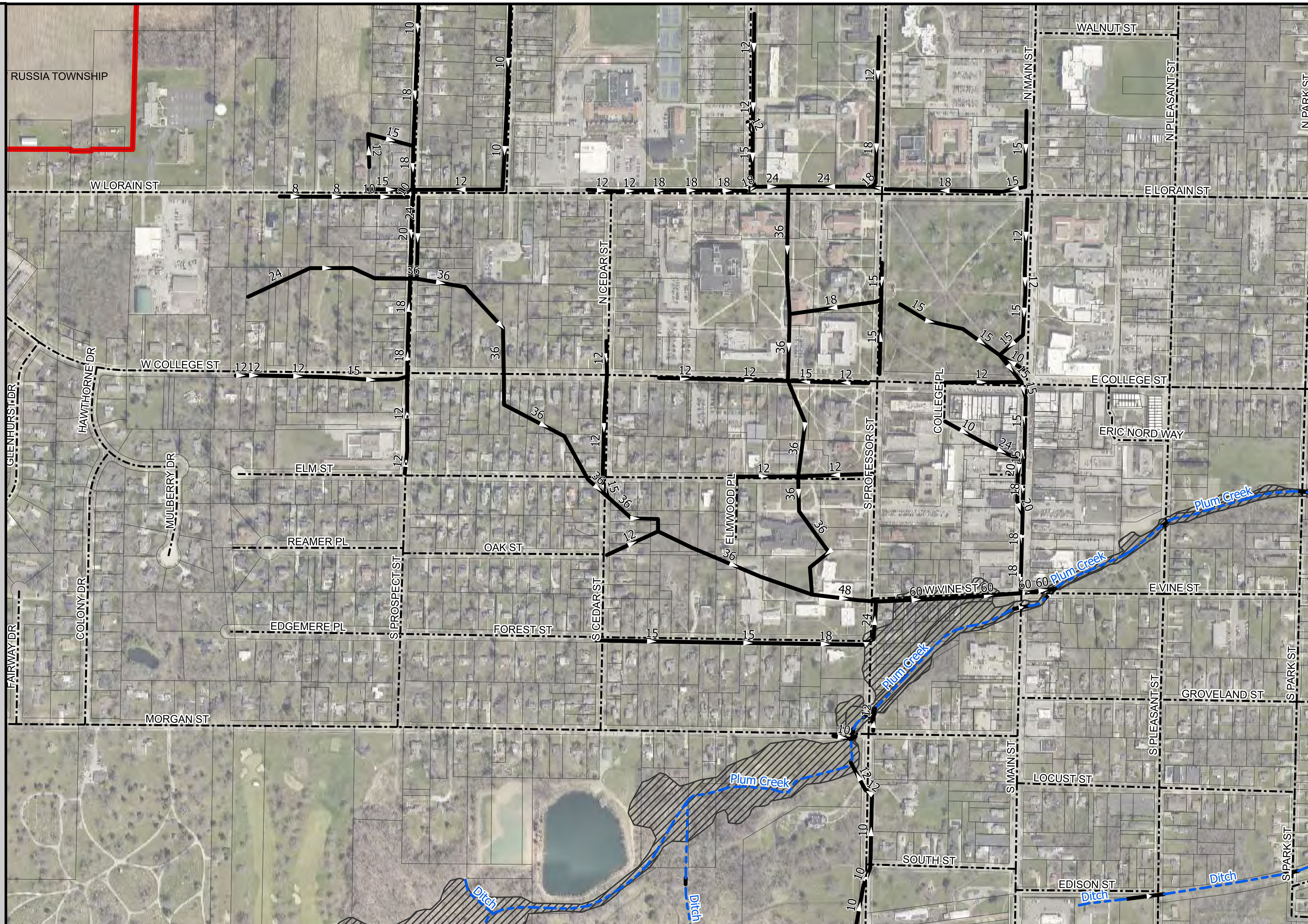
SEWERSHED MAP
LINCOLN

APPENDIX C

0 50 100 200 300
Feet

## LEGEND

| | |
|---|---|
| ## | Pipe Size (in) |
| (line symbol) | Storm Sewer |
| (line symbol) | Stream/Channel |
| (line symbol) | Road Centerline |
| (box symbol) | Tax Parcel |
| (box symbol) | Corporation Limits |
| (hatched box) | FEMA Flood Hazard |

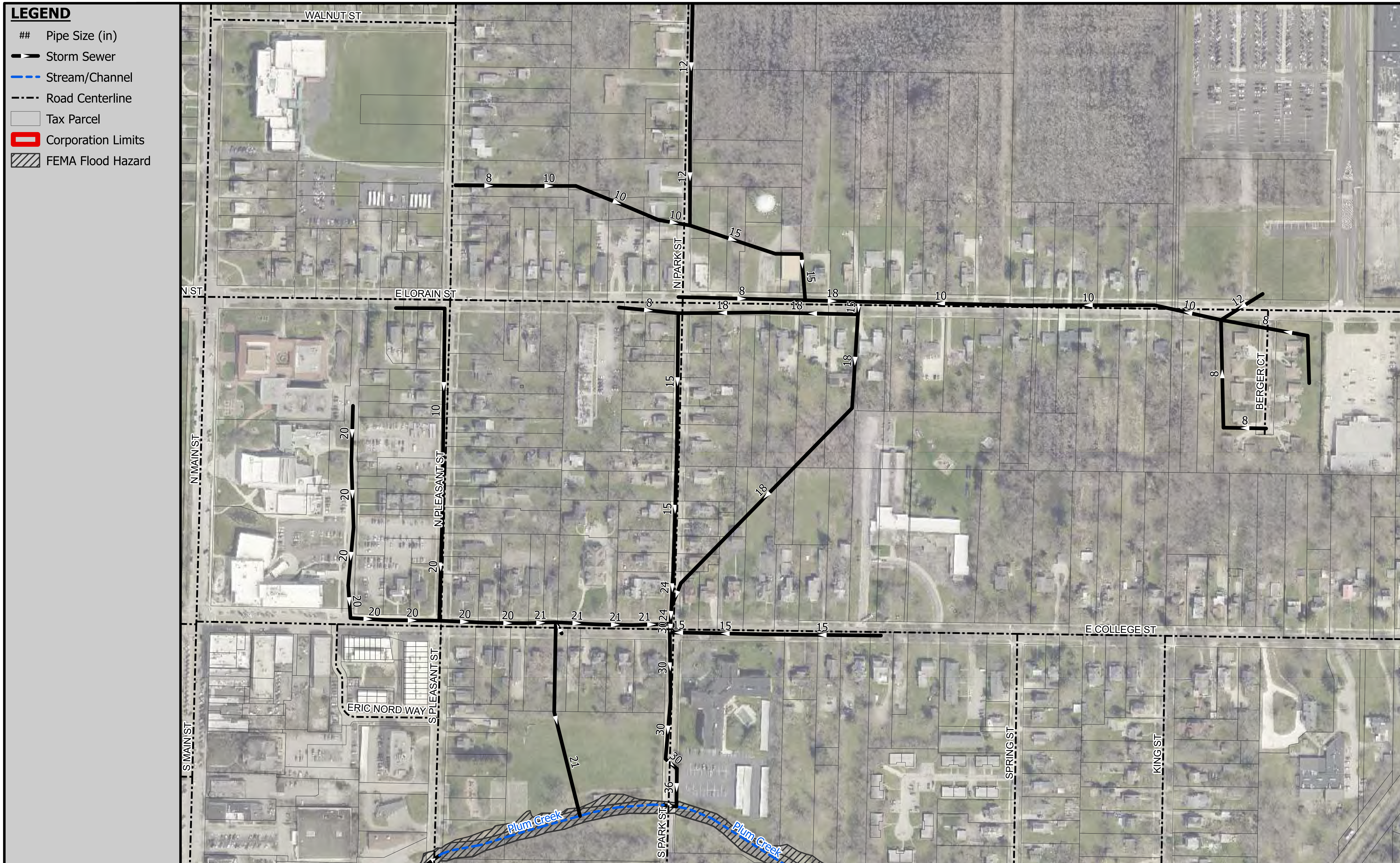



| | | | | | |
|---|---|---|---|---|---|
| K.E. McCARTNEY & ASSOCIATES — ENGINEERS • PLANNERS • SURVEYORS | STORMWATER STRATEGIC PLAN<br>07/21/2025 | SEWERSHED MAP<br>WEST VINE | APPENDIX C | 0 90 180 360 540 Feet | 4 / 14 |

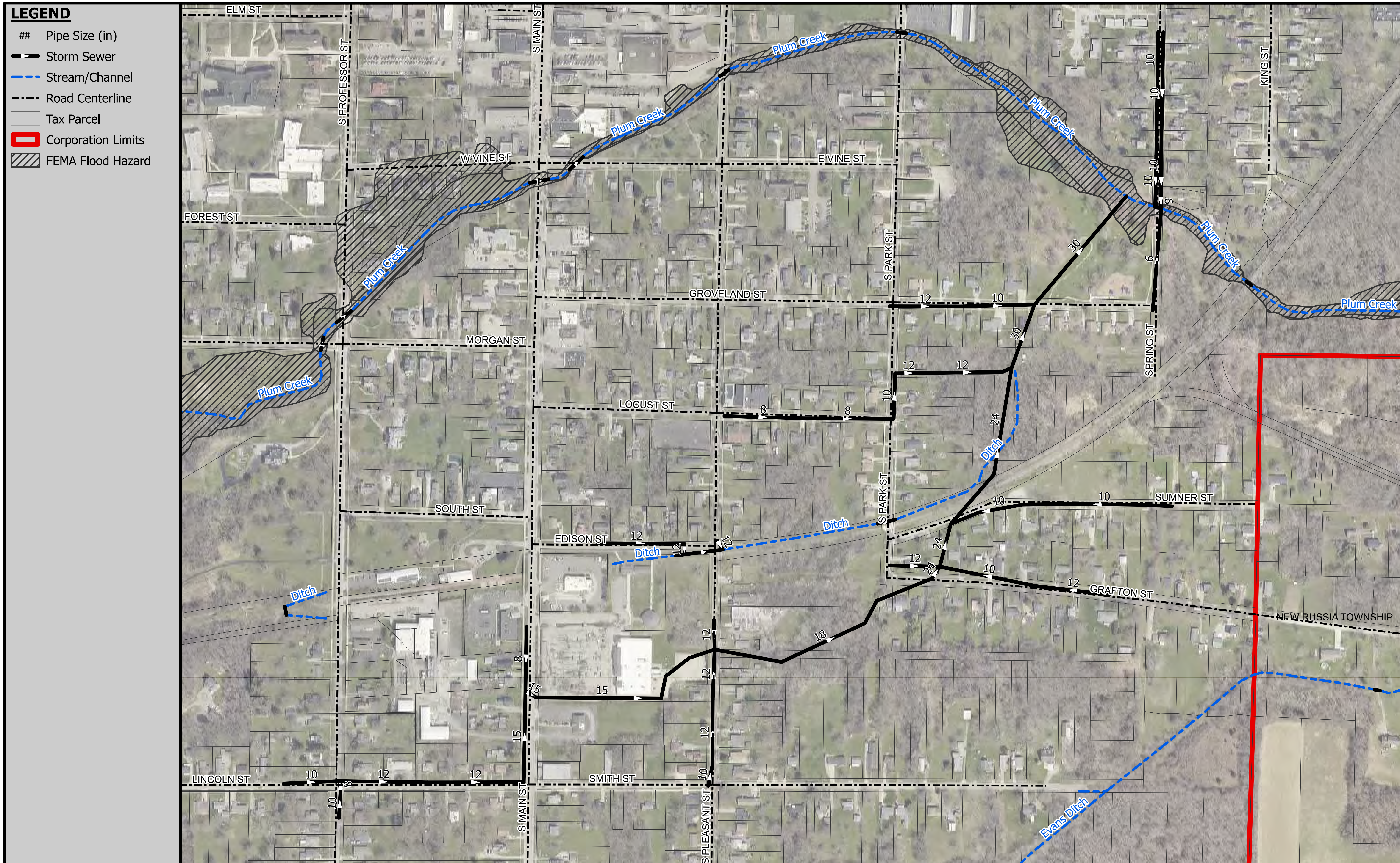
**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard


| | | | | | | |
|---|---|---|---|---|---|---|
| KEM K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS | CITY OF OBERLIN | STORMWATER STRATEGIC PLAN<br>07/21/2025 | SEWERSHED MAP<br>EAST VINE - SOUTH PLEASANT | APPENDIX C | 0 45 90 180 270 Feet | 5 / 14 |




| KEM K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS | CITY OF OBERLIN | STORMWATER STRATEGIC PLAN<br>07/21/2025 | SEWERSHED MAP<br>N PARK - S PARK | APPENDIX C | 0 50 100 200 300 Feet | 6 / 14 |
|---|---|---|---|---|---|---|



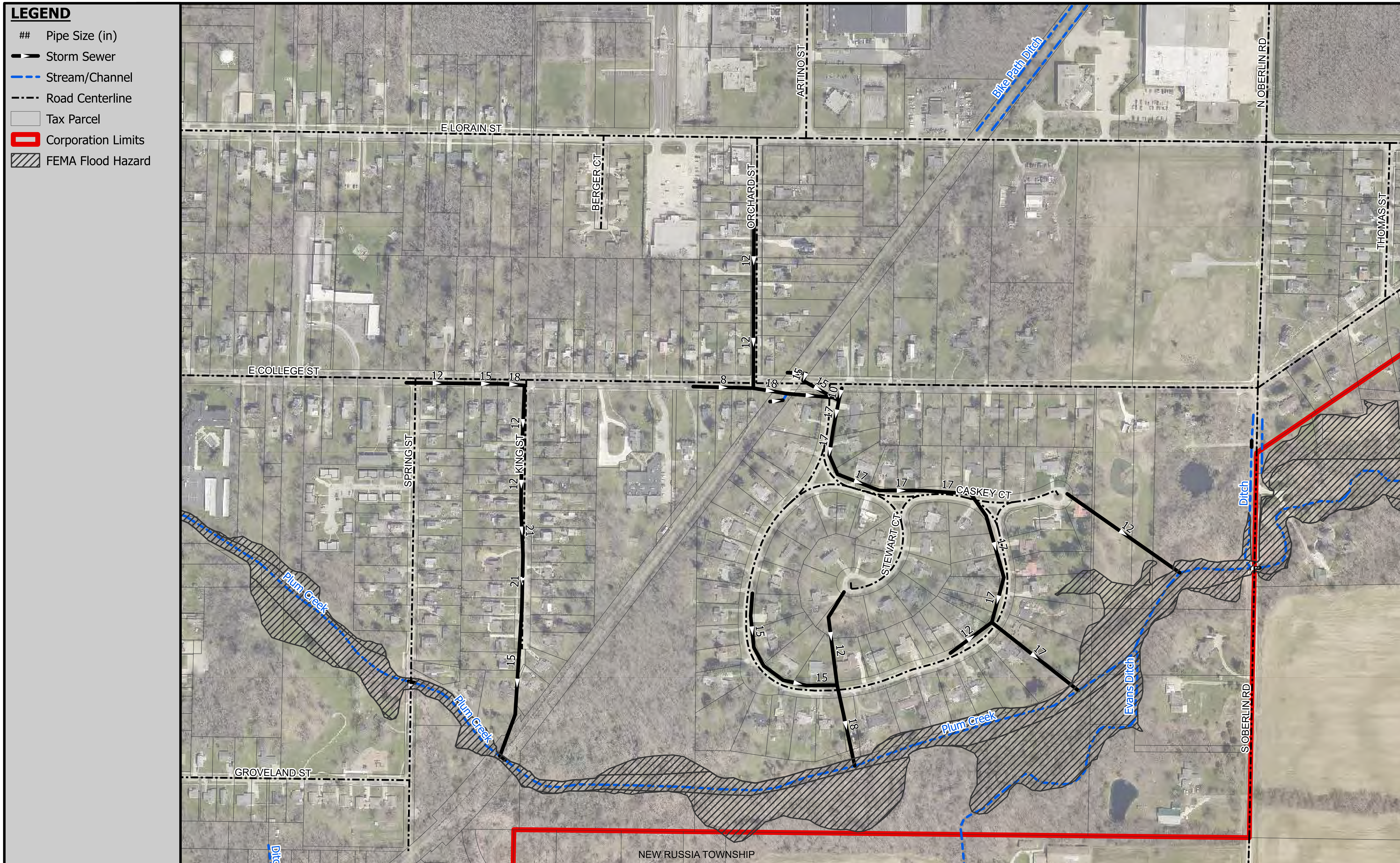

STORMWATER STRATEGIC PLAN

07/21/2025

SEWERSHED MAP
S PARK - GROVELAND

APPENDIX C

0 65 130 260 390 Feet

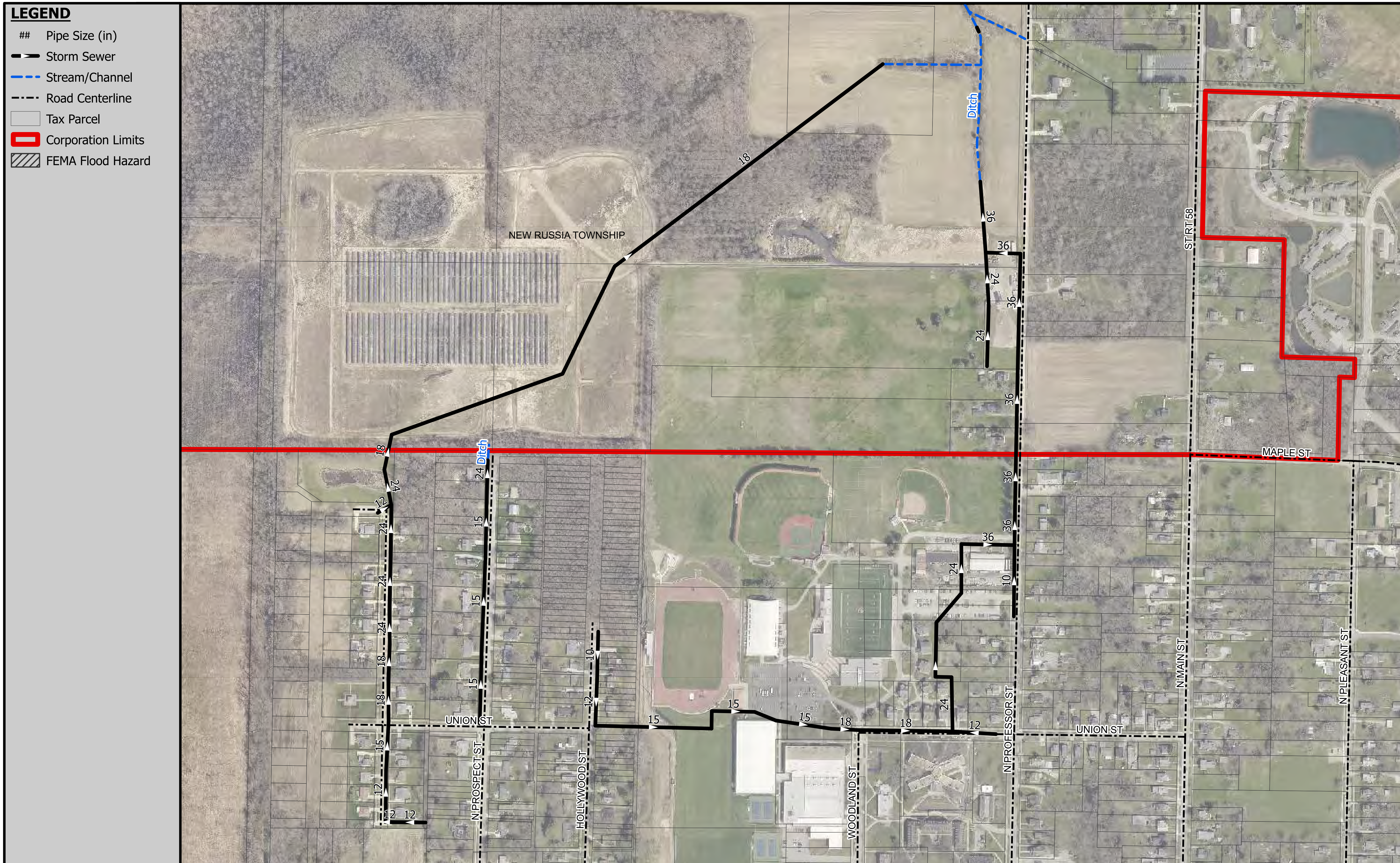


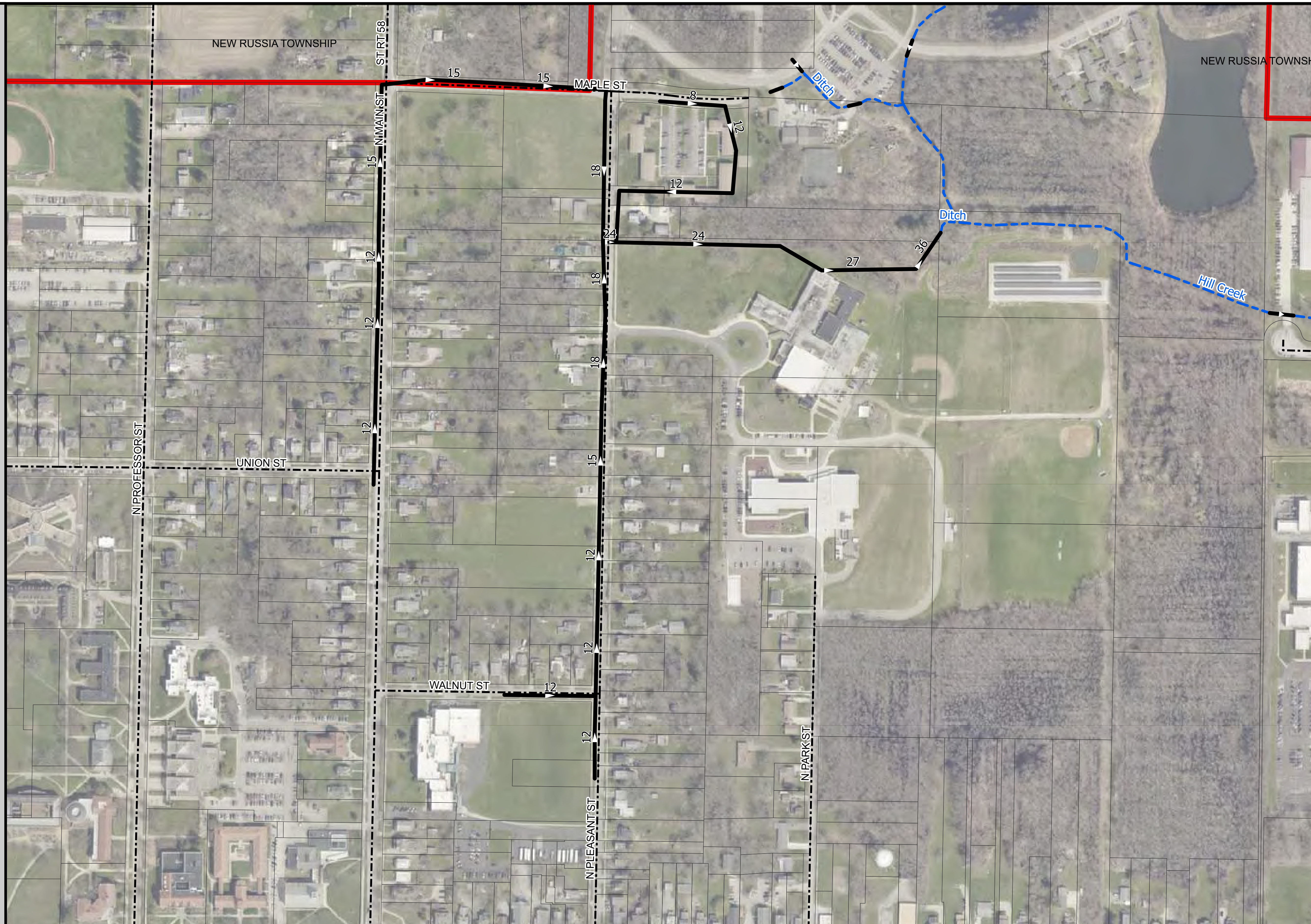

STORMWATER STRATEGIC PLAN

07/21/2025

SEWERSHED MAP
KING - SHIPHERD

APPENDIX C


LEGEND
## Pipe Size (in)
Storm Sewer
Stream/Channel
Road Centerline
Tax Parcel
Corporation Limits
FEMA Flood Hazard
NEW RUSSIA TOWNSHIP
Ditch
ST RT 58
MAPLE ST
UNION ST
N PROSPECT ST
HOLLYWOOD ST
WOODLAND ST
N PROFESSOR ST
N MAIN ST
N PLEASANT ST




**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

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CITY OF OBERLIN

STORMWATER STRATEGIC PLAN

07/22/2025

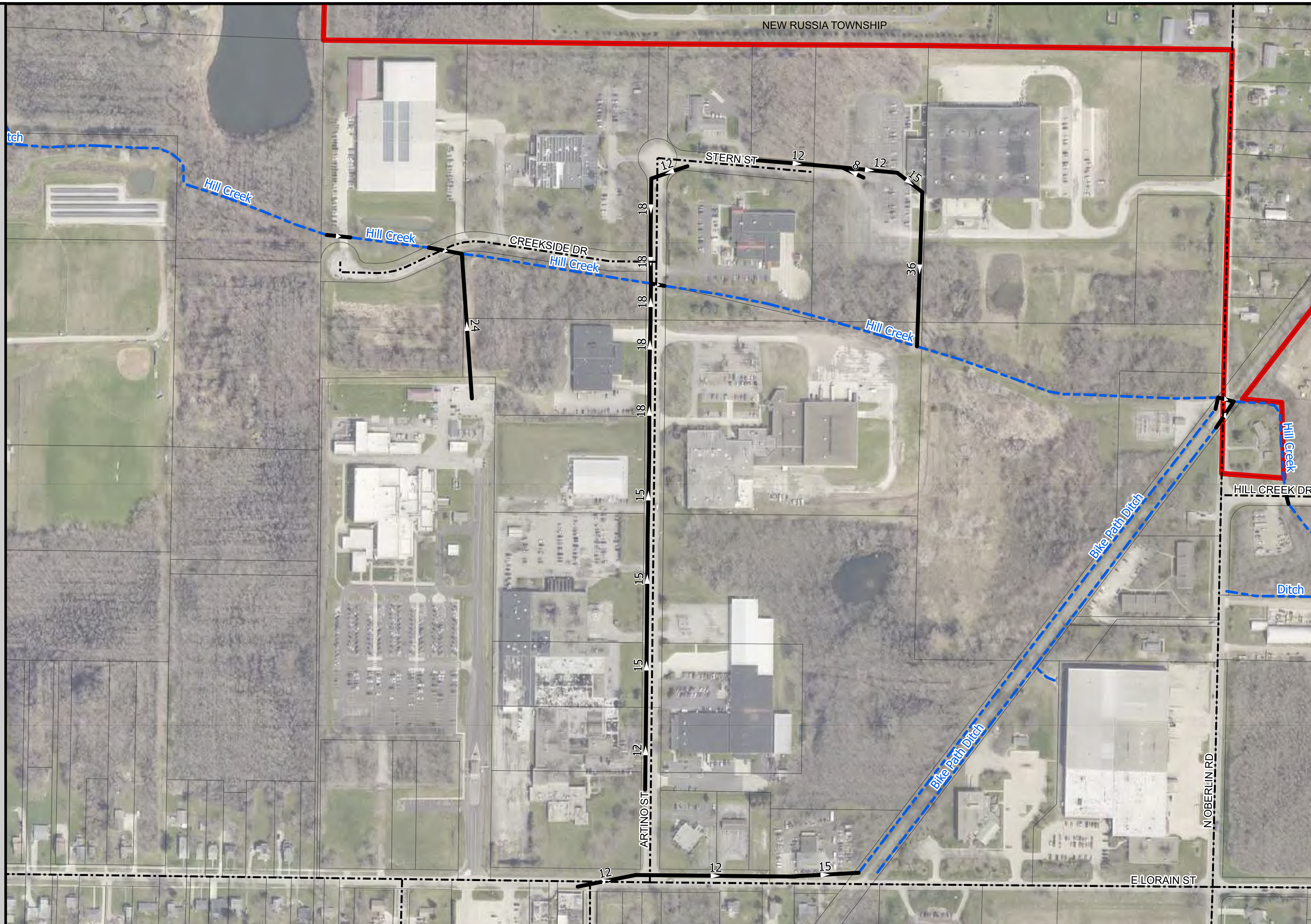
SEWERSHED MAP
MAPLE

APPENDIX C

0 55 110 220 330 Feet

**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

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CITY OF OBERLIN

STORMWATER STRATEGIC PLAN

07/22/2025

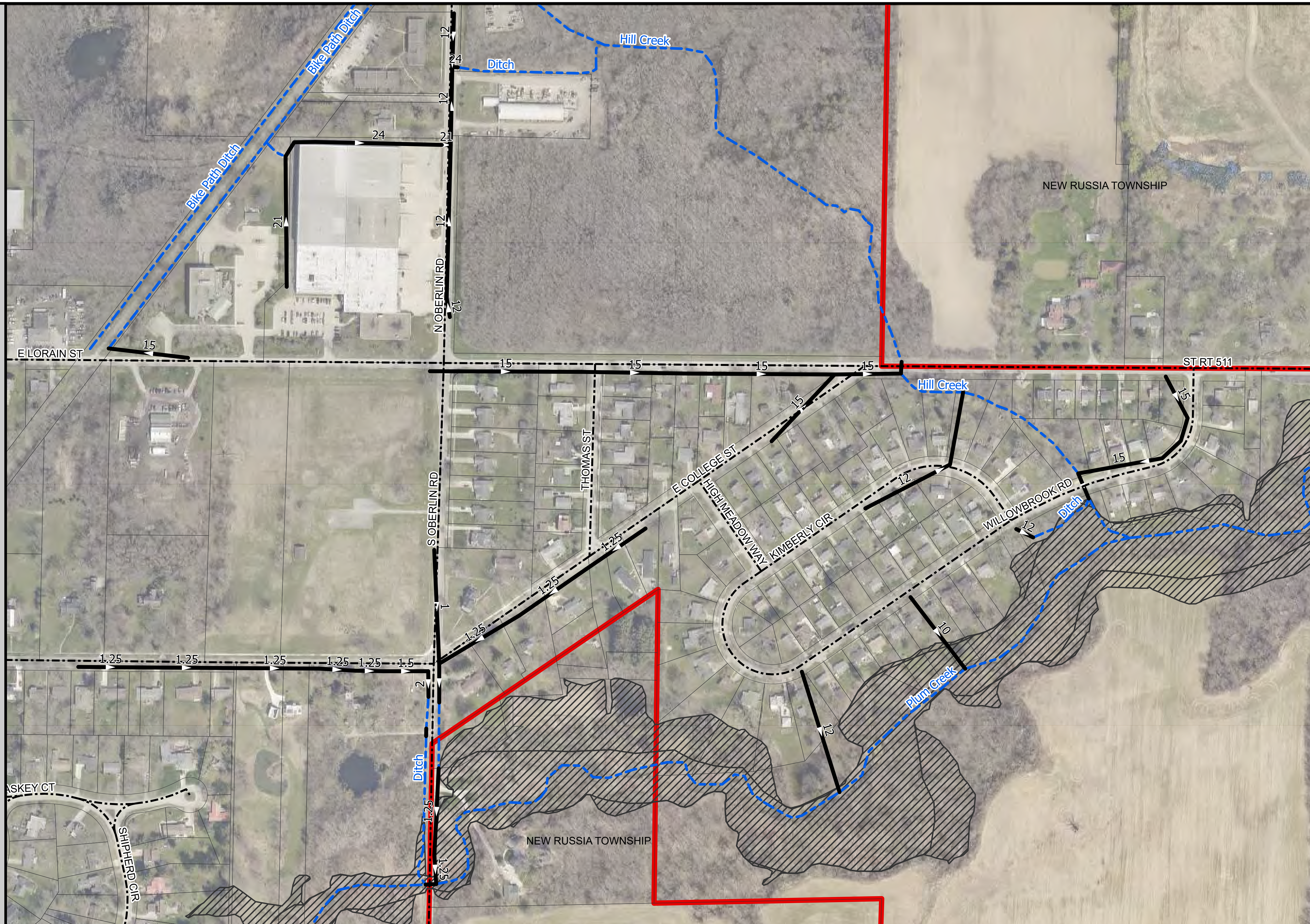
SEWERSHED MAP
ARTINO

APPENDIX C

0 55 110 220 330 Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard




STORMWATER STRATEGIC PLAN

07/22/2025

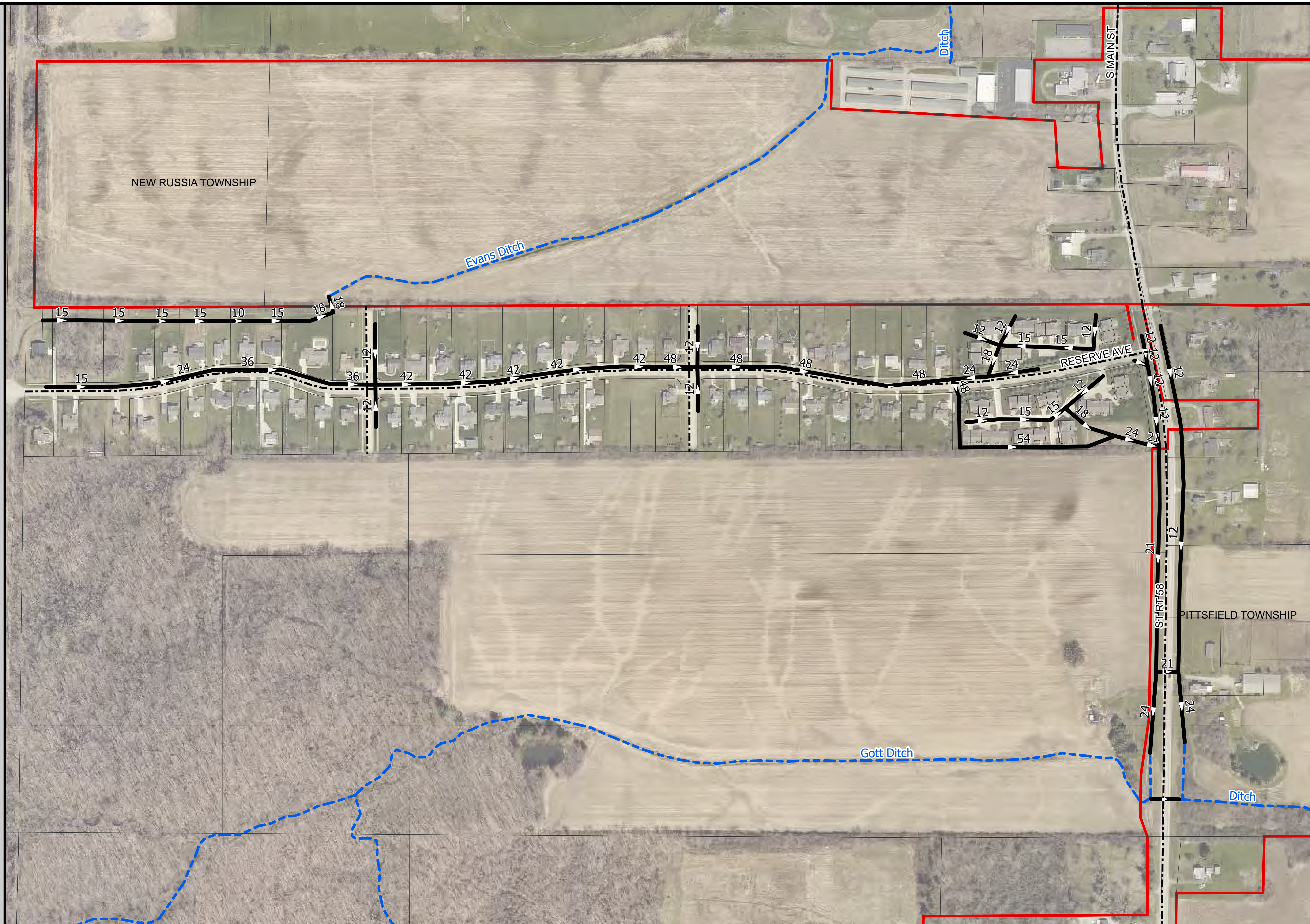
SEWERSHED MAP
N OBERLIN - E LORAIN

APPENDIX C

0 55 110 220 330 Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

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CITY OF OBERLIN

STORMWATER STRATEGIC PLAN

07/22/2025

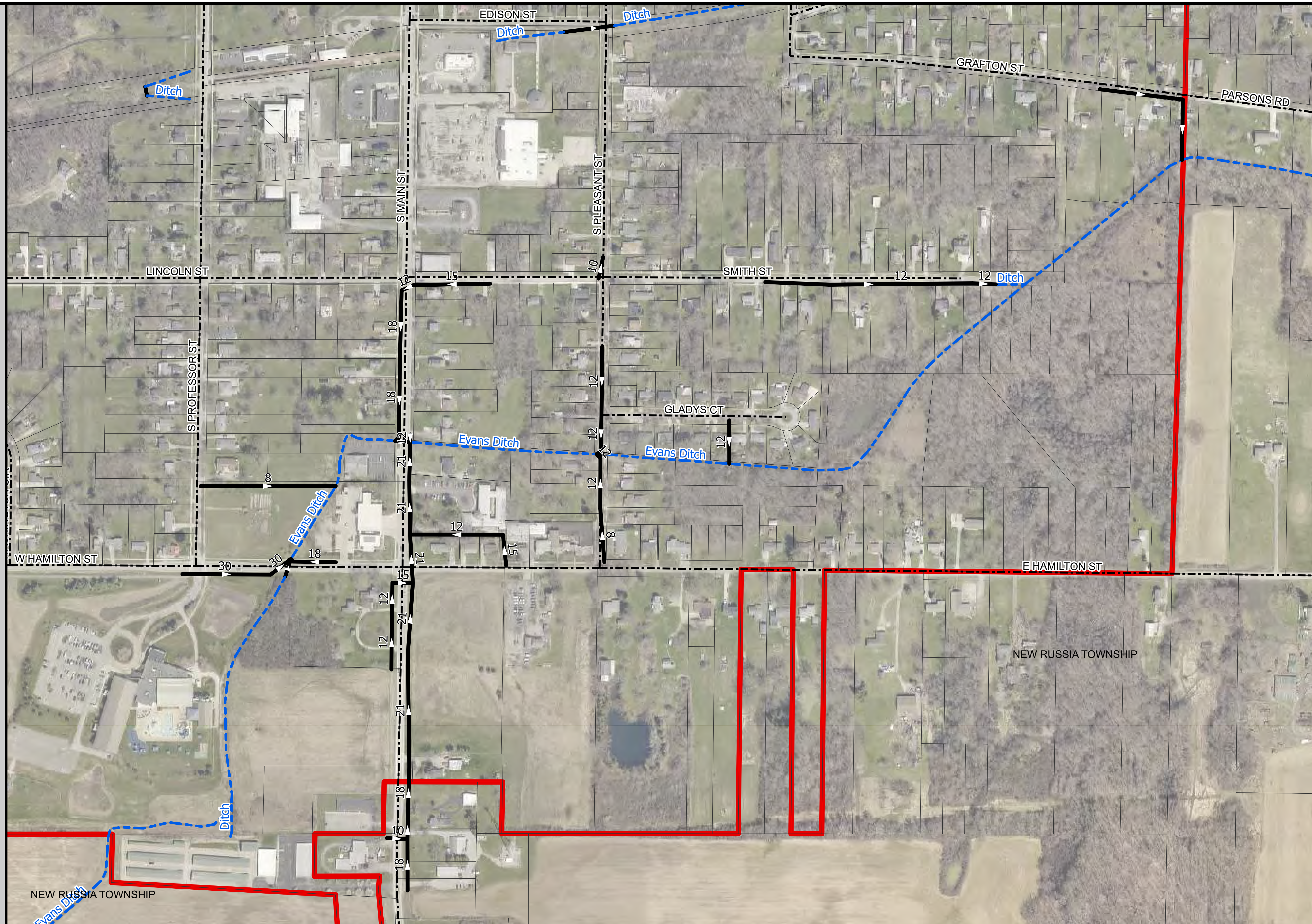
SEWERSHED MAP
RESERVE

APPENDIX C

0 65 130 260 390 Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard
- Culvert




| K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS | CITY OF OBERLIN | STORMWATER STRATEGIC PLAN<br>01/16/2026 | SEWERSHED MAP<br>S MAIN | APPENDIX C | 0 65 130 260 390 Feet | 14 / 14 |
|---|---|---|---|---|---|---|

# Appendix D-01

# 1 Year Design Storm

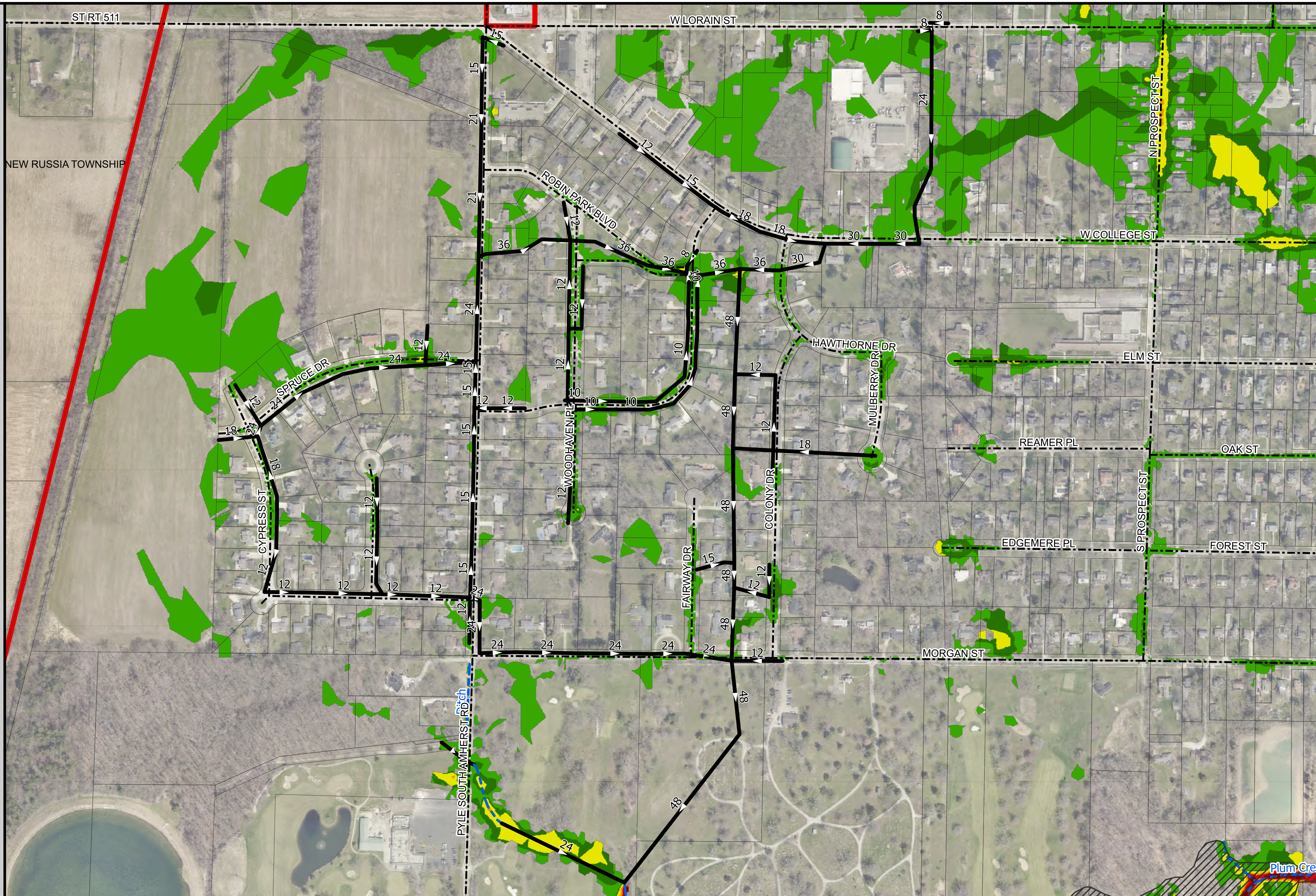
# Flood Raster Maps

## LEGEND

| | |
|---|---|
| ## | Pipe Size (in) |
| | Storm Sewer |
| | Stream/Channel |
| | Road Centerline |
| | Tax Parcel |
| | Corporation Limits |
| | FEMA Flood Hazard |

1-Yr Max Flood Depth (ft)

| | |
|---|---|
| | 0.08 - 0.49 |
| | 0.50 - 0.99 |
| | 1.00 - 1.99 |
| | 2.00 - 2.99 |
| | 3.00 - 3.99 |
| | ≥ 4.00 |




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
COLONY DRIVE - MORGAN STREET

DESIGN STORM

1-YEAR

0 75 150 300 450
Feet

1 / 14

## LEGEND

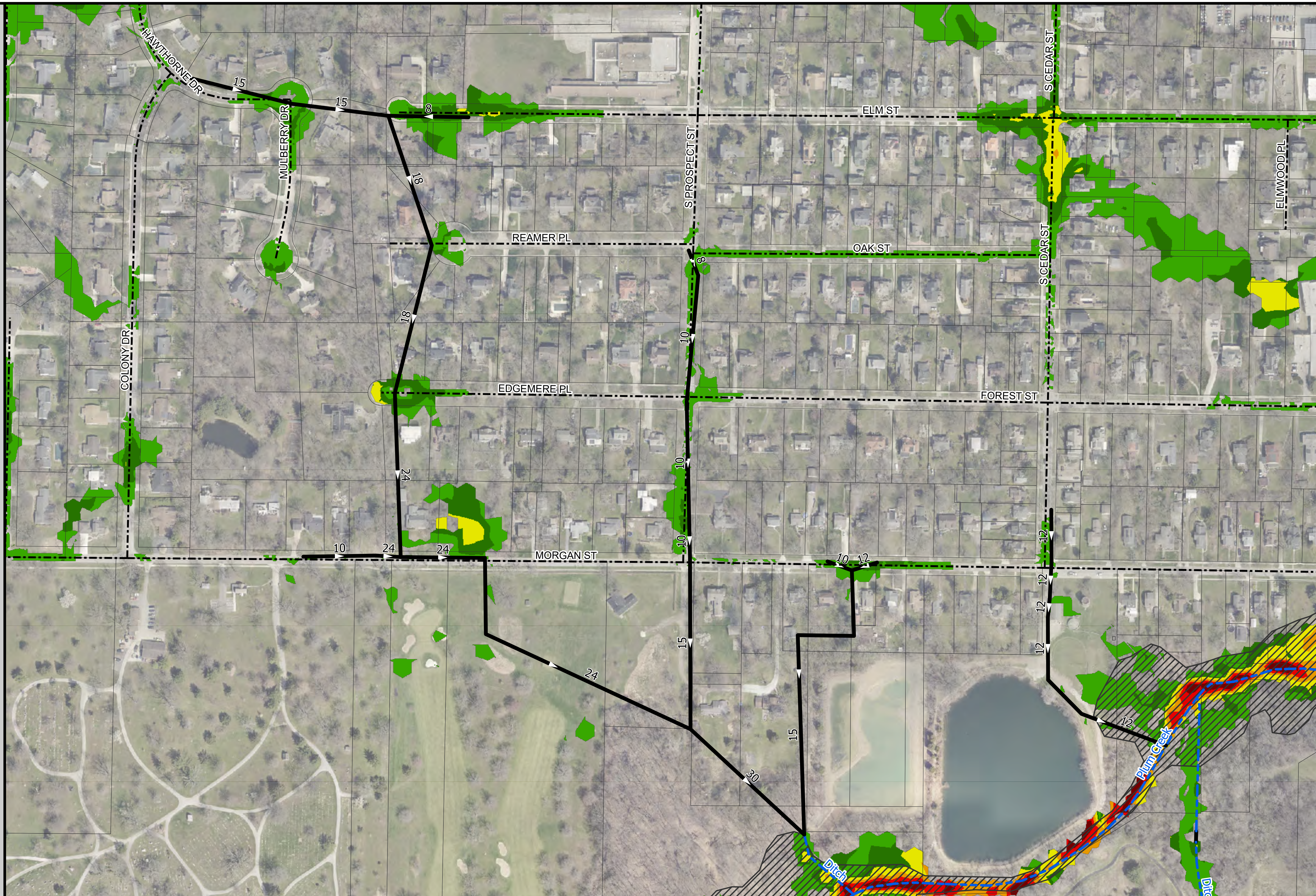
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

1-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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CITY OF OBERLIN

| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP<br>SOUTH PROSPECT STREET | DESIGN STORM | 0 50 100 200 300 Feet | | 2 / 14 |
|---|---|---|---|---|---|
| 03/12/2026 | | 1-YEAR | | | |

**LEGEND**

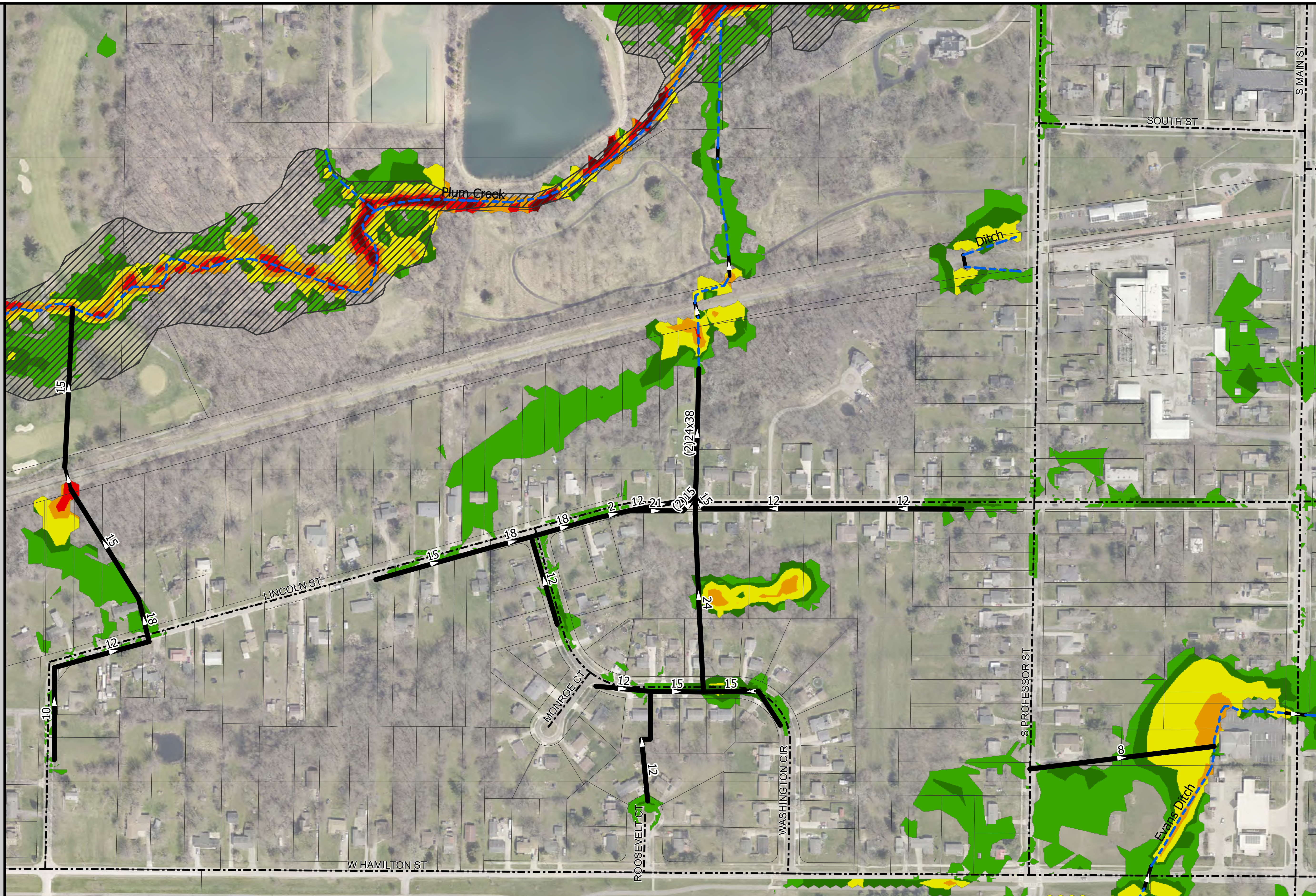
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

1-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.




| | | | | |
|---|---|---|---|---|
| KEM K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS | CITY OF OBERLIN | STORMWATER STRATEGIC PLAN<br>03/12/2026 | FLOOD RASTER MAP<br>LINCOLN STREET | DESIGN STORM<br>1-YEAR |

0 50 100 200 300 Feet

**LEGEND**

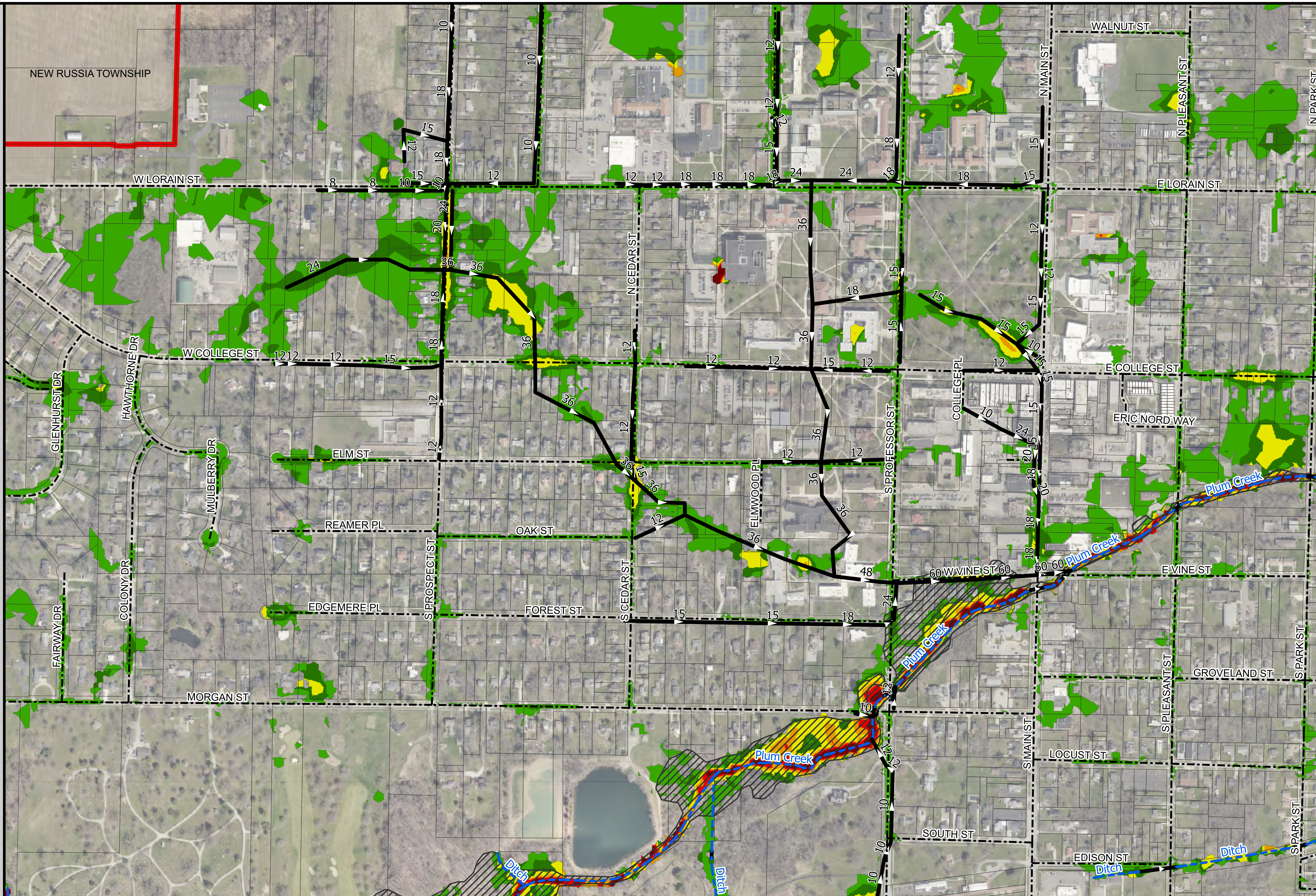
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

1-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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|---|---|
| KEM K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS | CITY OF OBERLIN |
| STORMWATER STRATEGIC PLAN | 03/12/2026 |
| FLOOD RASTER MAP WEST VINE STREET | |
| DESIGN STORM | 1-YEAR |
| 0 90 180 360 540 Feet | |

**LEGEND**

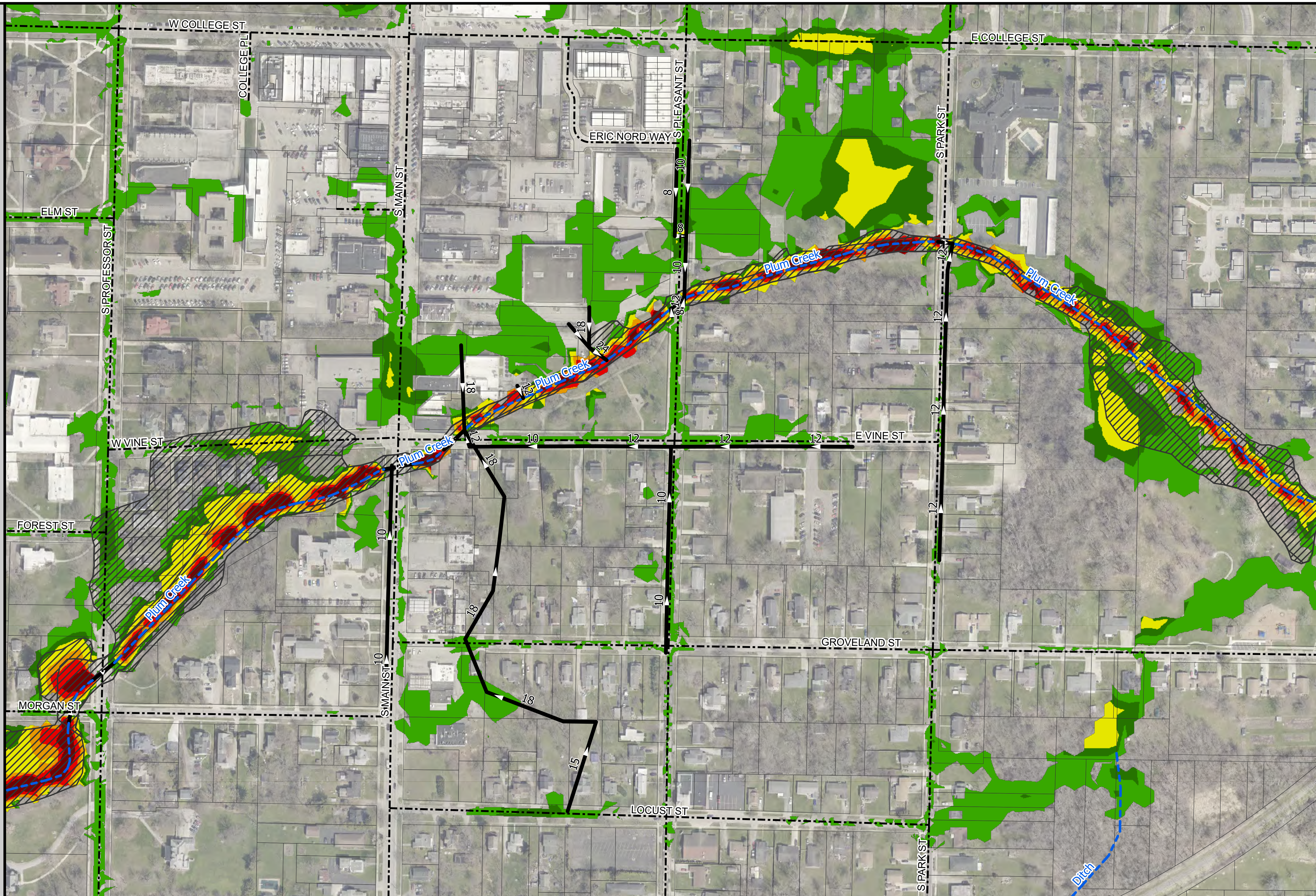
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

1-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.




| | | | | | | |
|---|---|---|---|---|---|---|
| KEM K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS | CITY OF OBERLIN | STORMWATER STRATEGIC PLAN<br>03/12/2026 | FLOOD RASTER MAP<br>EAST VINE STREET - SOUTH PLEASANT STREET | DESIGN STORM<br>1-YEAR | 0 45 90 180 270 Feet | 5 / 14 |

## LEGEND

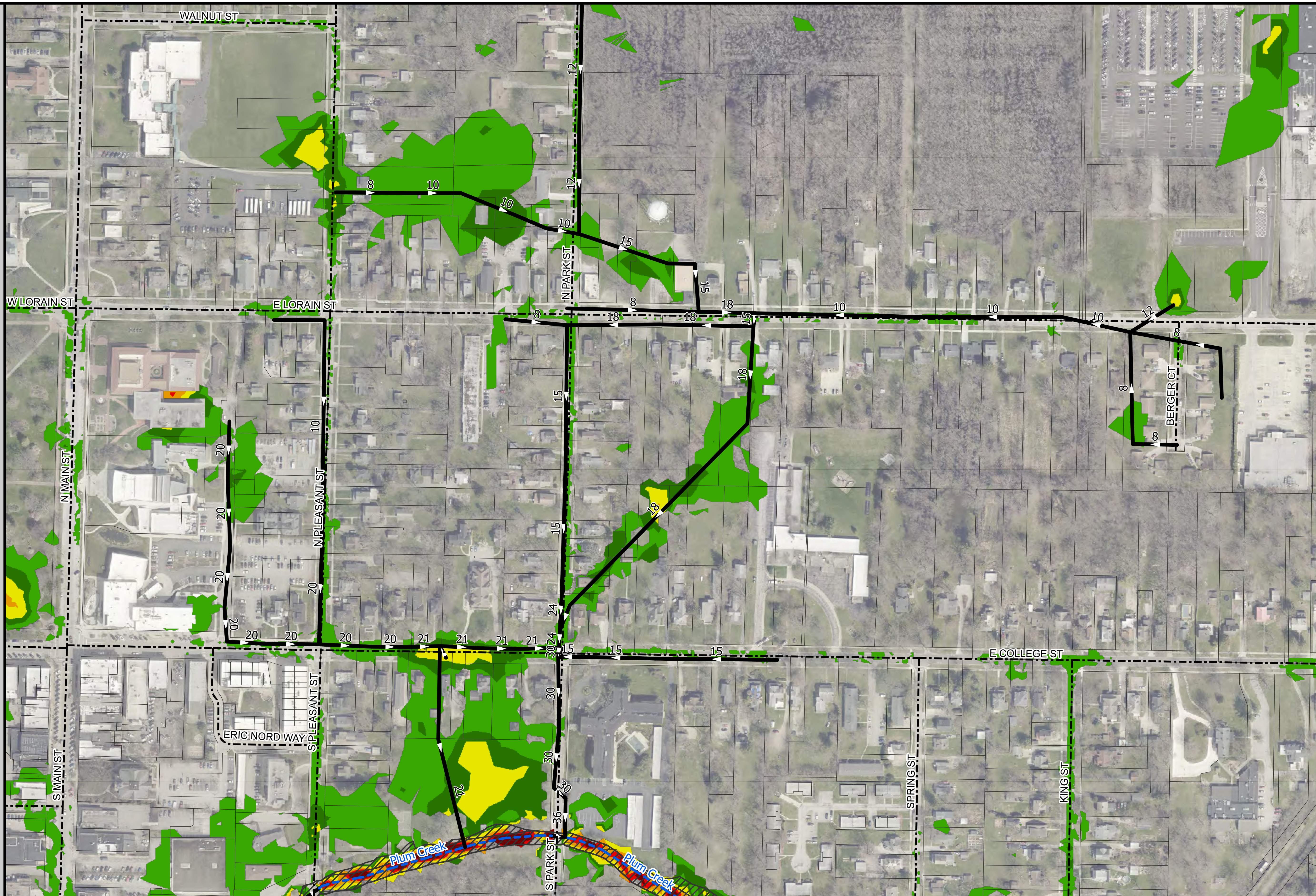
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

1-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
NORTH / SOUTH PARK STREET

DESIGN STORM

1-YEAR

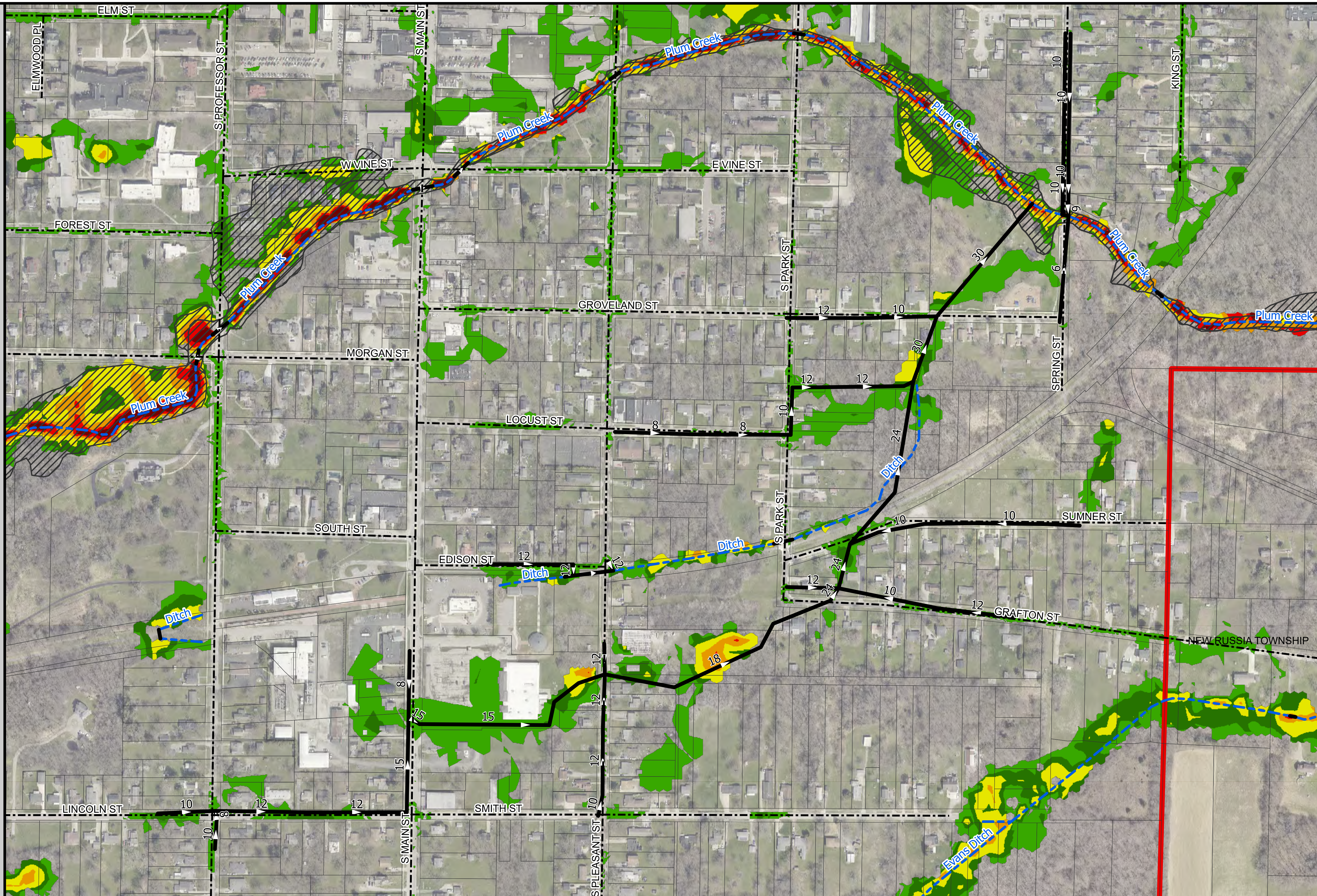
0 50 100 200 300 Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

1-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

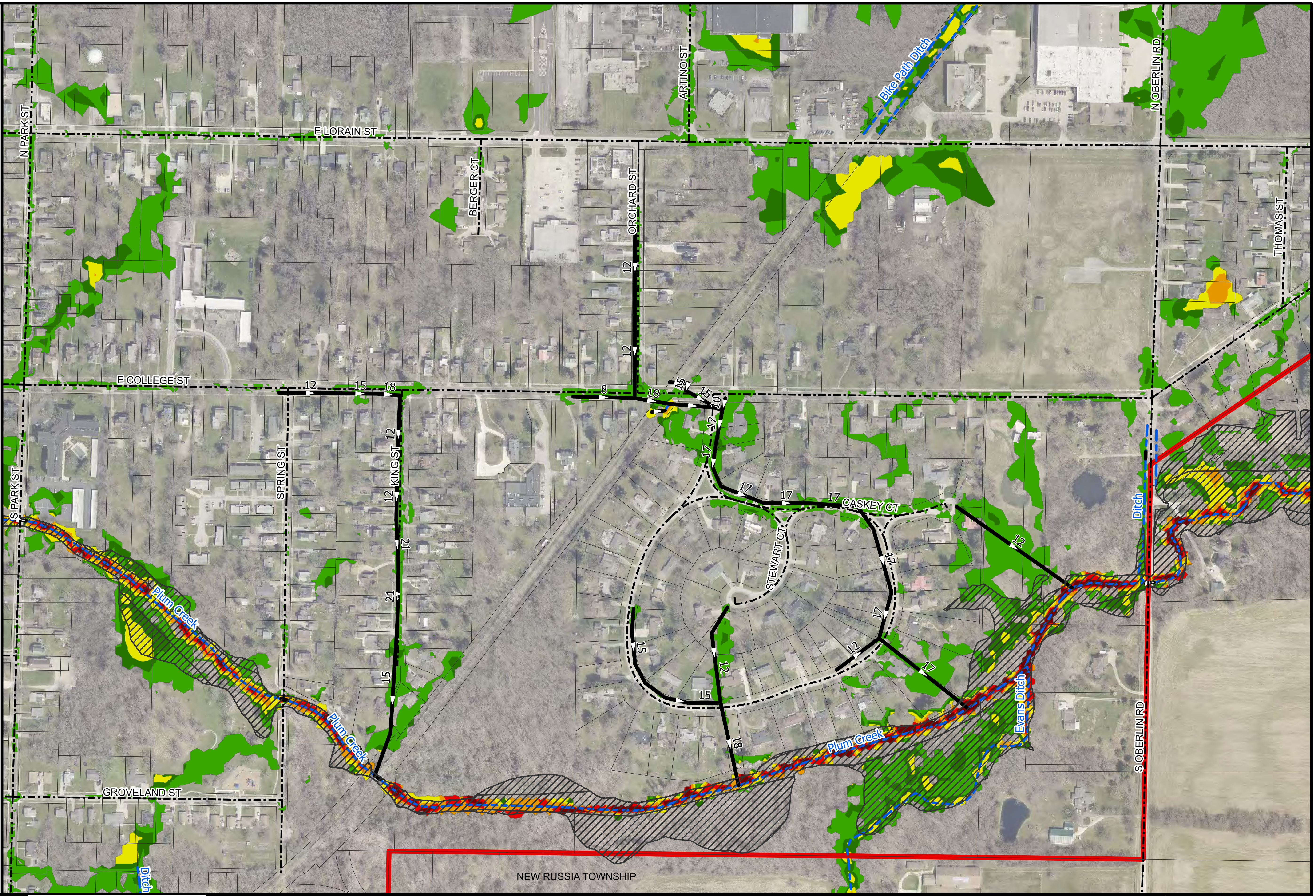
03/12/2026

FLOOD RASTER MAP
SOUTH PARK STREET - GROVELAND STREET

DESIGN STORM

1-YEAR

0 65 130 260 390
Feet




**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

1-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
KING STREET - SHIPHERD CIRCLE

DESIGN STORM

1-YEAR

0 65 130 260 390 Feet

## LEGEND

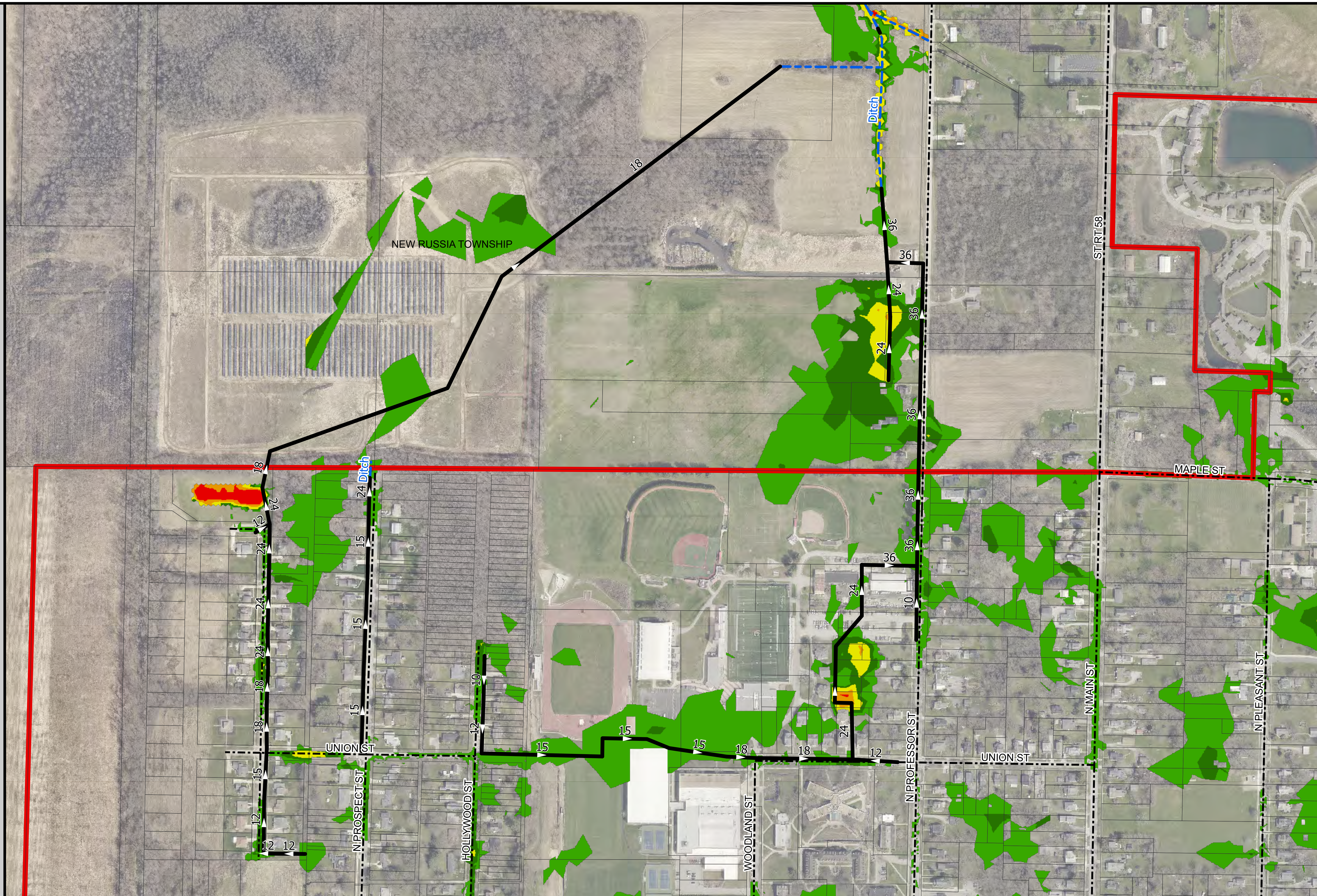
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

1-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
NORTH PROFESSOR STREET

DESIGN STORM

1-YEAR

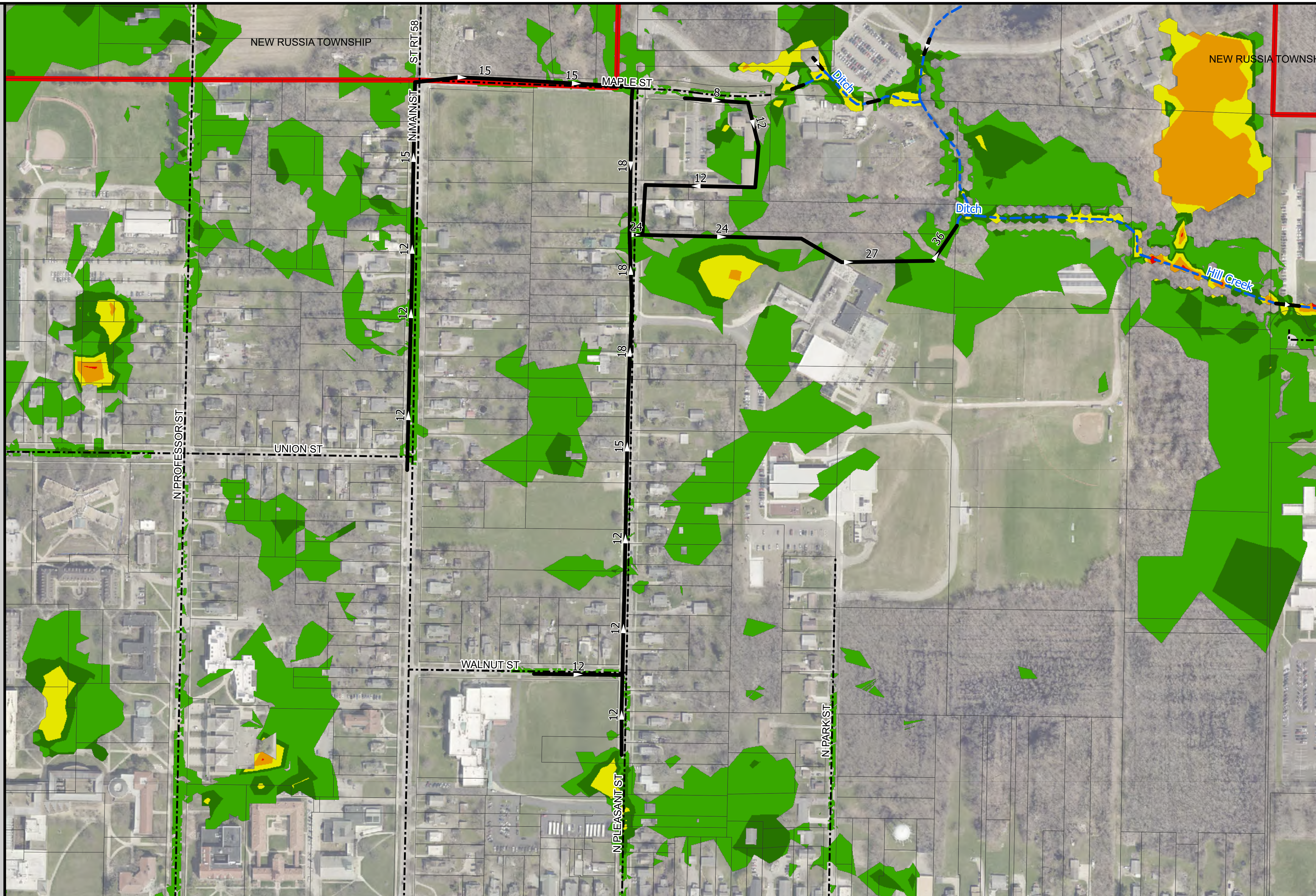
0 75 150 300 450 Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

1-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

| | | | | |
|---|---|---|---|---|
| K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS | STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP MAPLE STREET | DESIGN STORM | 10 / 14 |
| CITY OF OBERLIN | 03/12/2026 | | 1-YEAR | |

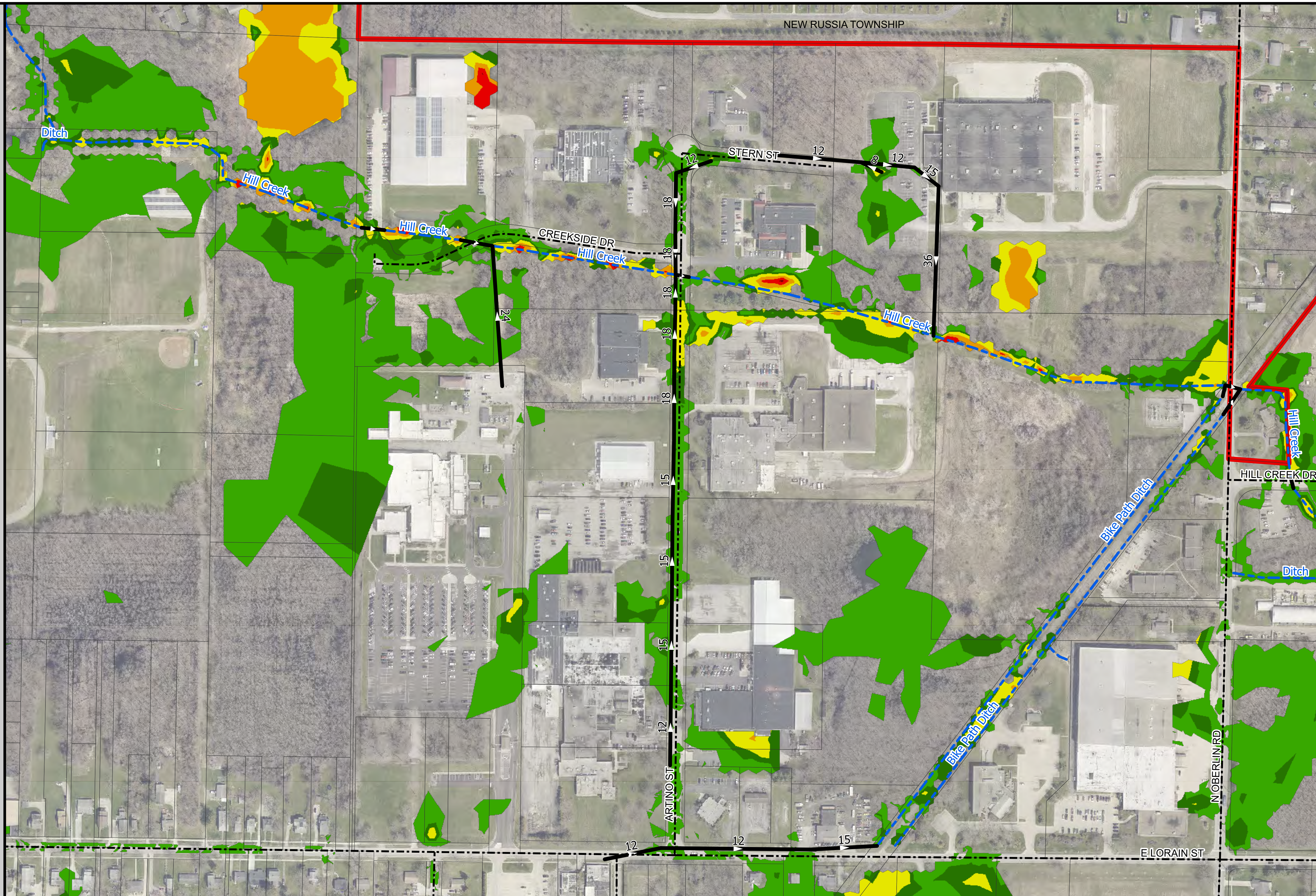
0 55 110 220 330 Feet

**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

1-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
ARTINO STREET

DESIGN STORM

1-YEAR

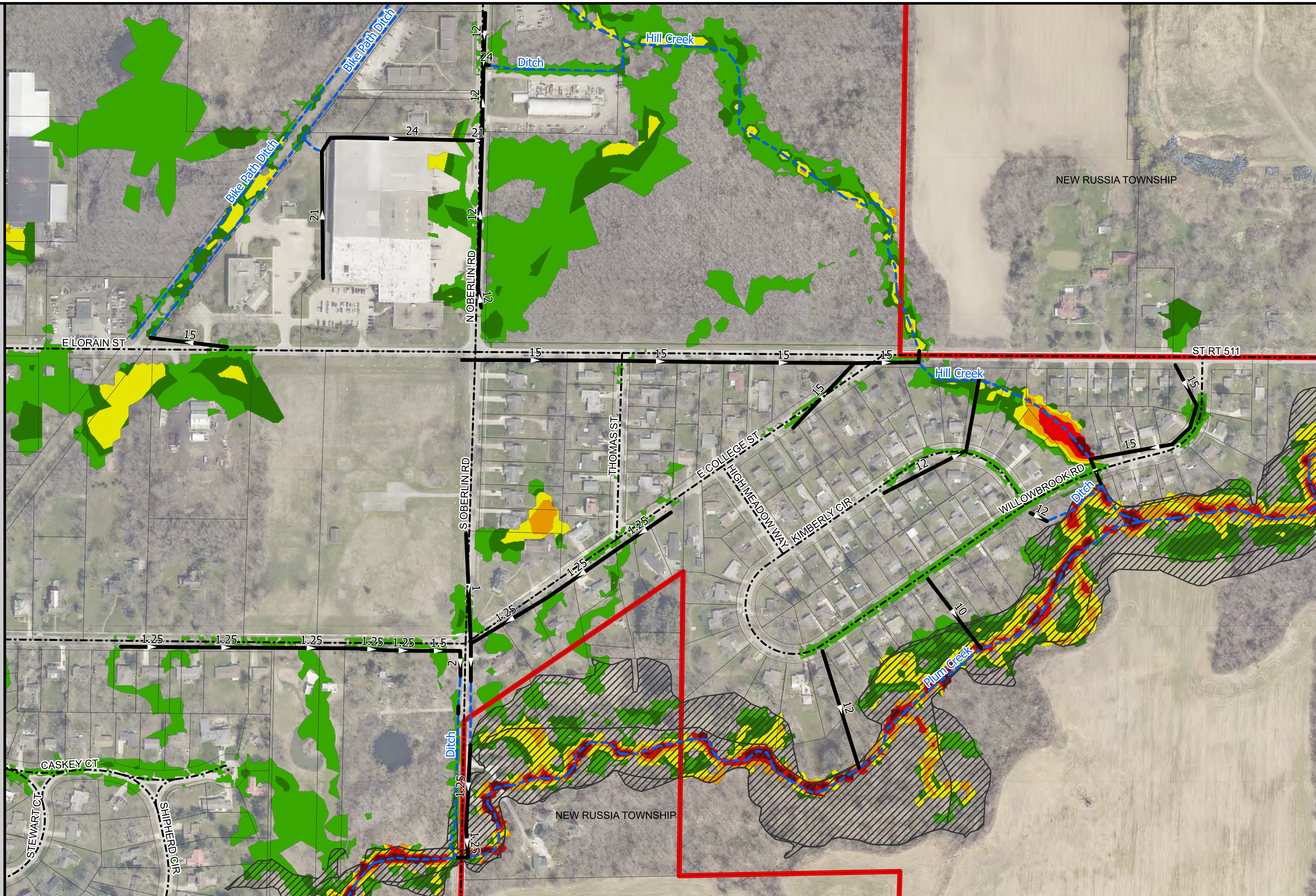
0 55 110 220 330
Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

1-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

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| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP<br>NORTH OBERLIN ROAD - EAST LORAIN STREET | DESIGN STORM |
|---|---|---|
| 03/12/2026 | | 1-YEAR |

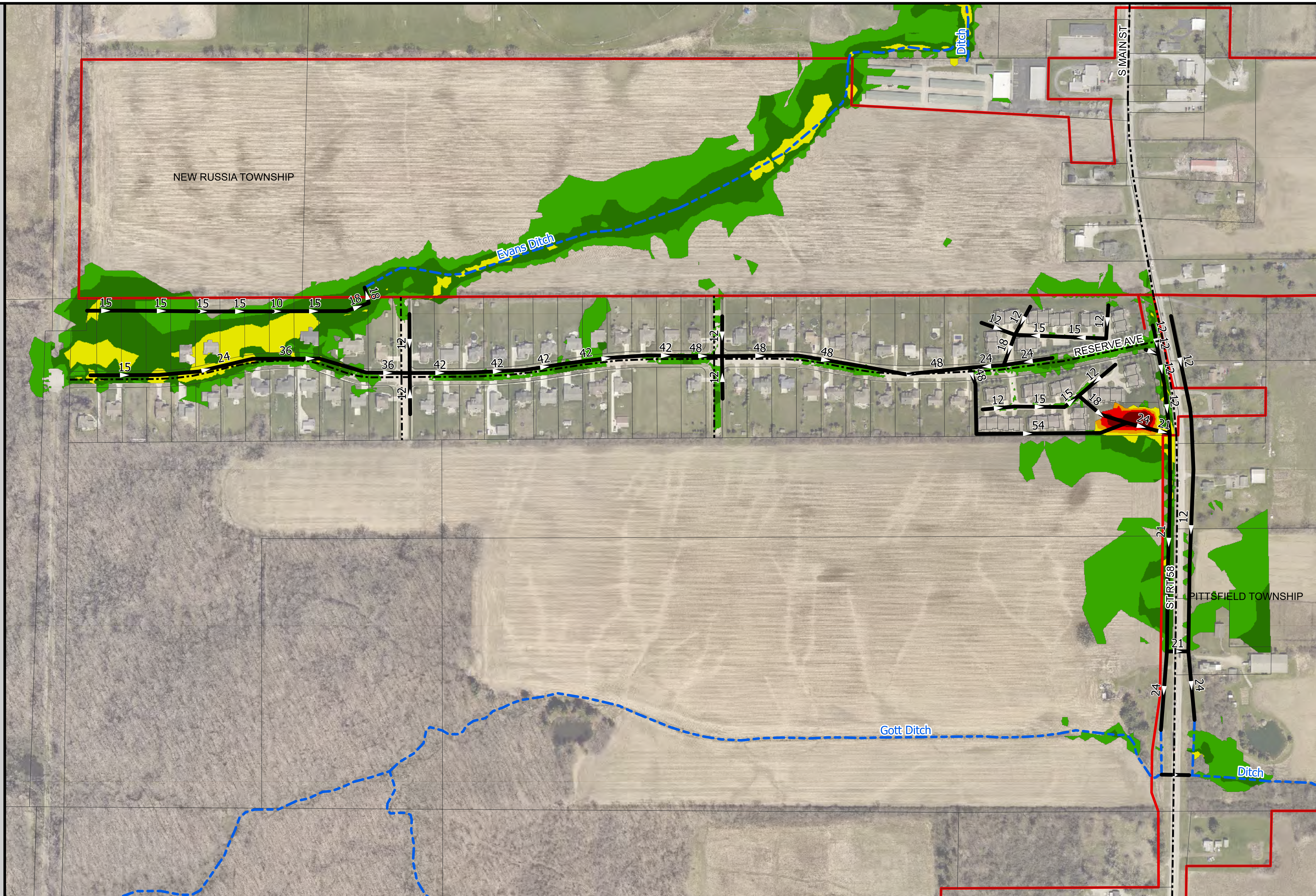
0 55 110 220 330 Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

1-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
RESERVE AVENUE

DESIGN STORM

1-YEAR

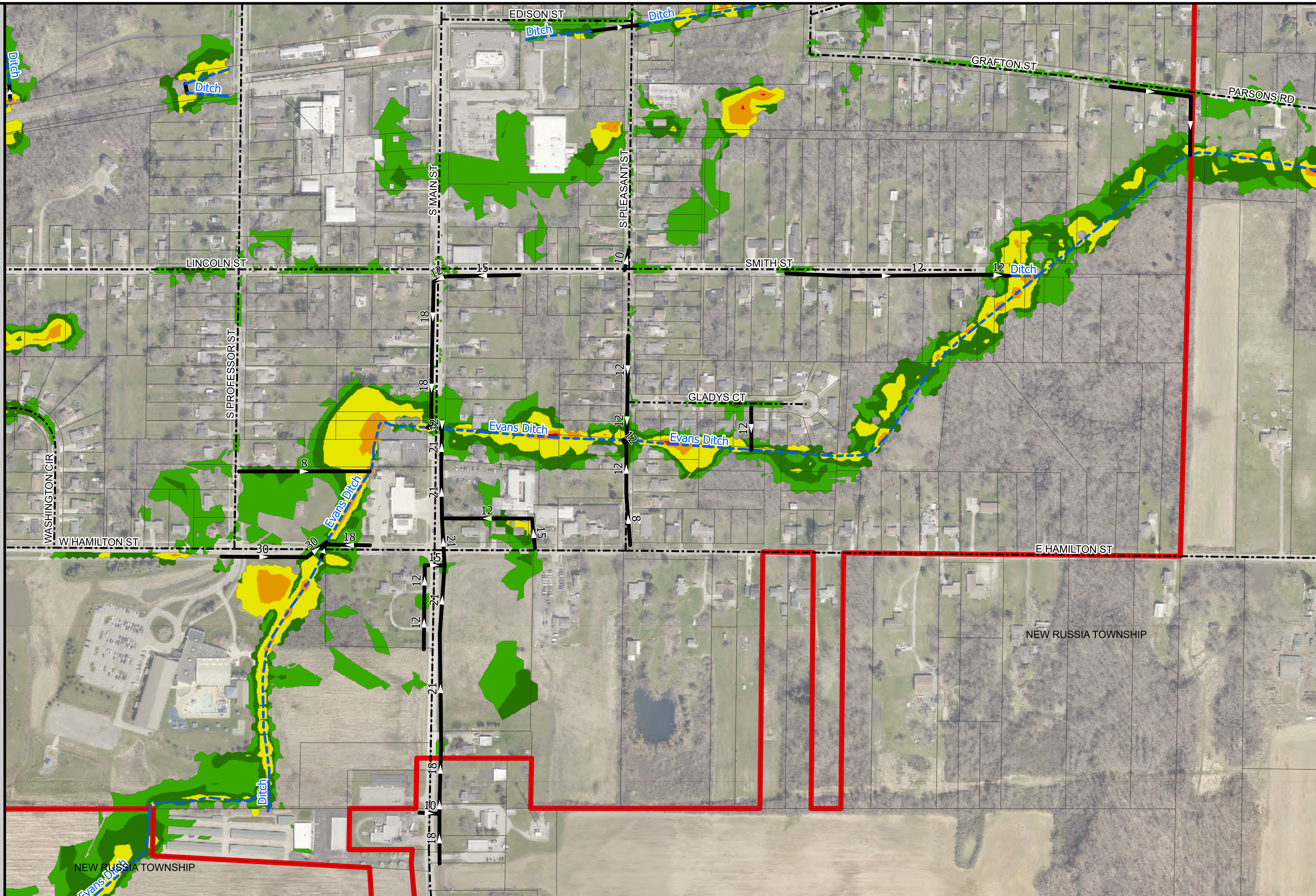
0 65 130 260 390 Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

1-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
SOUTH MAIN STREET

DESIGN STORM

1-YEAR

0 65 130 260 390
Feet

# Appendix D-02

# 10 Year Design Storm

# Flood Raster Maps

## LEGEND

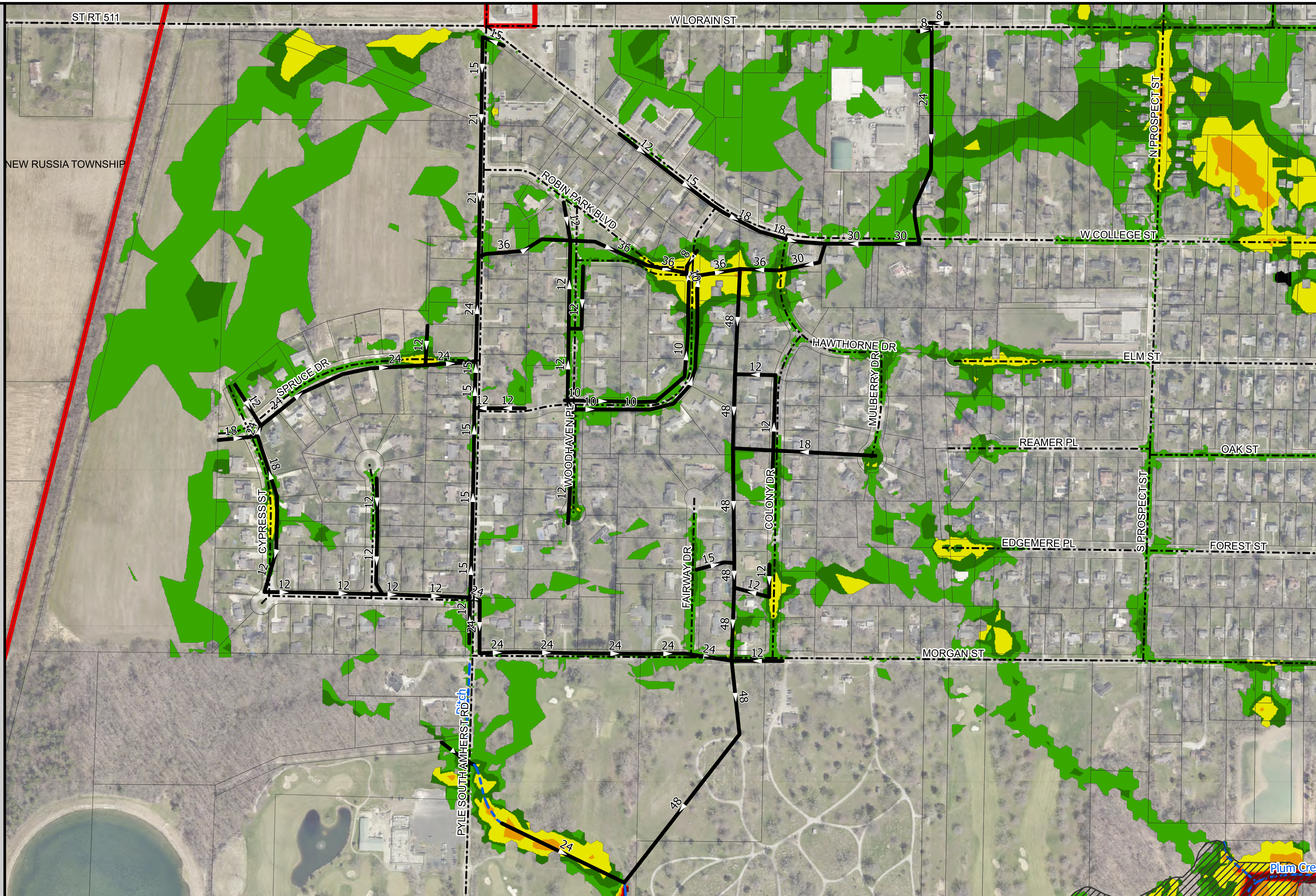
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

10-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
COLONY DRIVE - MORGAN STREET

DESIGN STORM

10-YEAR

0 75 150 300 450 Feet

**LEGEND**

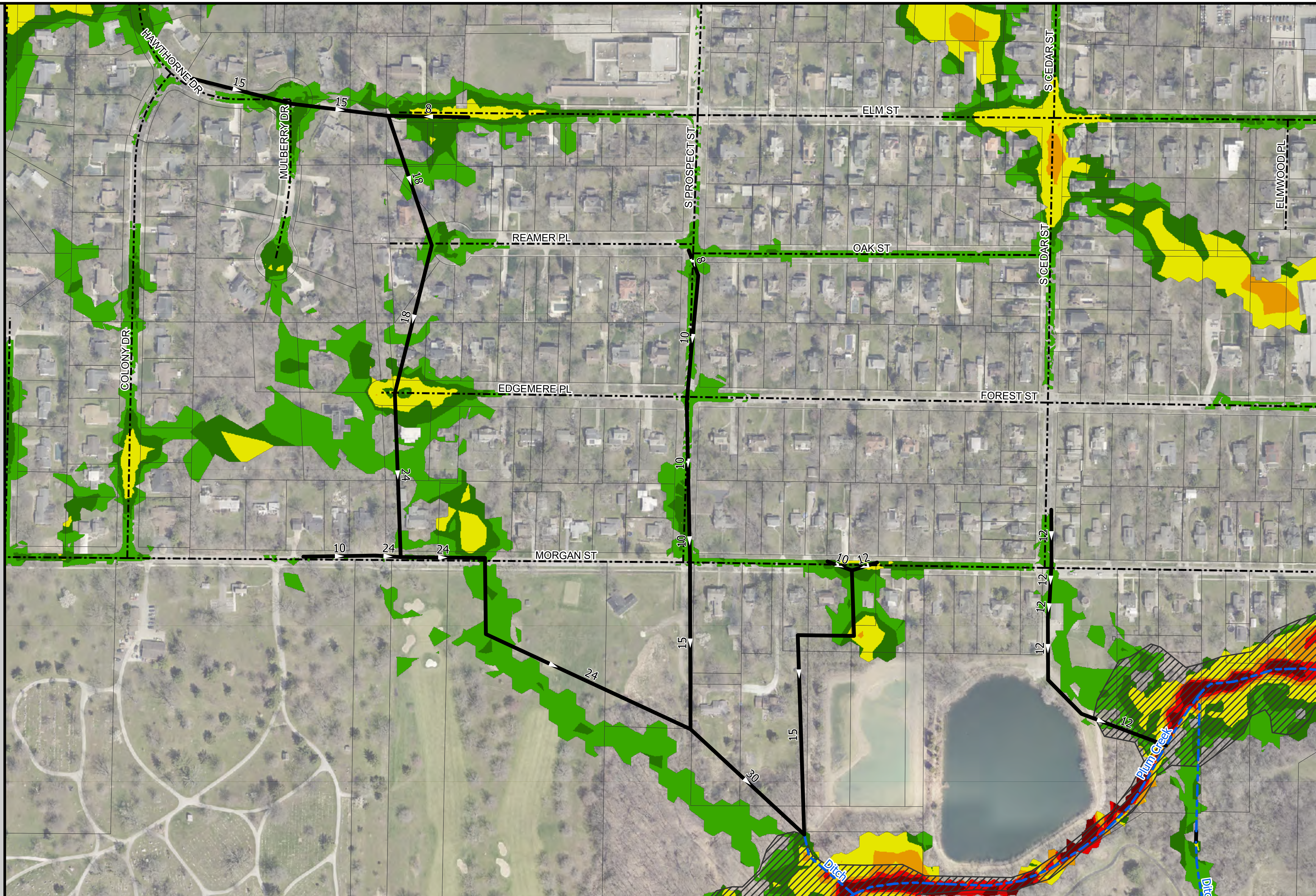
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

10-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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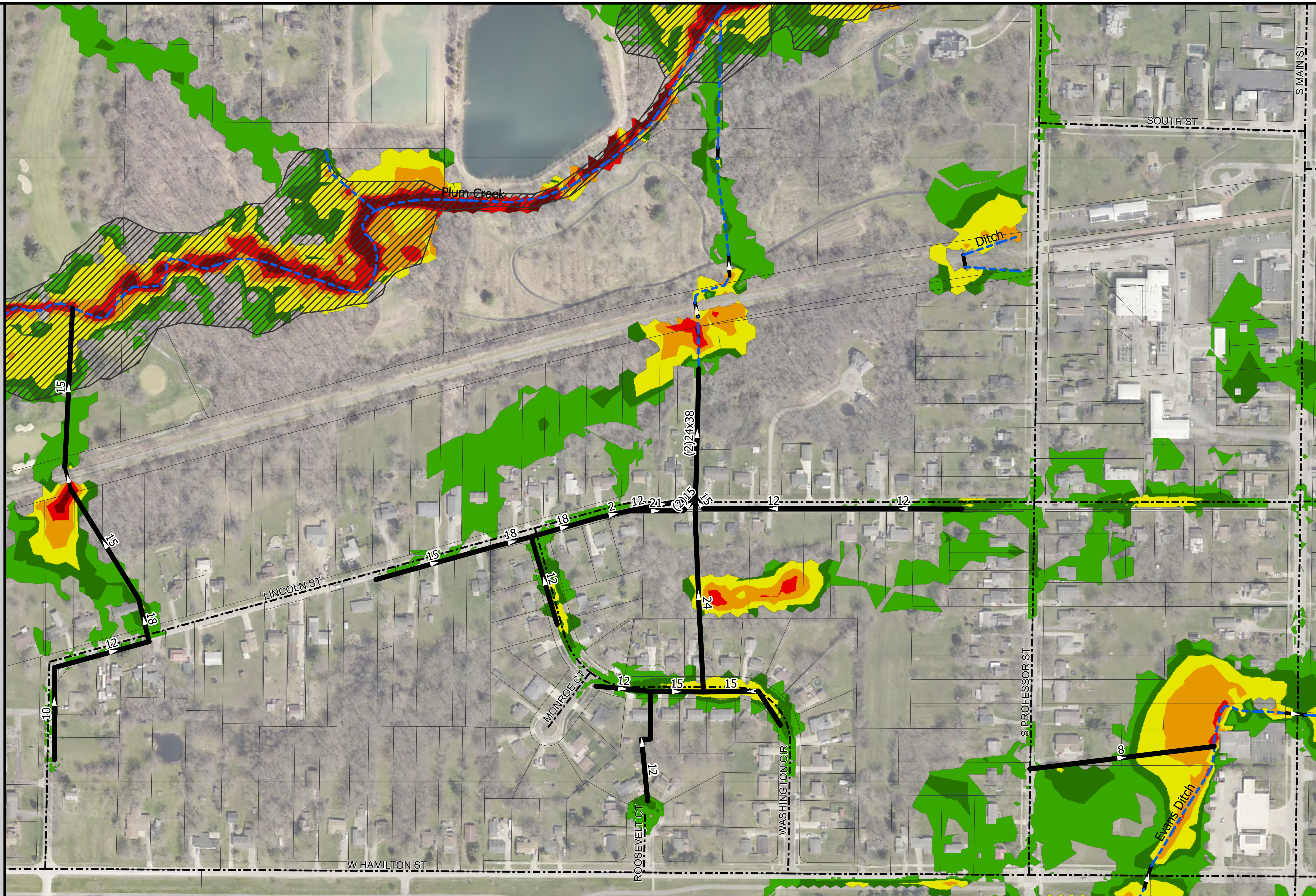
| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP<br>SOUTH PROSPECT STREET | DESIGN STORM | 0 50 100 200 300 Feet | 2 / 14 |
|---|---|---|---|---|
| 03/12/2026 | | 10-YEAR | | |

**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

10-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
LINCOLN STREET

DESIGN STORM

10-YEAR

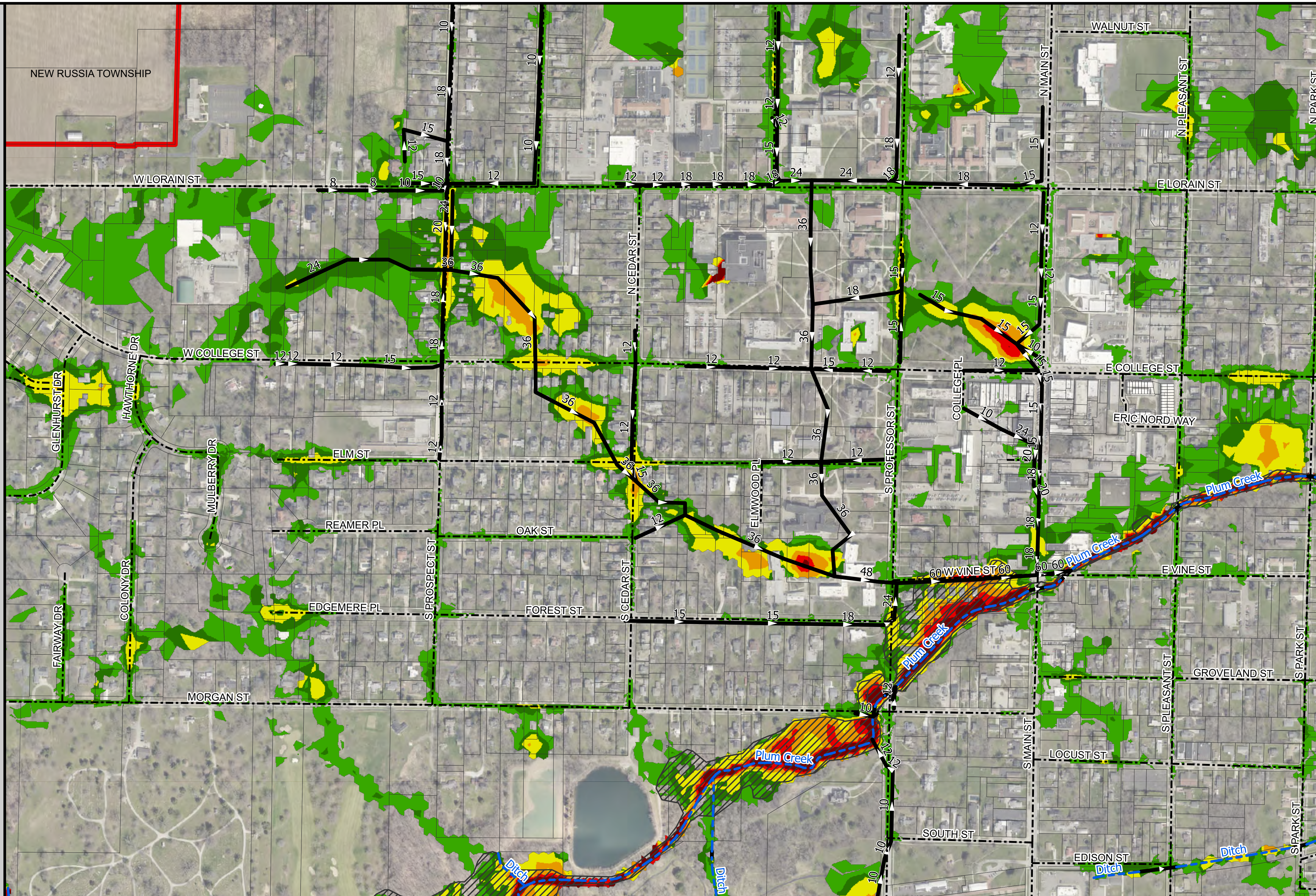
0 50 100 200 300
Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

10-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

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| | | | | | | | |
|---|---|---|---|---|---|---|---|
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## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

10-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

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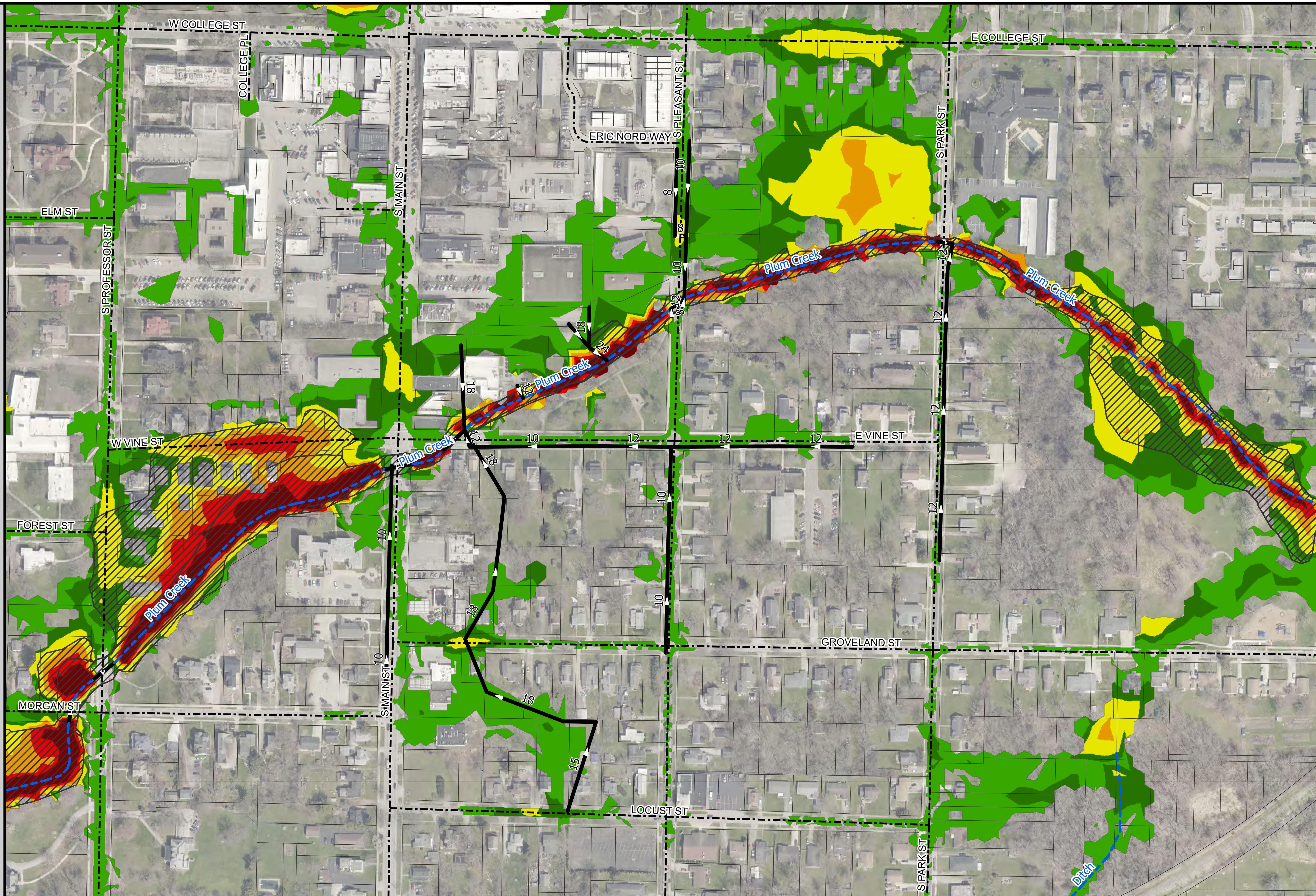


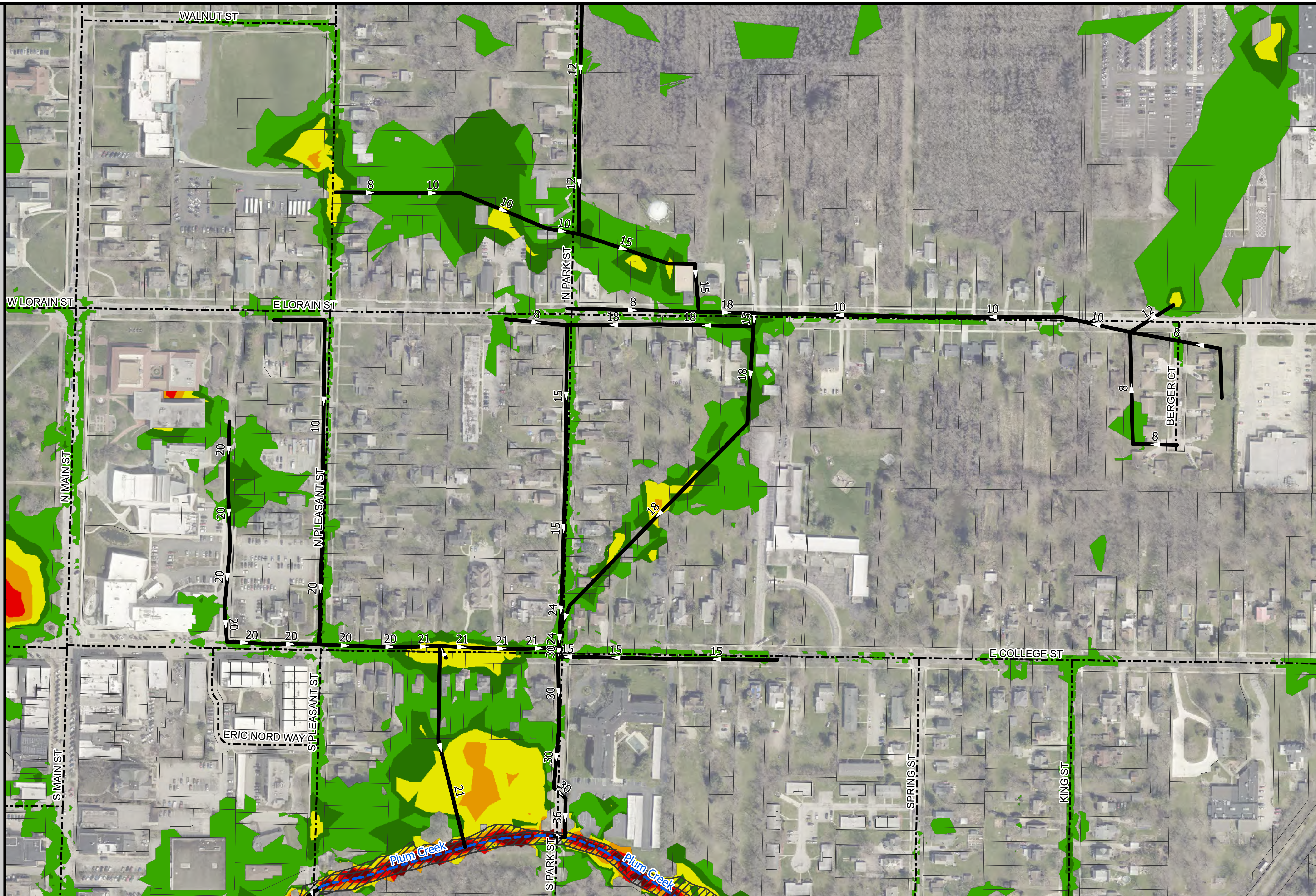

| | | | | | |
|---|---|---|---|---|---|
| K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS | STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP<br>EAST VINE STREET - SOUTH PLEASANT STREET | DESIGN STORM | 0 45 90 180 270 Feet | 5 / 14 |
| | 03/12/2026 | | 10-YEAR | | |

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

10-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
NORTH / SOUTH PARK STREET

DESIGN STORM

10-YEAR

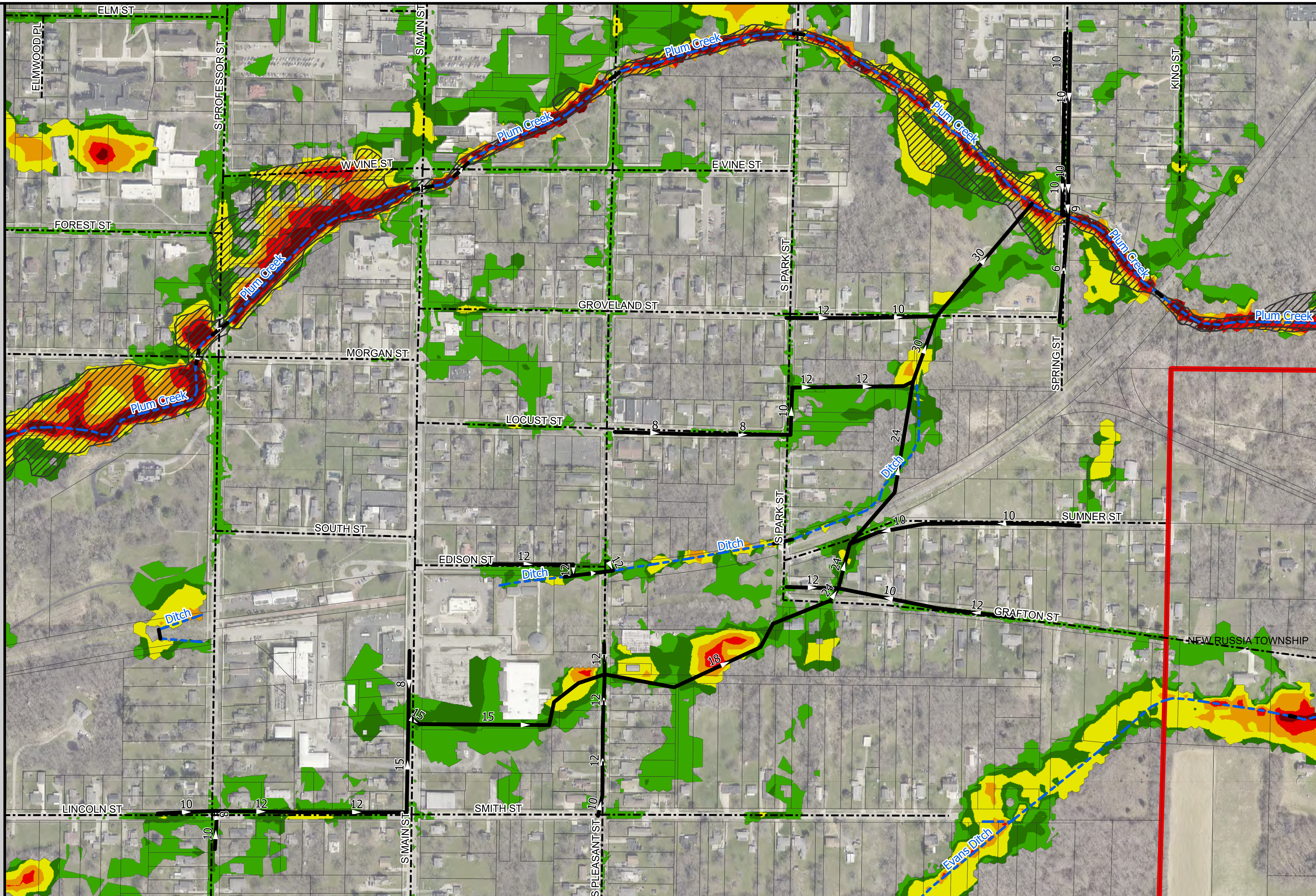
0 50 100 200 300
Feet

**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- Culverts
- FEMA Flood Hazard

10-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

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STORMWATER STRATEGIC PLAN

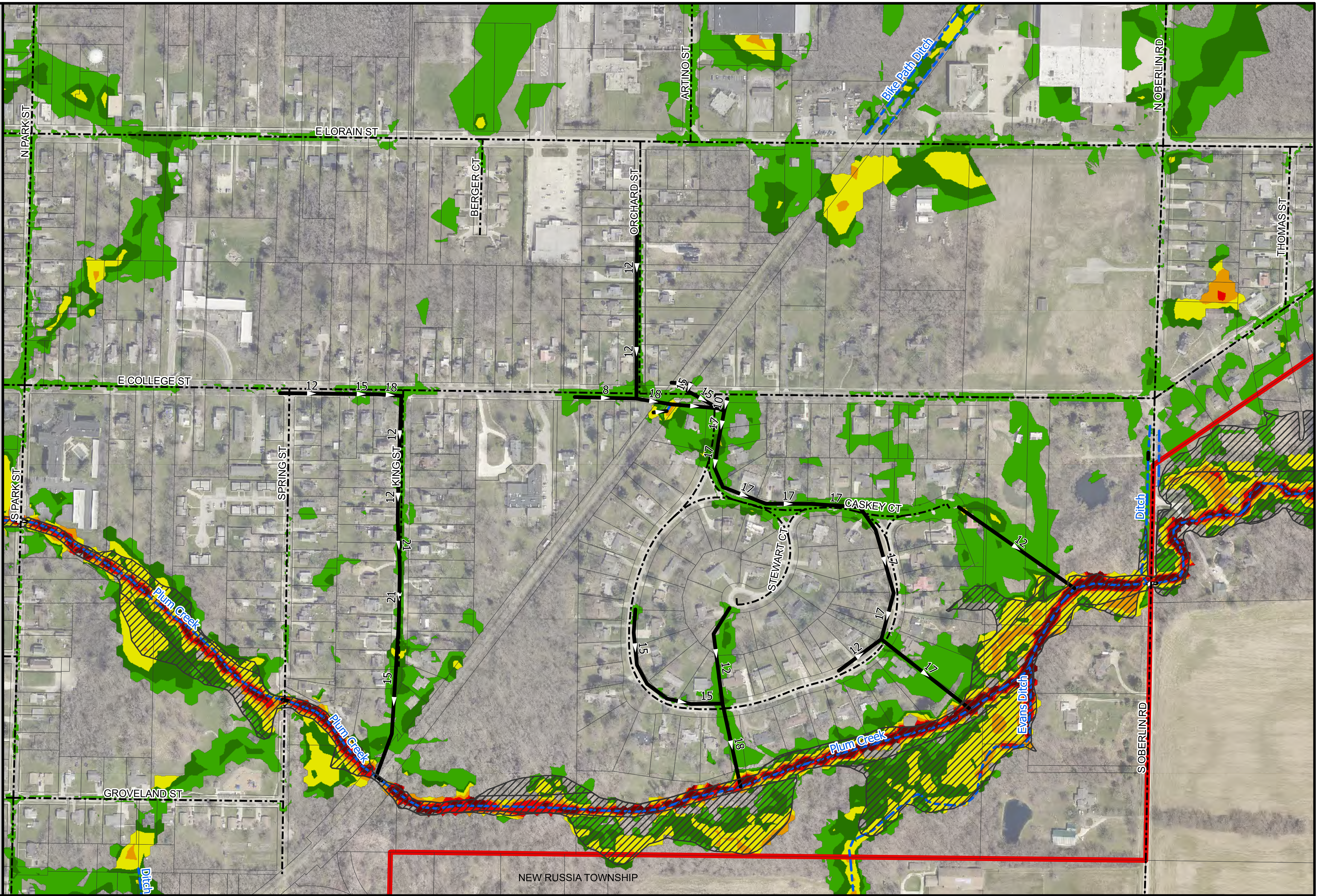
03/12/2026

FLOOD RASTER MAP
SOUTH PARK STREET - GROVELAND STREET

DESIGN STORM

10-YEAR

0 65 130 260 390
Feet




**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

10-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
KING STREET - SHIPHERD CIRCLE

DESIGN STORM

10-YEAR

0 65 130 260 390 Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

10-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

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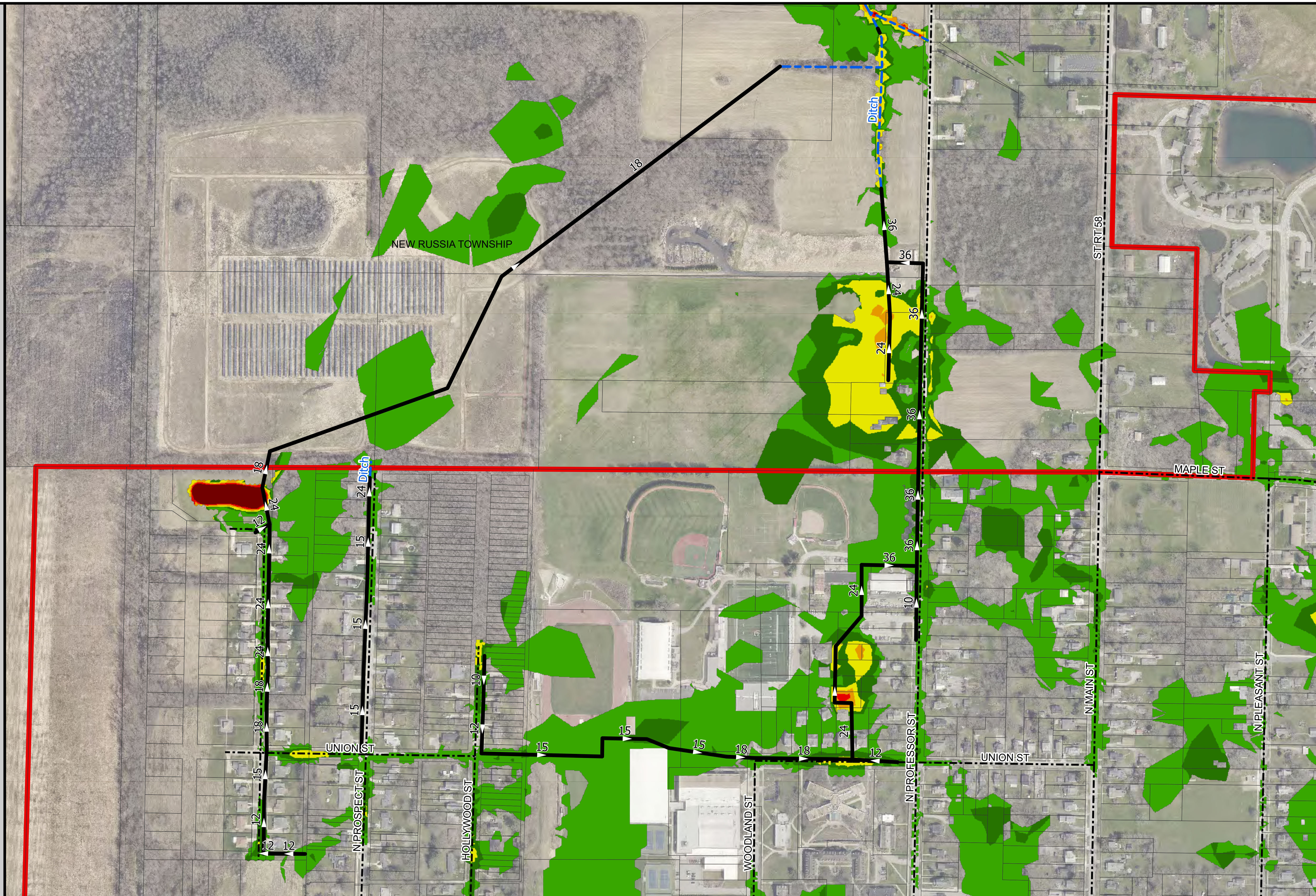


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| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP<br>NORTH PROFESSOR STREET | DESIGN STORM |
|---|---|---|
| 03/12/2026 | | 10-YEAR |

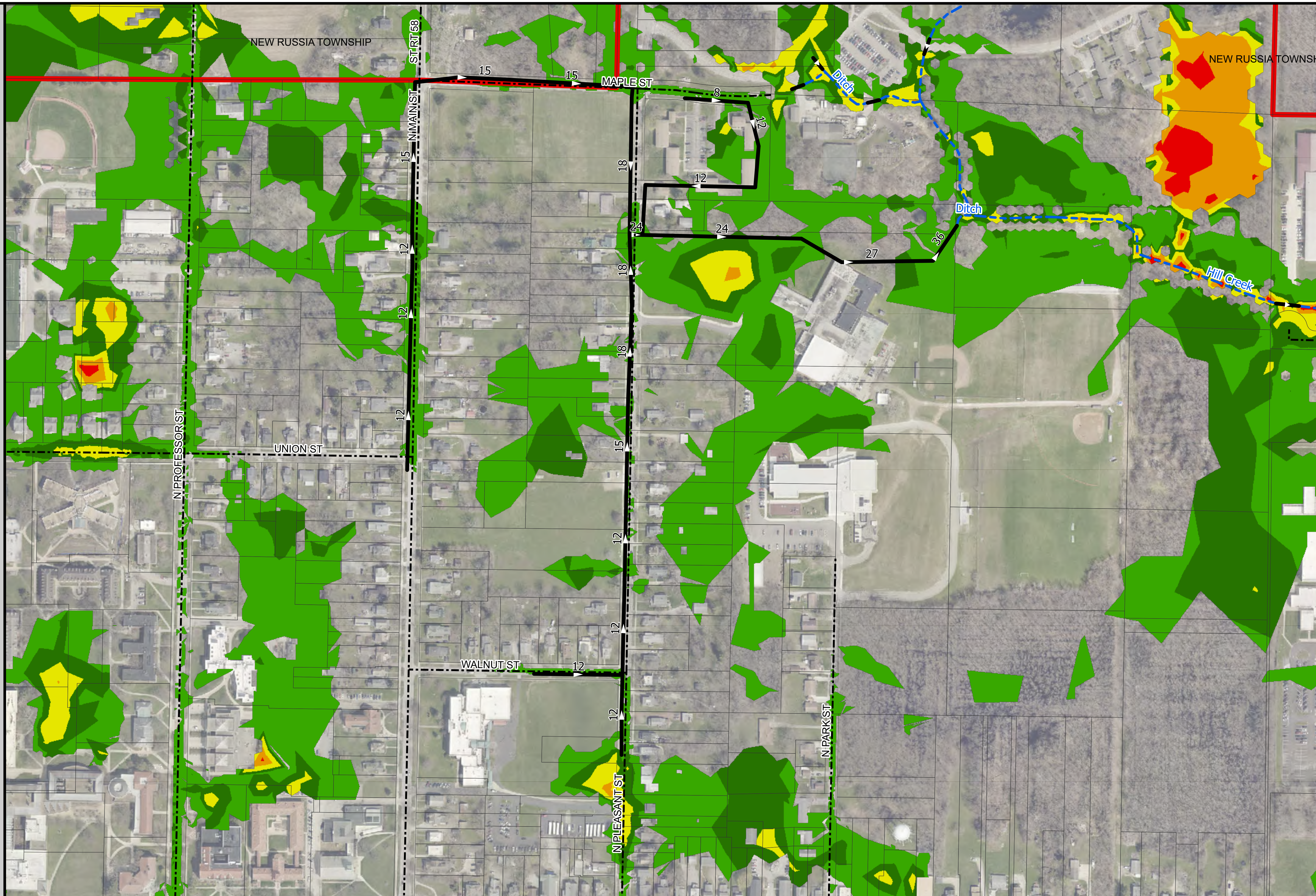
0 75 150 300 450
Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

10-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

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| | | | | | |
|---|---|---|---|---|---|
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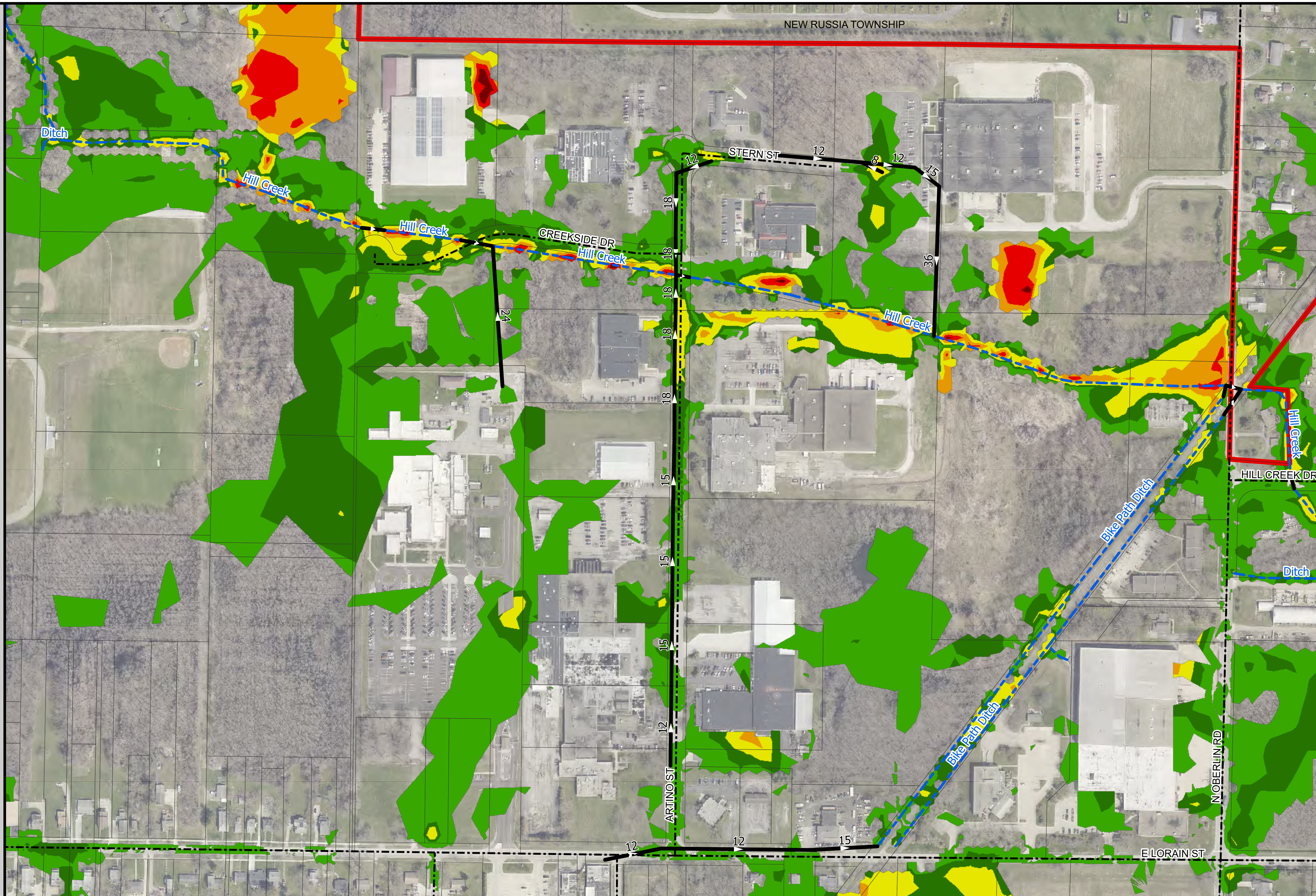
## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

10-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

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| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP ARTINO STREET | DESIGN STORM |
| --- | --- | --- |
| 03/12/2026 | | 10-YEAR |

0 55 110 220 330
Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

10-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

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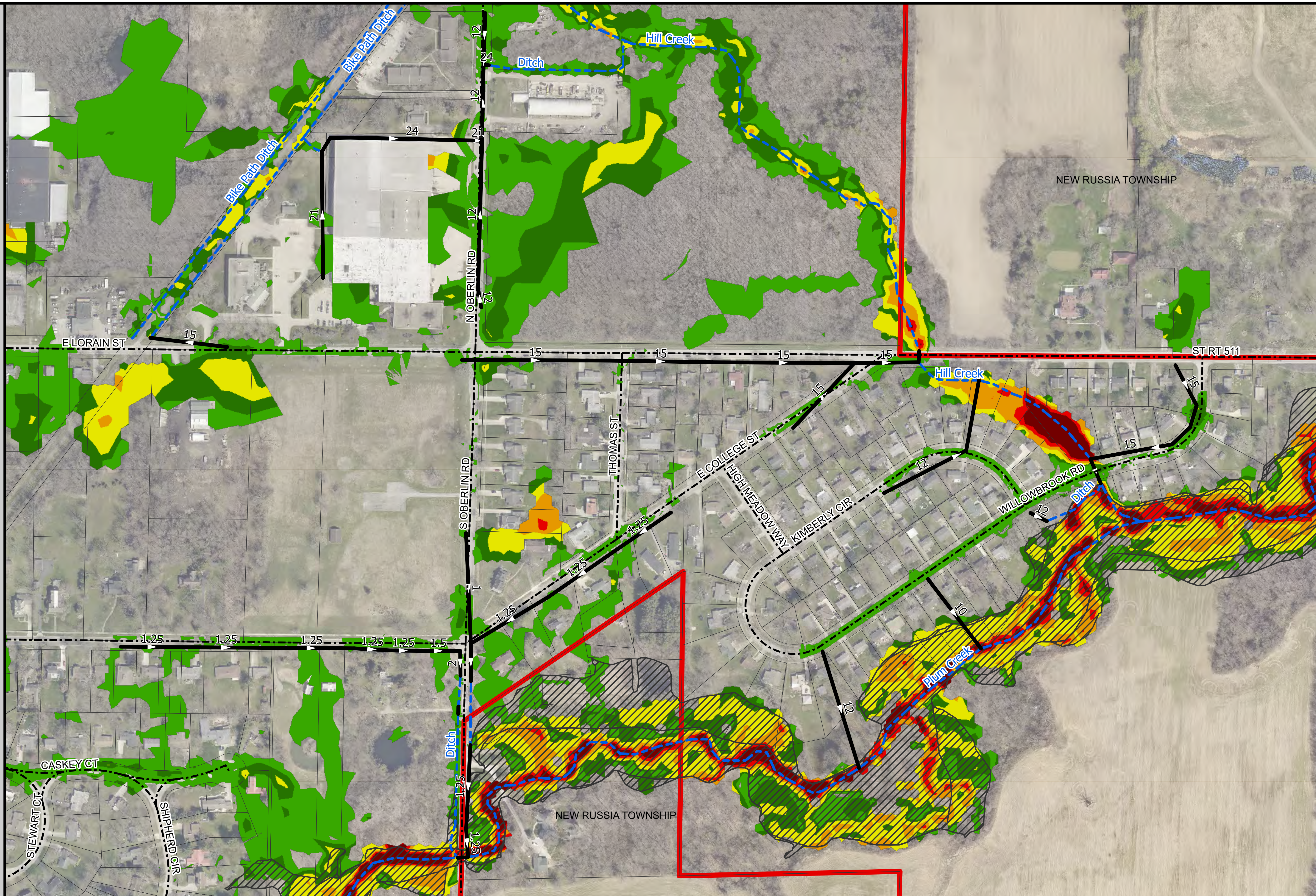


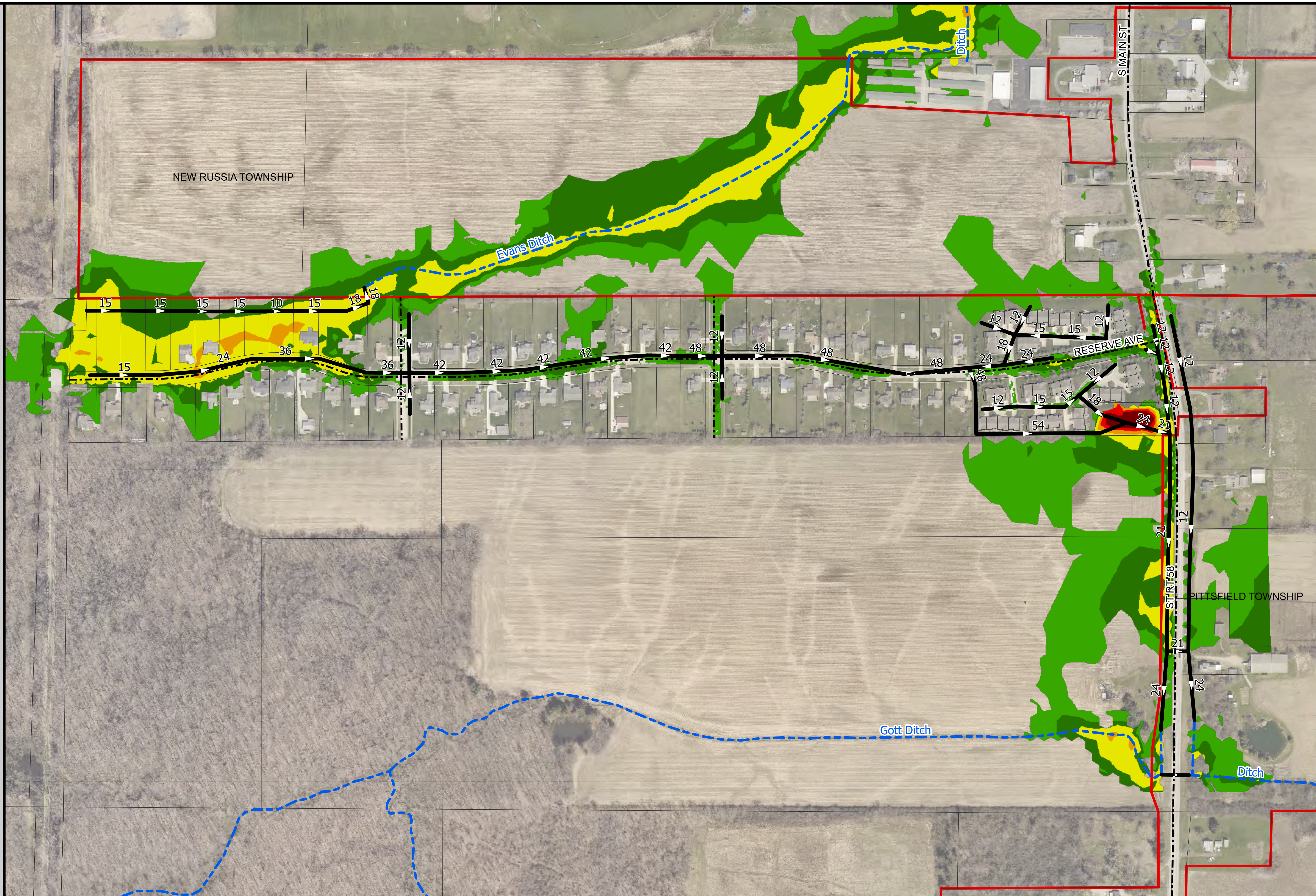

| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP<br>NORTH OBERLIN ROAD - EAST LORAIN STREET | DESIGN STORM | 0 55 110 220 330 Feet | 12 / 14 |
|---|---|---|---|---|
| 03/12/2026 | | 10-YEAR | | |

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

10-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
RESERVE AVENUE

DESIGN STORM

10-YEAR

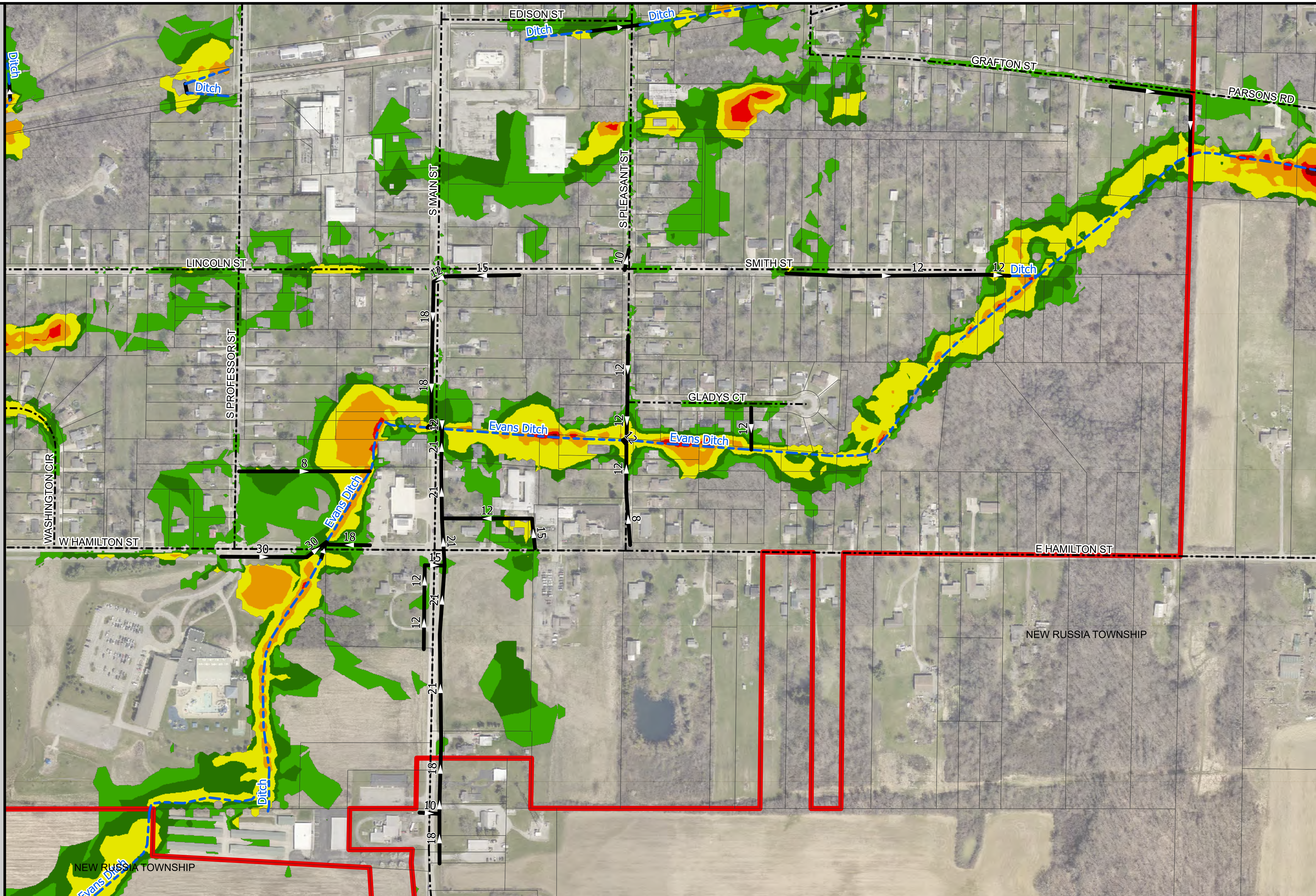
0 65 130 260 390
Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

10-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

| | | | | |
|---|---|---|---|---|
| K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS | STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP SOUTH MAIN STREET | DESIGN STORM | 14 / 14 |
| CITY OF OBERLIN | 03/12/2026 | | 10-YEAR | |

0 65 130 260 390 Feet

# Appendix D-03

# 50 Year Design Storm

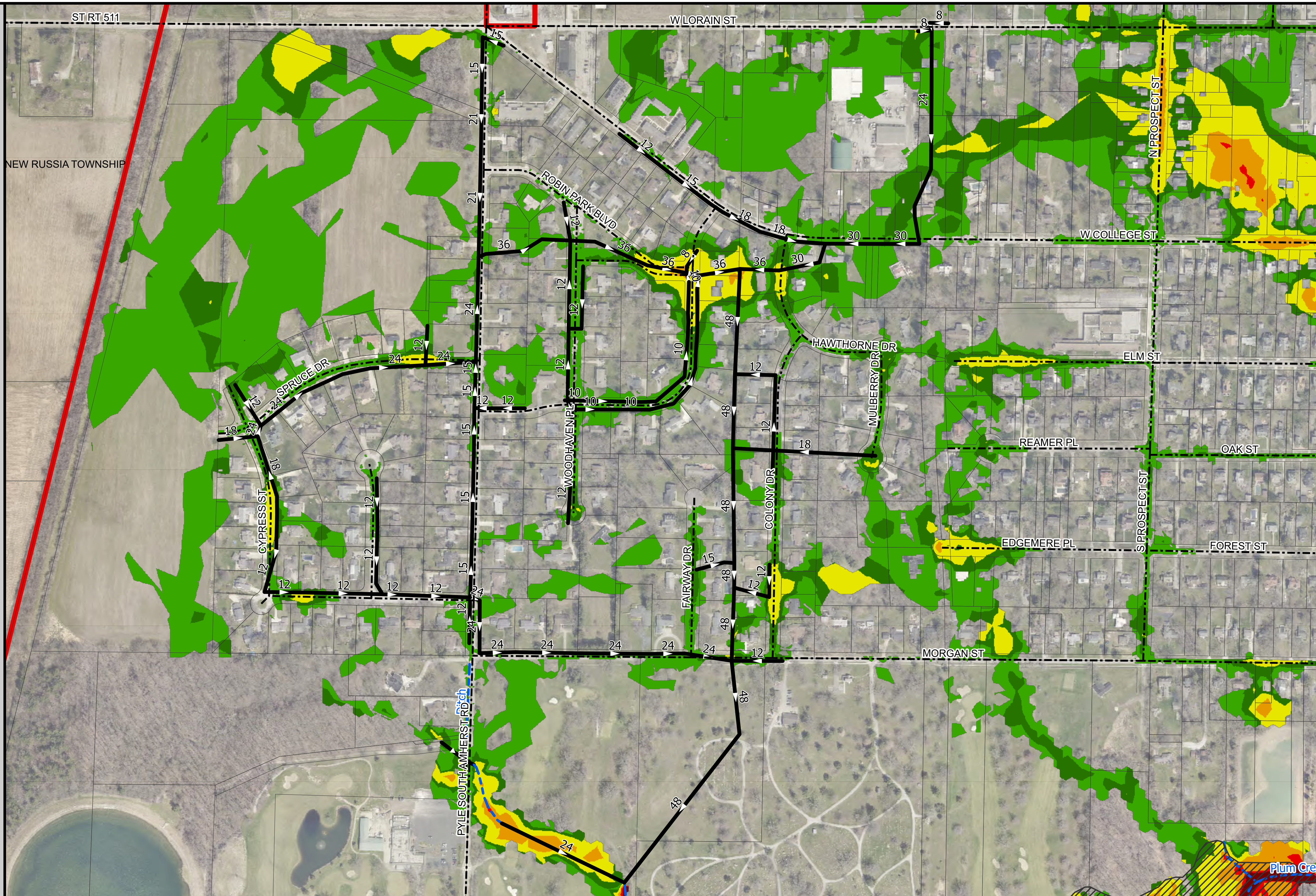
# Flood Raster Maps

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

50-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




**Notes:**

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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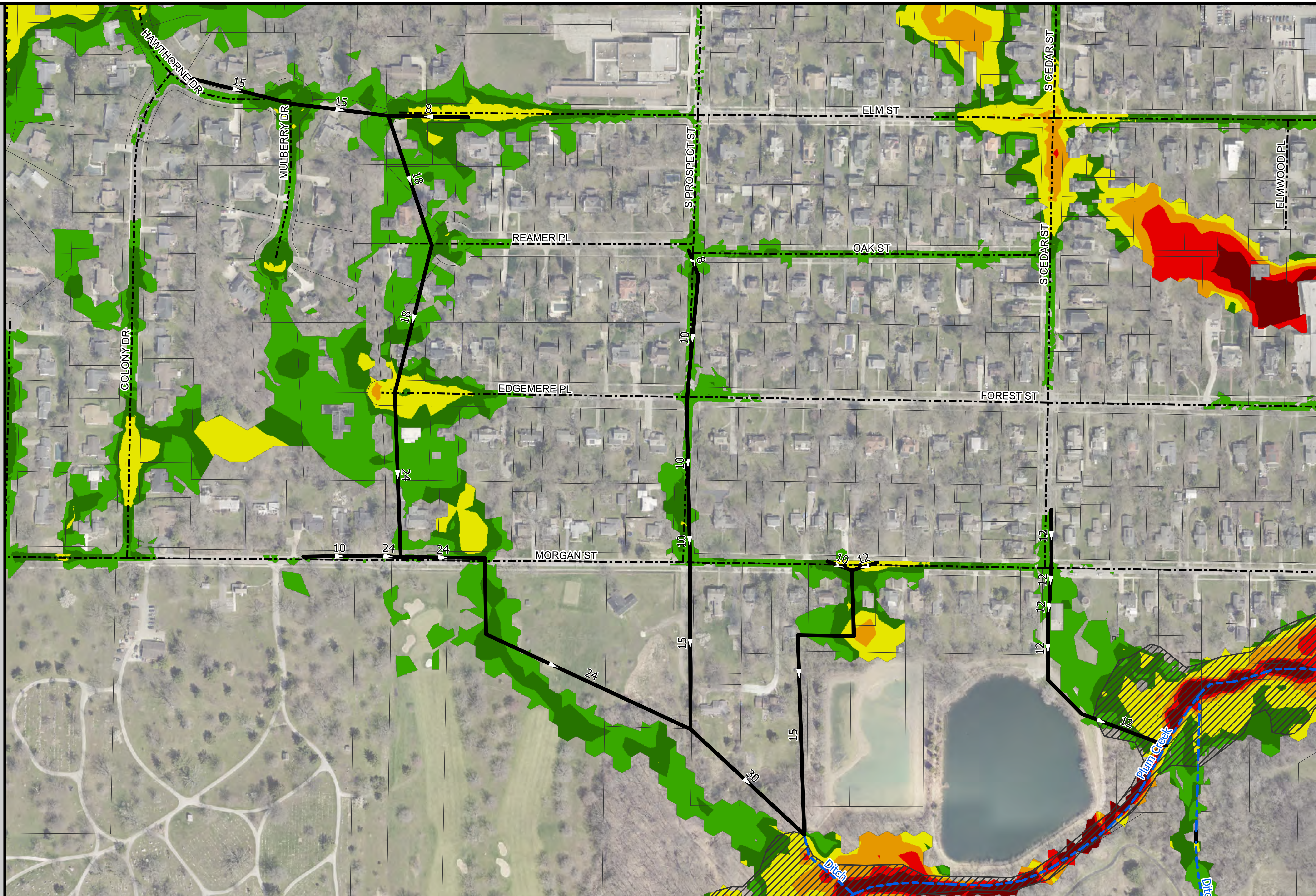
| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP COLONY DRIVE - MORGAN STREET | DESIGN STORM | 0 75 150 300 450 Feet | | 1 / 14 |
|---|---|---|---|---|---|
| 03/12/2026 | | 50-YEAR | | | |

**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

50-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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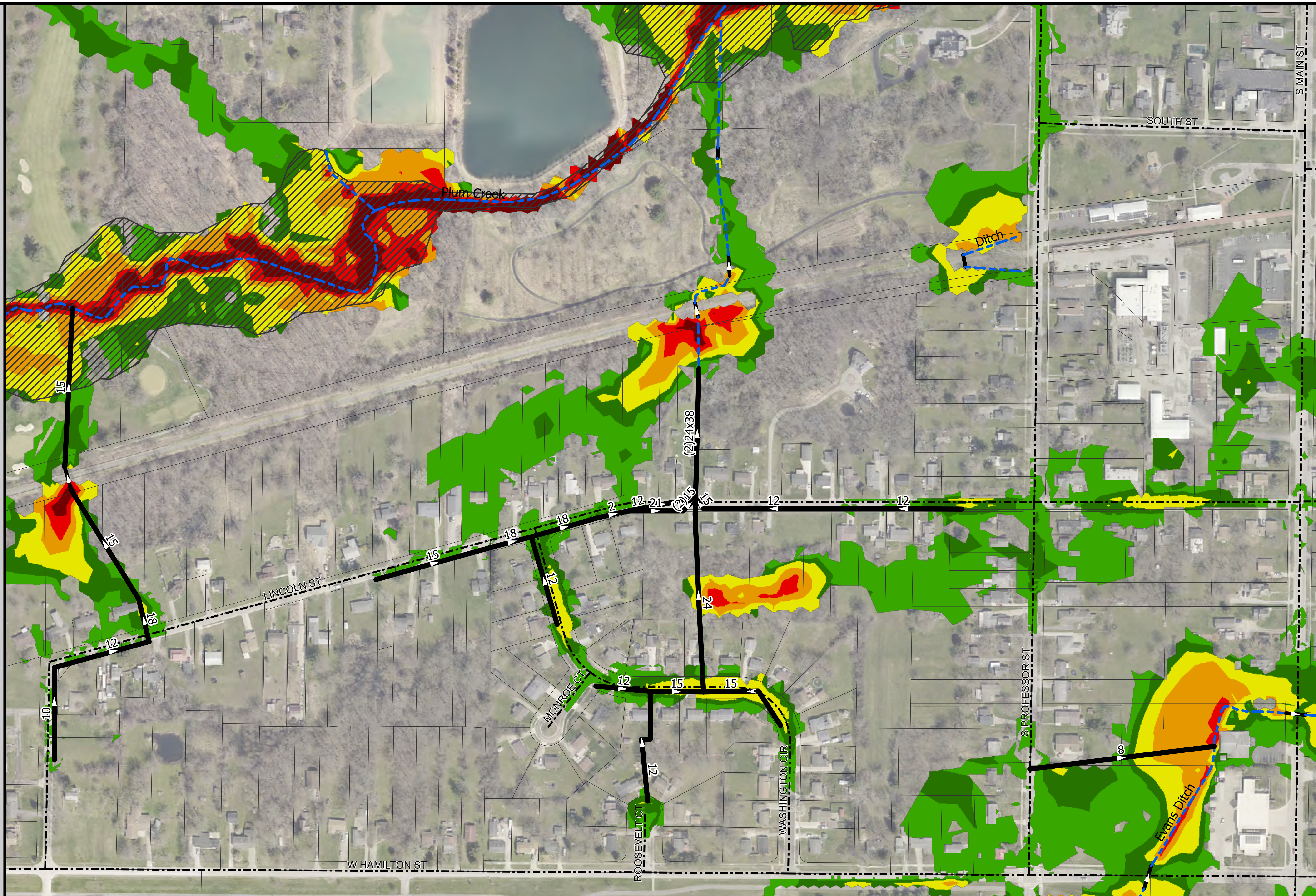
| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP<br>SOUTH PROSPECT STREET | DESIGN STORM | | | 2 / 14 |
|---|---|---|---|---|---|
| 03/12/2026 | | 50-YEAR | 0 50 100 200 300 Feet | | |

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

50-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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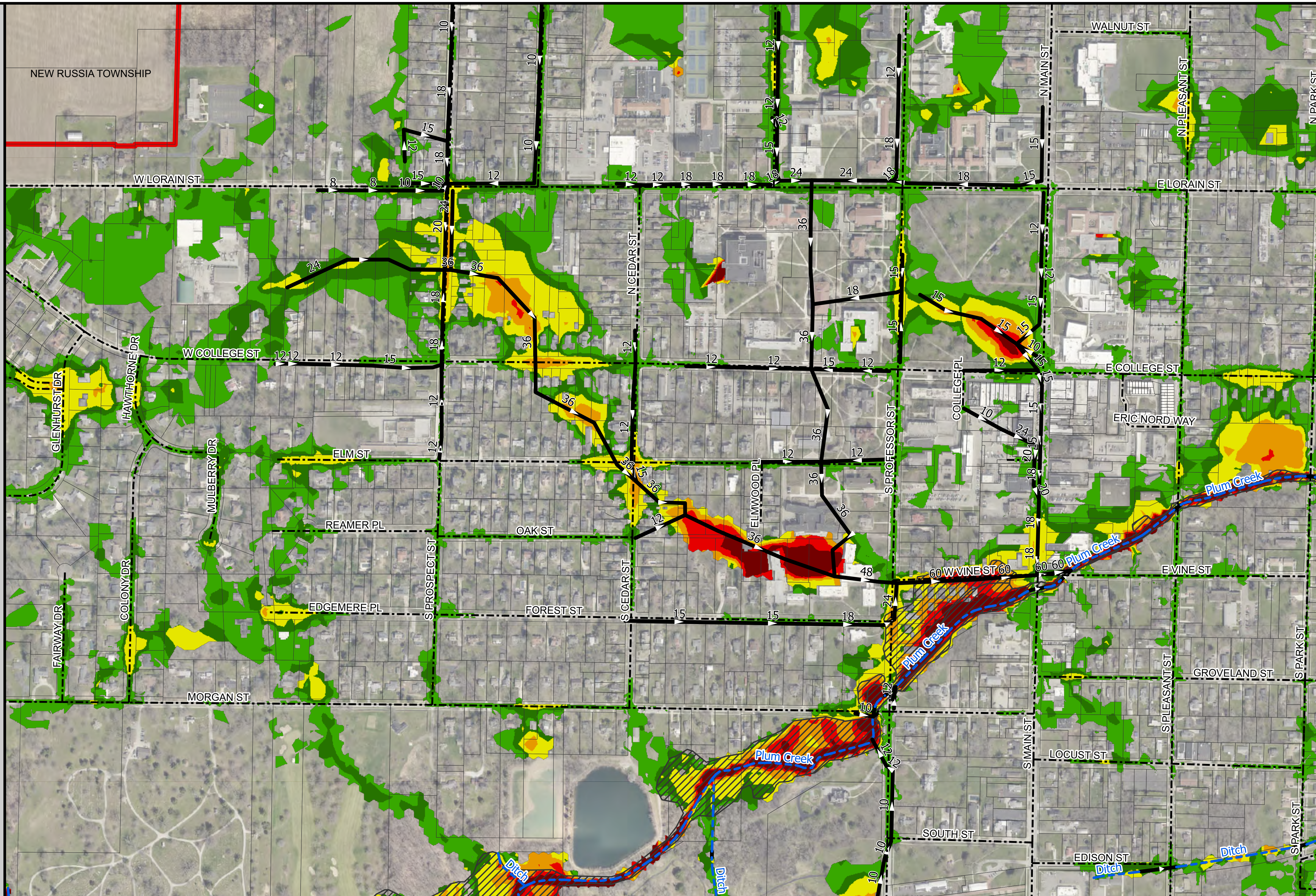
| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP<br>LINCOLN STREET | DESIGN STORM | 0 50 100 200 300 Feet | 3 / 14 |
|---|---|---|---|---|
| 03/12/2026 | | 50-YEAR | | |

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

50-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
WEST VINE STREET

DESIGN STORM

50-YEAR

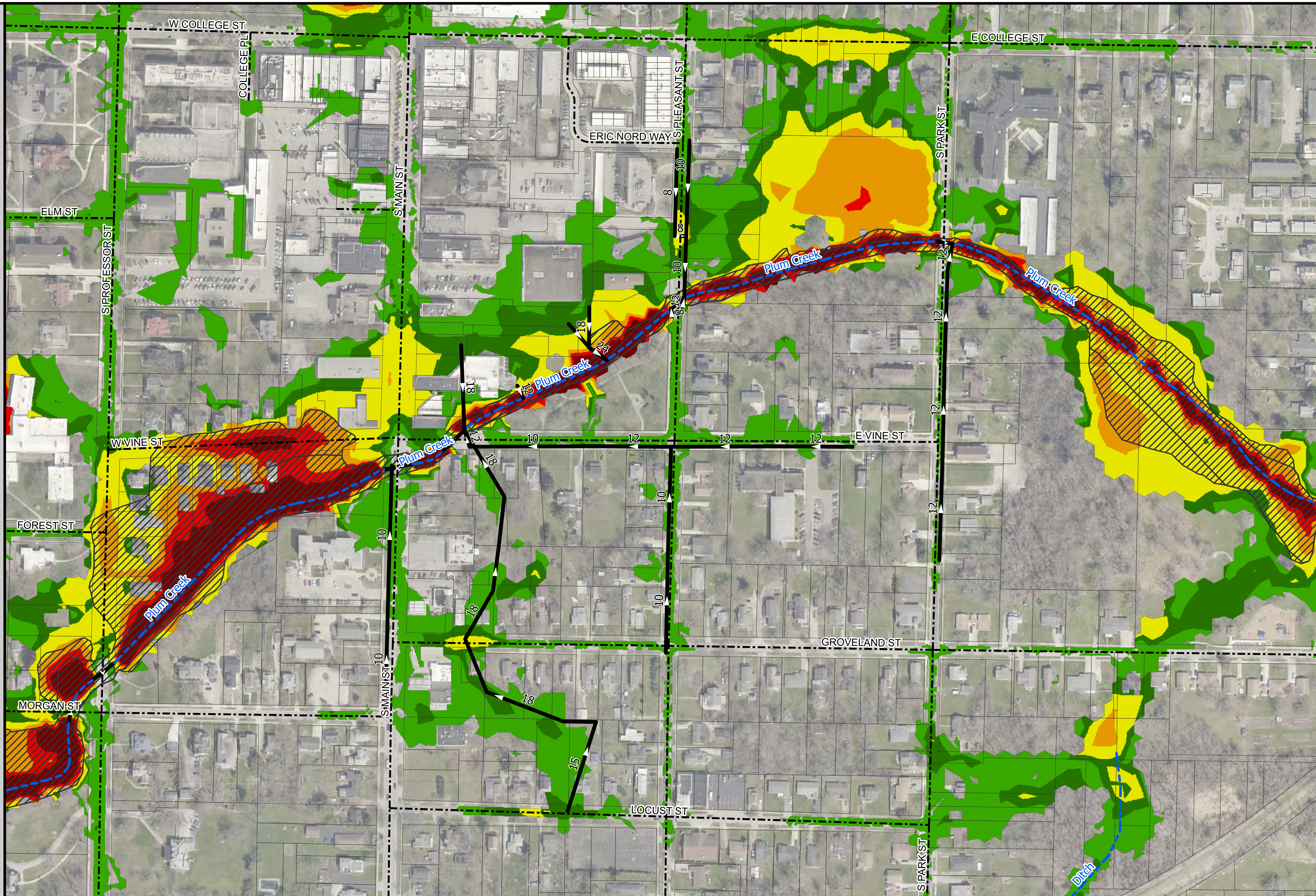
0 90 180 360 540
Feet

**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

50-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
EAST VINE STREET - SOUTH PLEASANT STREET

DESIGN STORM

50-YEAR

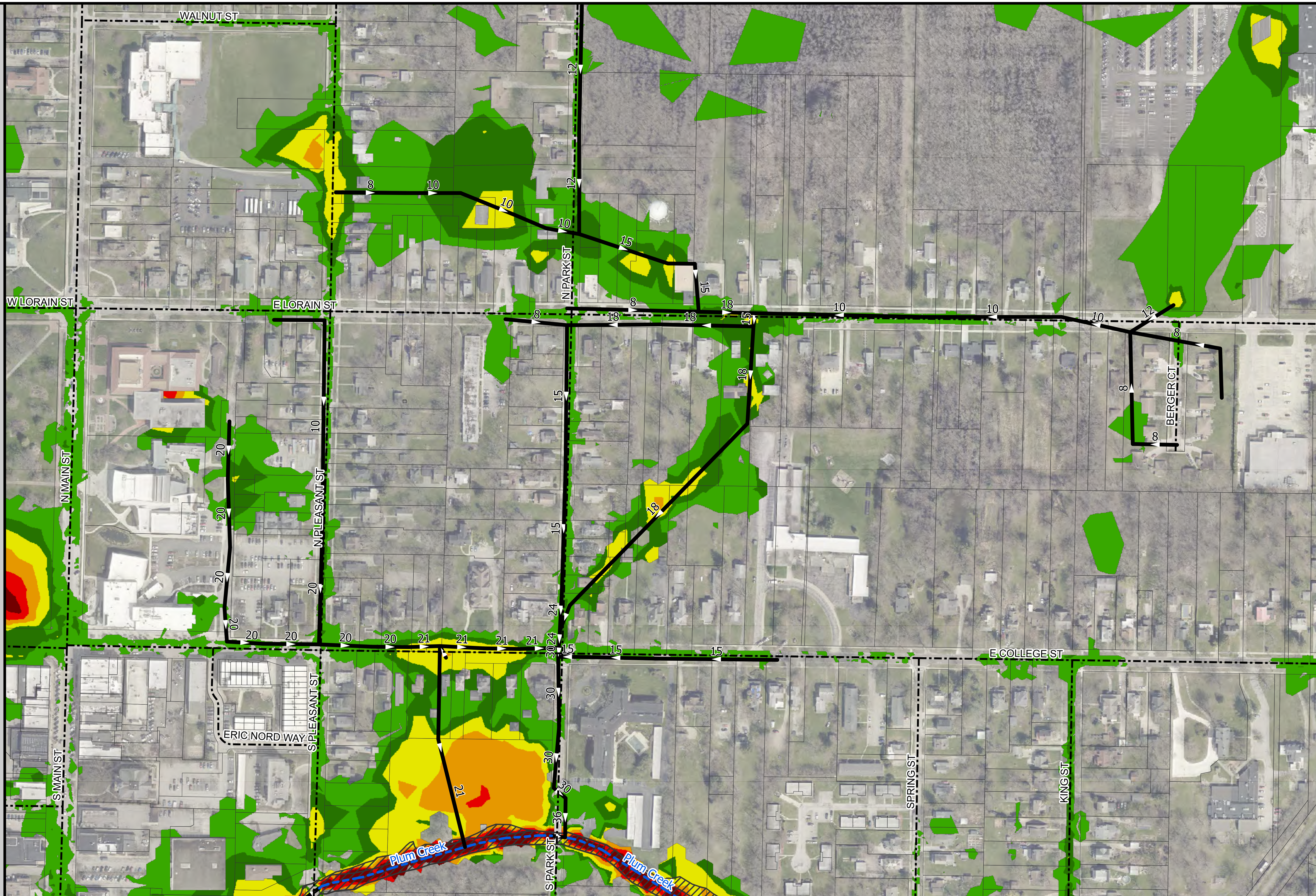
0 45 90 180 270 Feet

**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

50-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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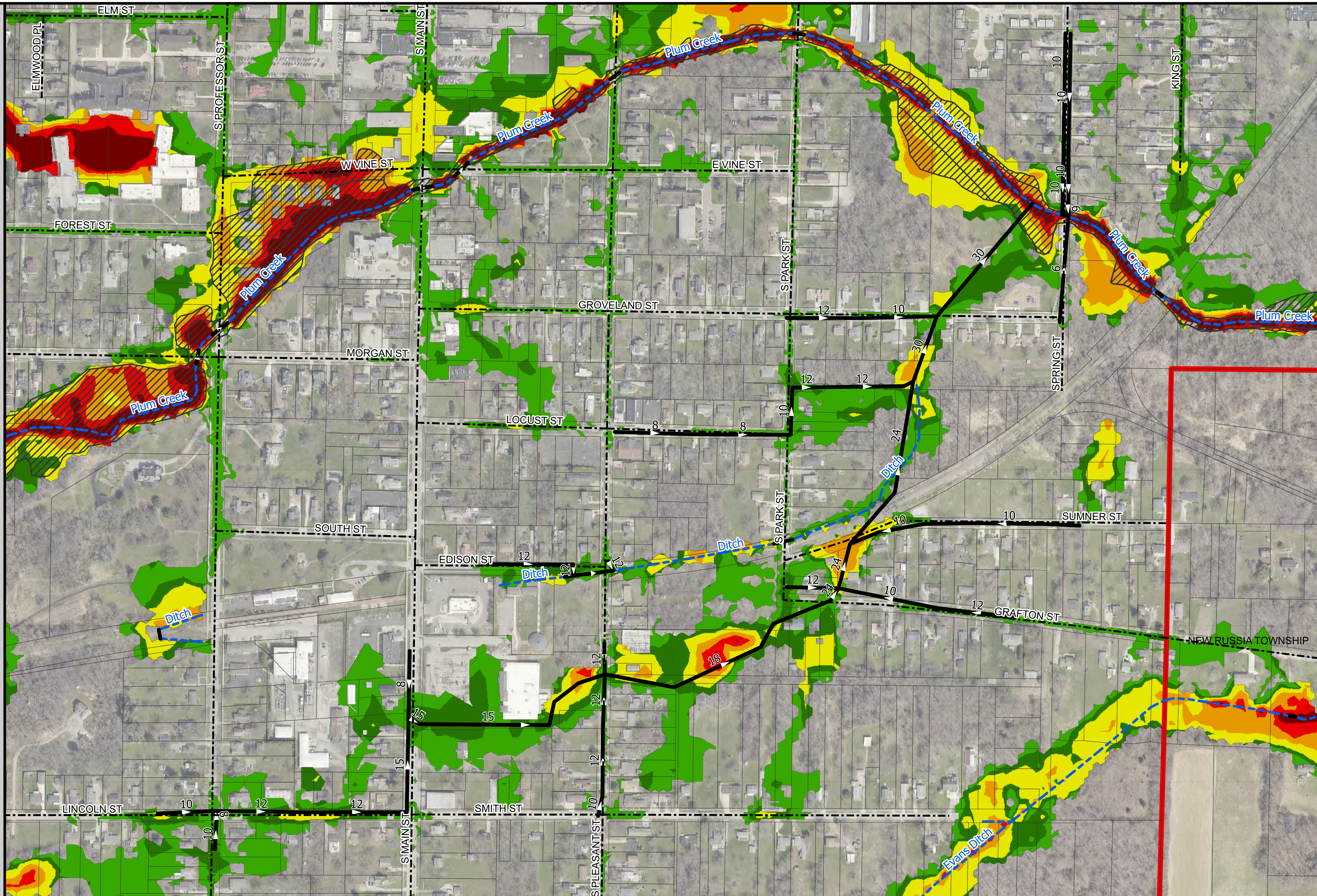
| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP<br>NORTH / SOUTH PARK STREET | DESIGN STORM | 0 50 100 200 300 Feet | 6 / 14 |
|---|---|---|---|---|
| 03/12/2026 | | 50-YEAR | | |

**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

50-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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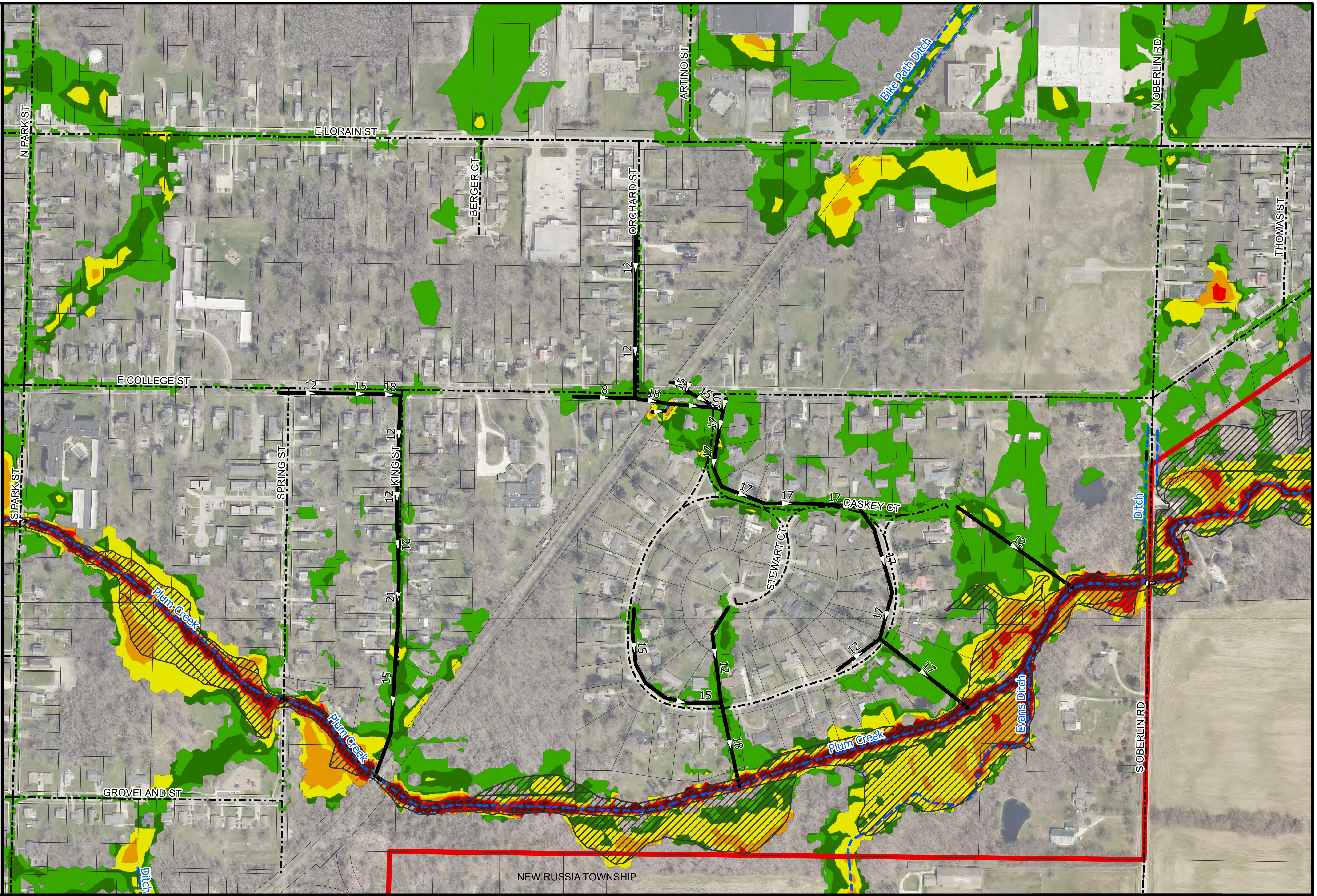
| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP<br>SOUTH PARK STREET - GROVELAND STREET | DESIGN STORM | 0 65 130 260 390 Feet | 7 / 14 |
|---|---|---|---|---|
| 03/12/2026 | | 50-YEAR | | |

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

50-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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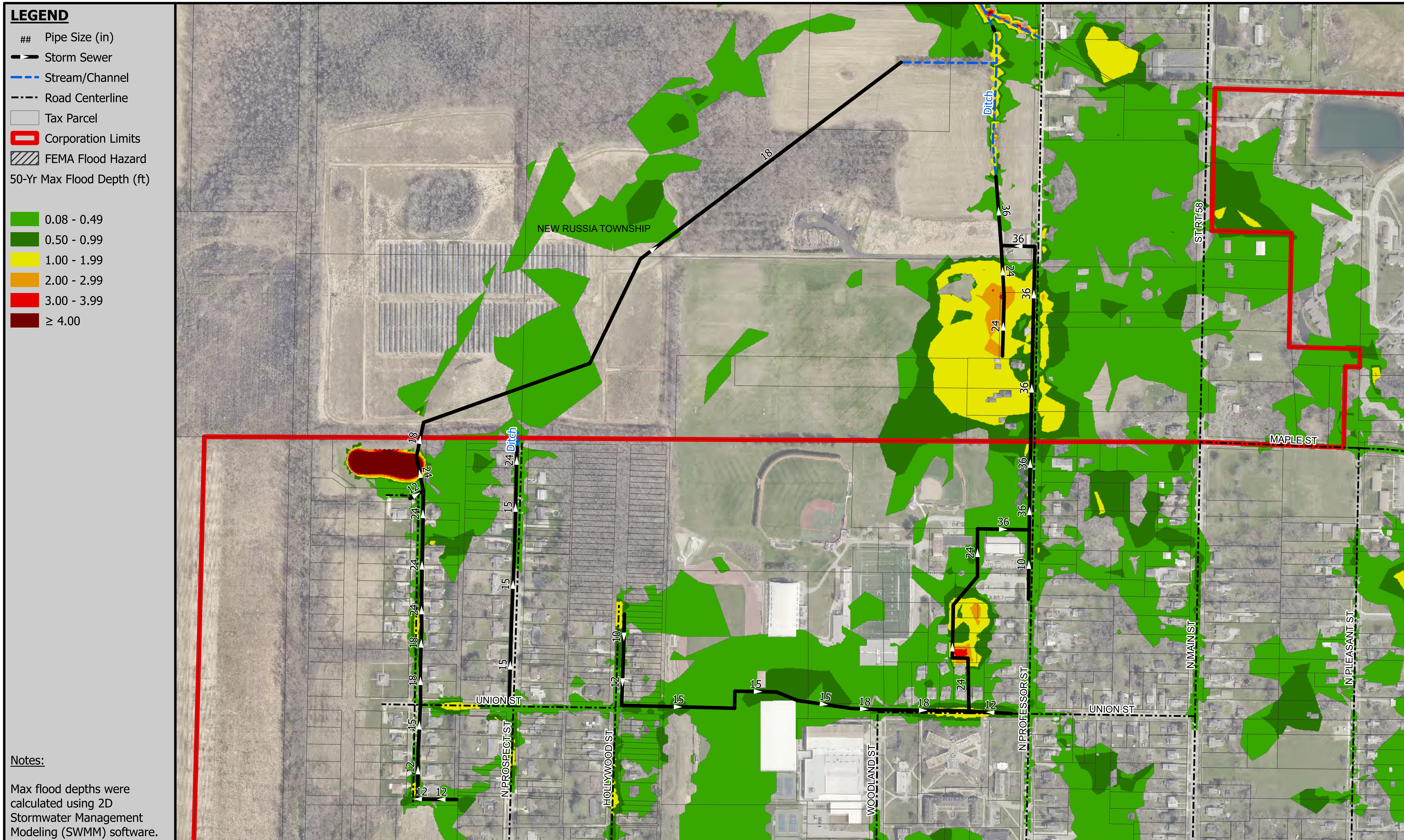
| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP<br>KING STREET - SHIPHERD CIRCLE | DESIGN STORM |
|---|---|---|
| 03/12/2026 | | 50-YEAR |

0 65 130 260 390 Feet

8 / 14




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
NORTH PROFESSOR STREET

DESIGN STORM

50-YEAR

0 75 150 300 450
Feet

**LEGEND**

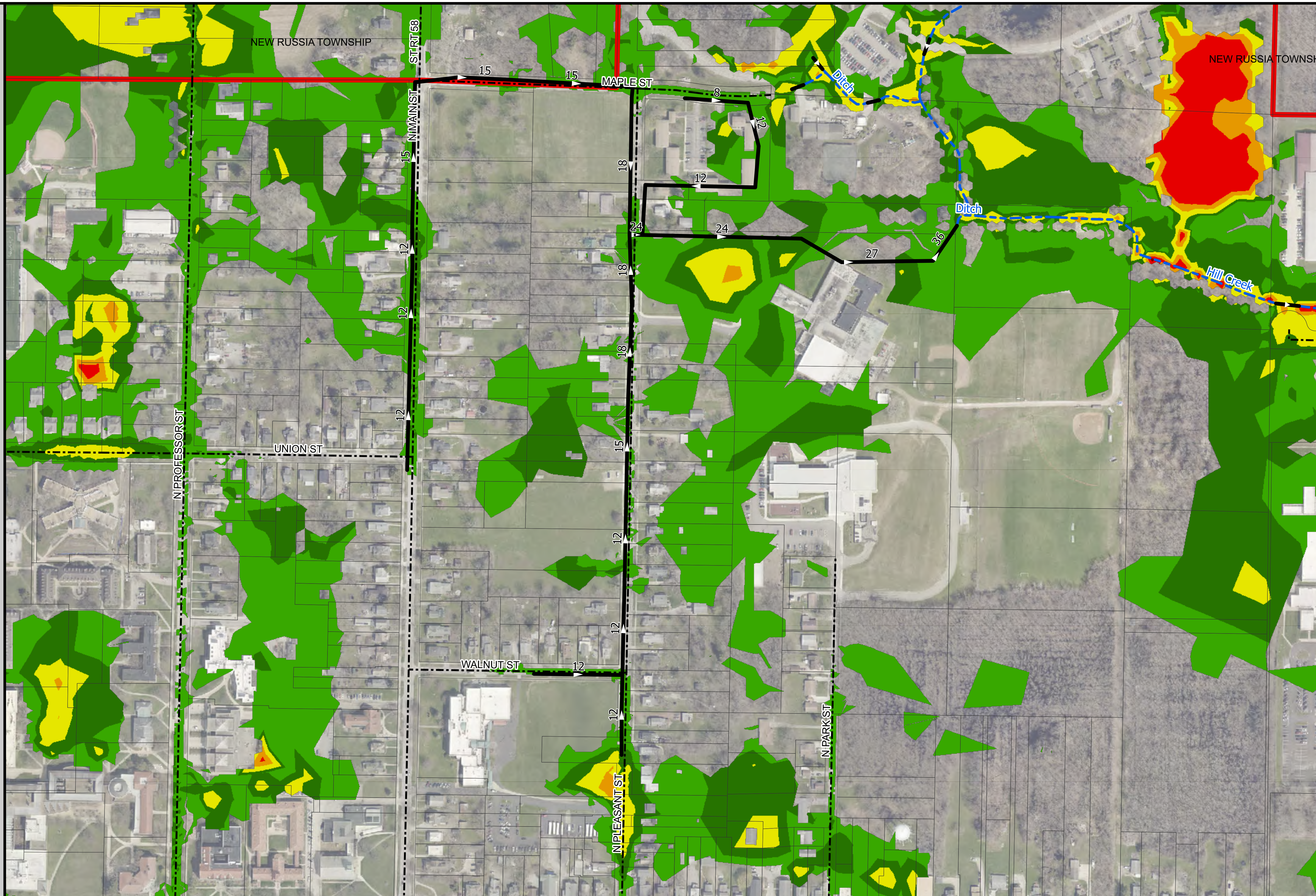
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

50-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
MAPLE STREET

DESIGN STORM

50-YEAR

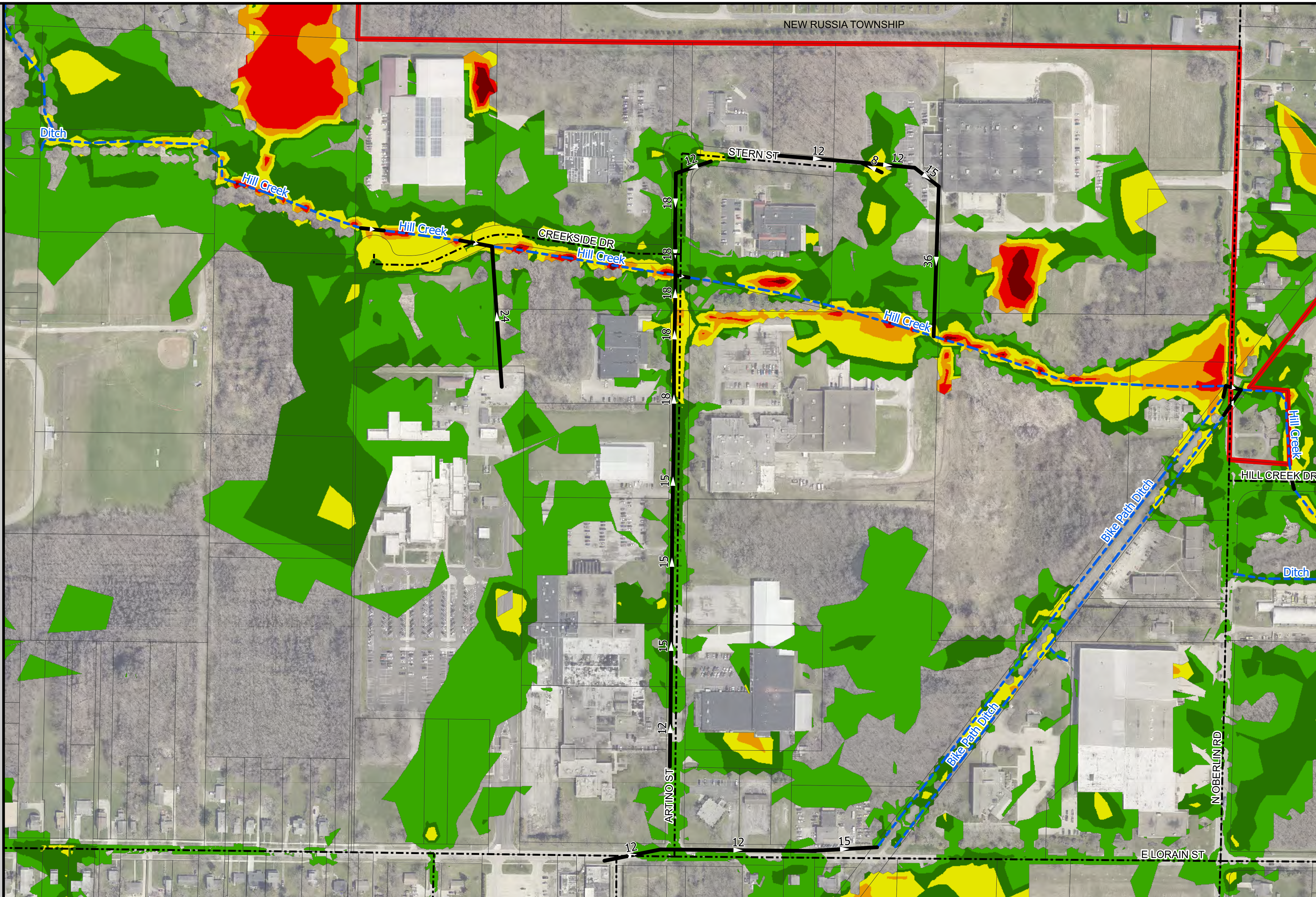
0 55 110 220 330
Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

50-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

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FLOOD RASTER MAP
ARTINO STREET

DESIGN STORM

50-YEAR

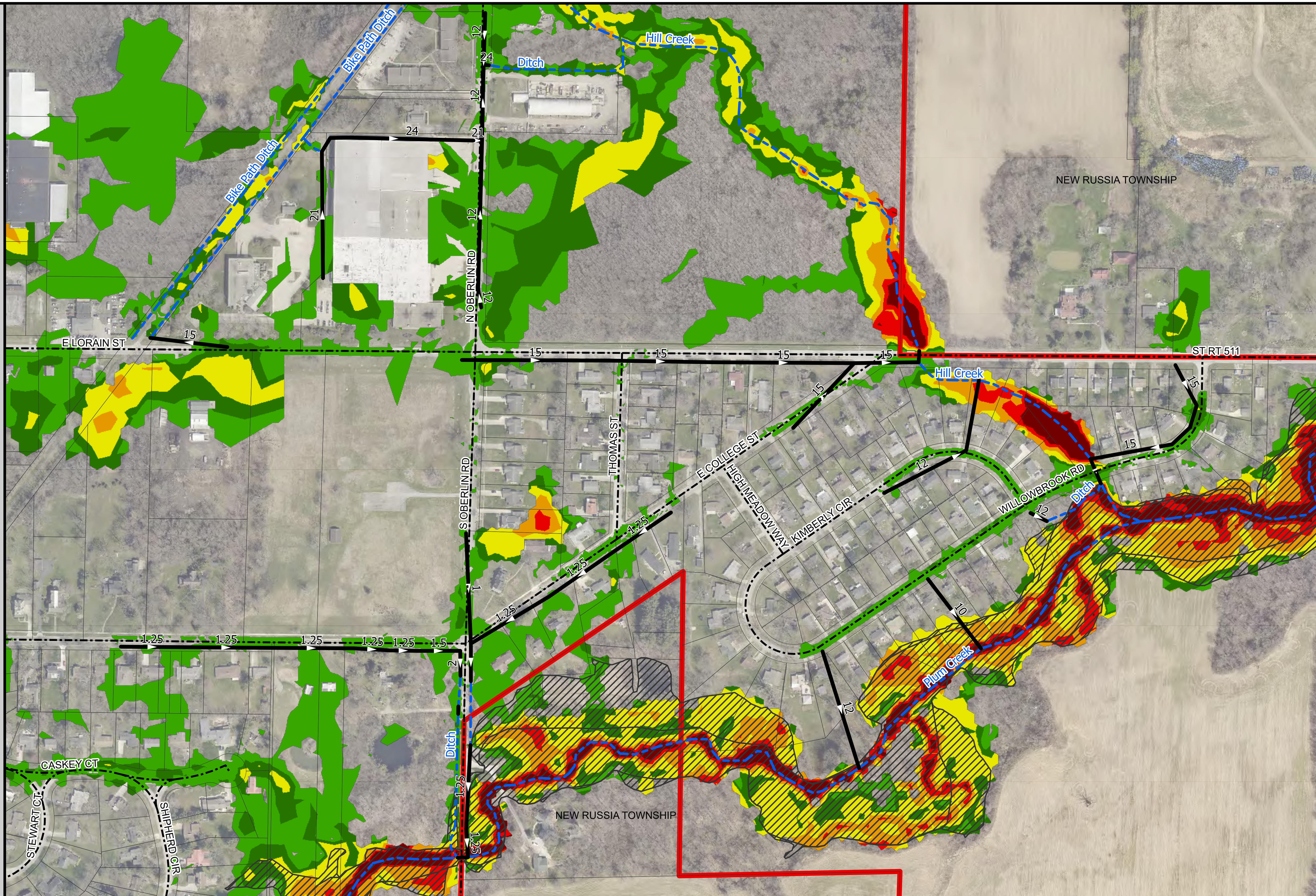
0 55 110 220 330 Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

50-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

| KEM K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS | CITY OF OBERLIN | STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP NORTH OBERLIN ROAD - EAST LORAIN STREET | DESIGN STORM | 0 55 110 220 330 Feet | | 12 / 14 |
|---|---|---|---|---|---|---|---|
| | | 03/12/2026 | | 50-YEAR | | | |

## LEGEND

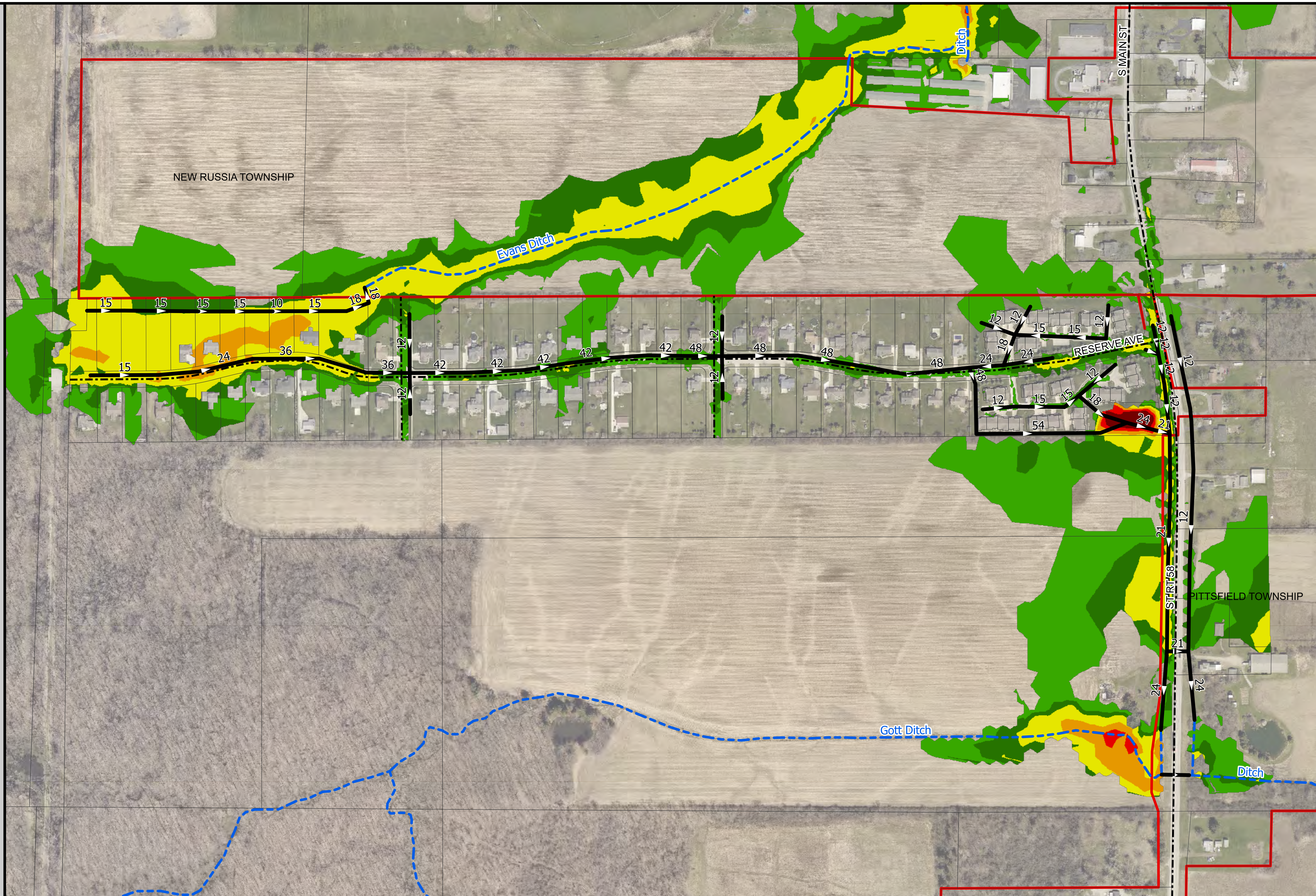
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

50-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.




| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP<br>RESERVE AVENUE | DESIGN STORM |
|---|---|---|
| 03/12/2026 | | 50-YEAR |

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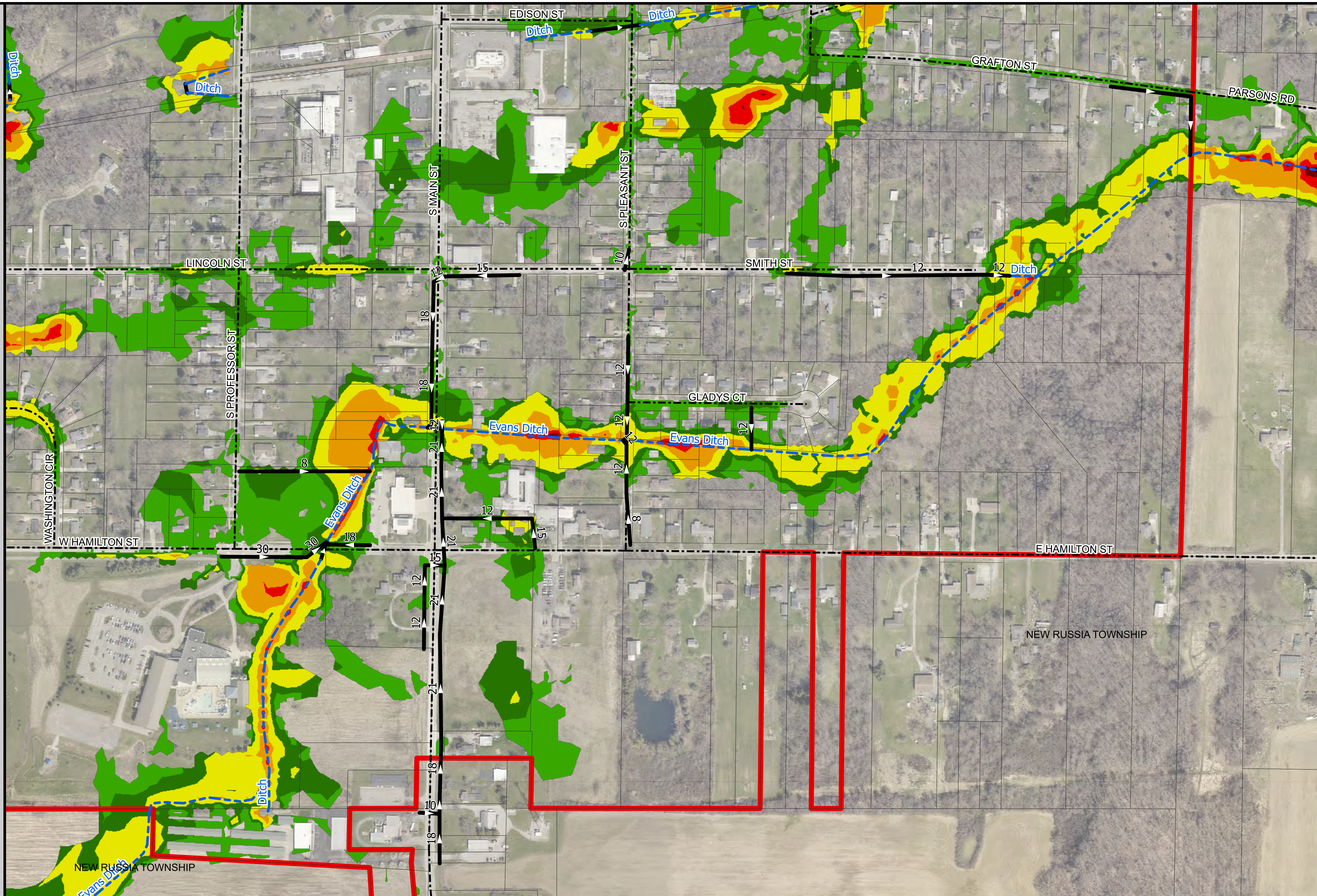
**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

50-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP SOUTH MAIN STREET | DESIGN STORM |
|---|---|---|
| 03/12/2026 | | 50-YEAR |

0 65 130 260 390 Feet

# Appendix D-04

# 100 Year Design Storm

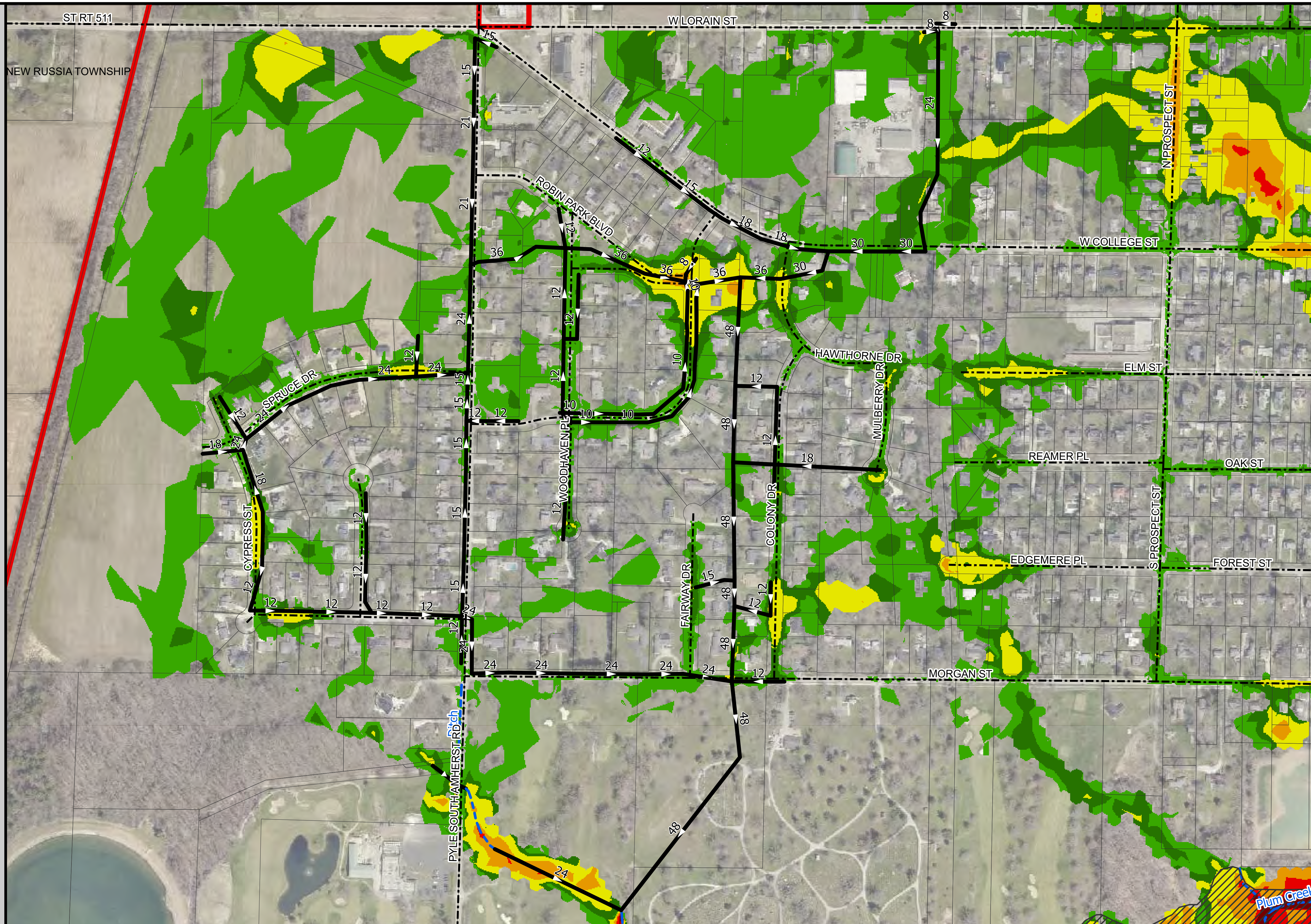
# Flood Raster Maps

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

100-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP COLONY - MORGAN | DESIGN STORM | 0 75 150 300 450 Feet | 1 / 14 |
| --- | --- | --- | --- | --- |
| 03/12/2026 | | 100-YEAR | | |

**LEGEND**

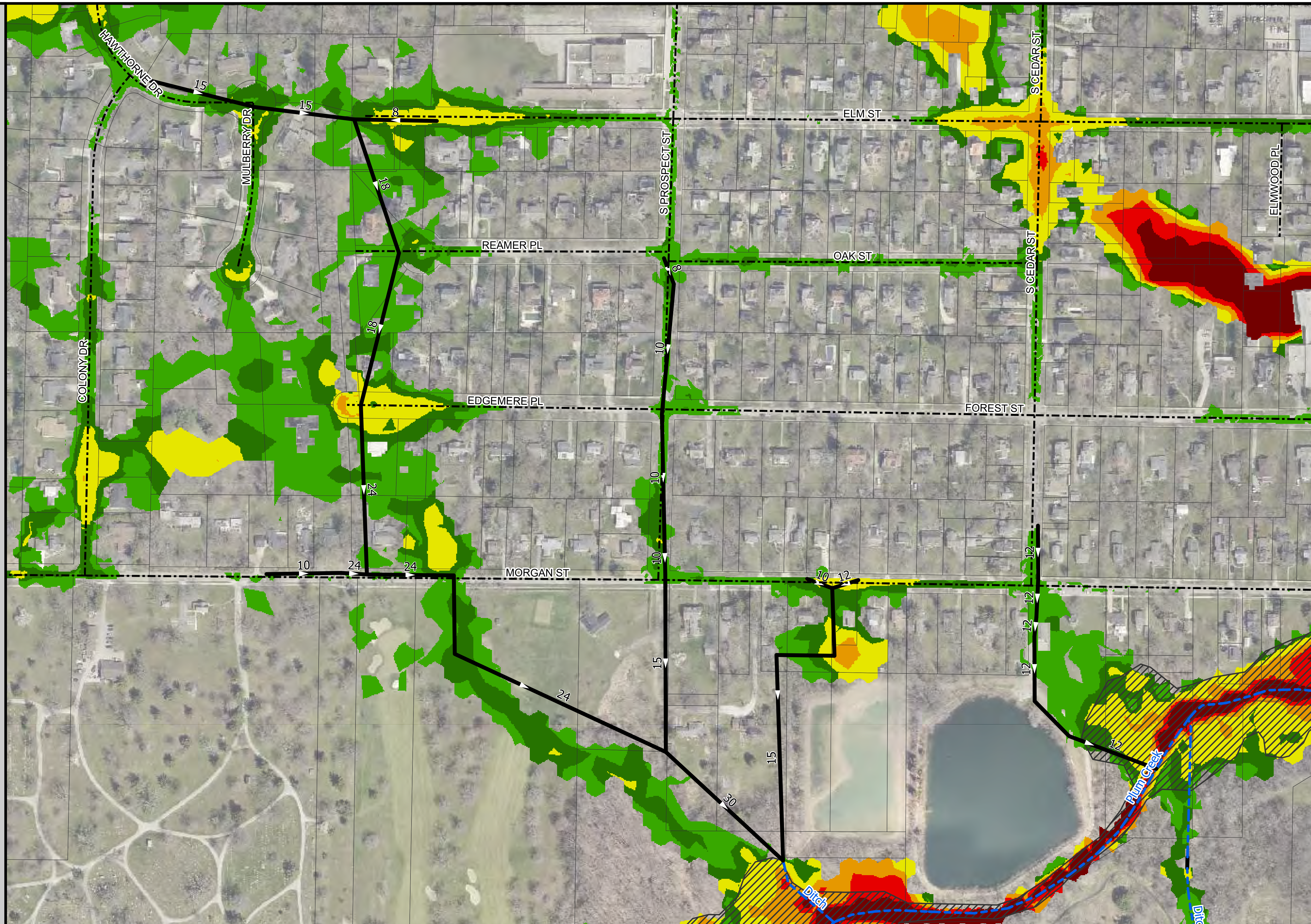
| | |
|---|---|
| ## | Pipe Size (in) |
| | Storm Sewer |
| | Stream/Channel |
| | Road Centerline |
| | Tax Parcel |
| | Corporation Limits |
| | FEMA Flood Hazard |

100-Yr Max Flood Depth (ft)

| | |
|---|---|
| | 0.08 - 0.49 |
| | 0.50 - 0.99 |
| | 1.00 - 1.99 |
| | 2.00 - 2.99 |
| | 3.00 - 3.99 |
| | ≥ 4.00 |

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
SOUTH PROSPECT

DESIGN STORM

100-YEAR

0 50 100 200 300 Feet

## LEGEND

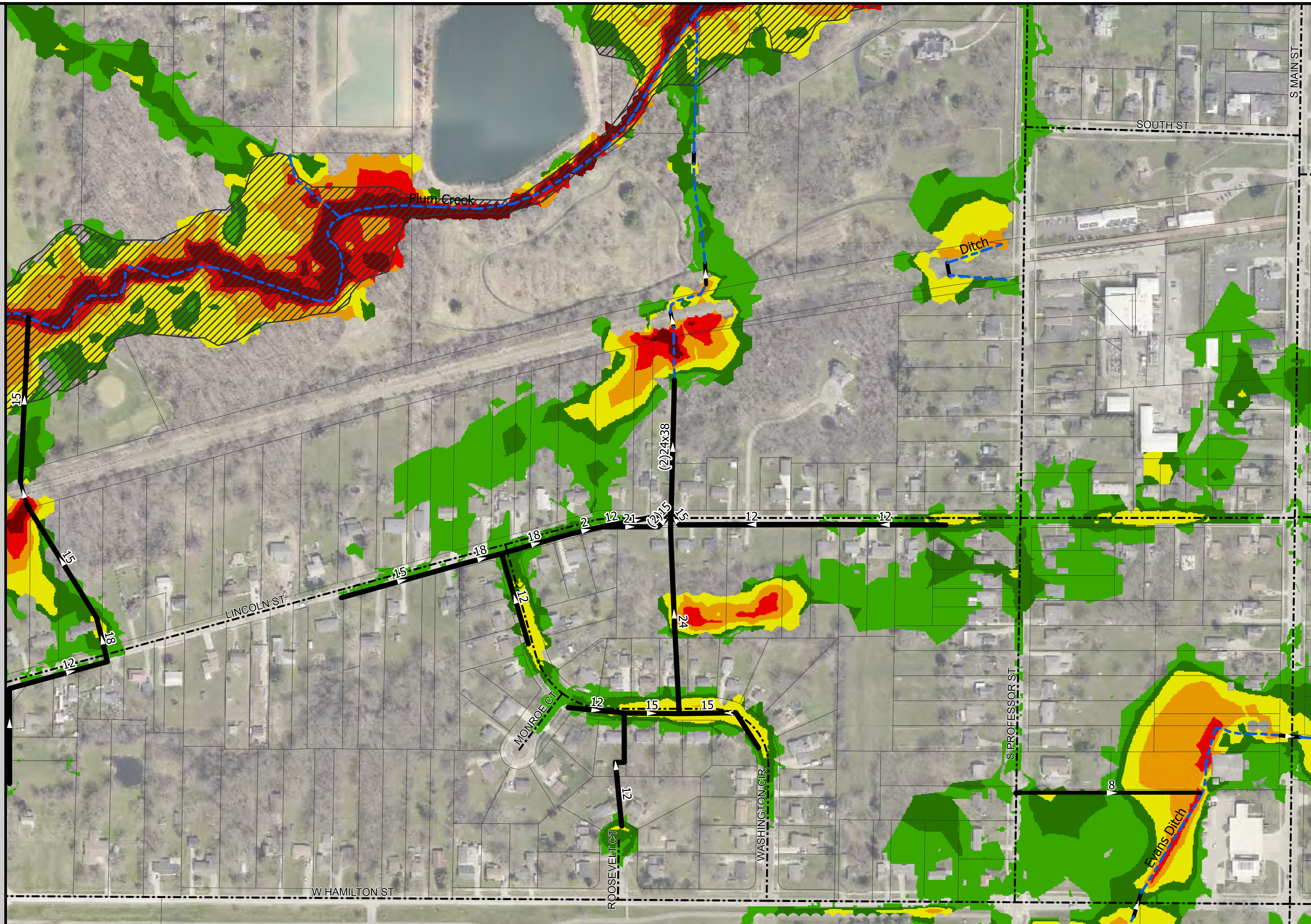
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

100-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.




| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP<br>LINCOLN | DESIGN STORM | 3 / 14 |
|---|---|---|---|
| 03/12/2026 | | 100-YEAR | |

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0 50 100 200 300
Feet

## LEGEND

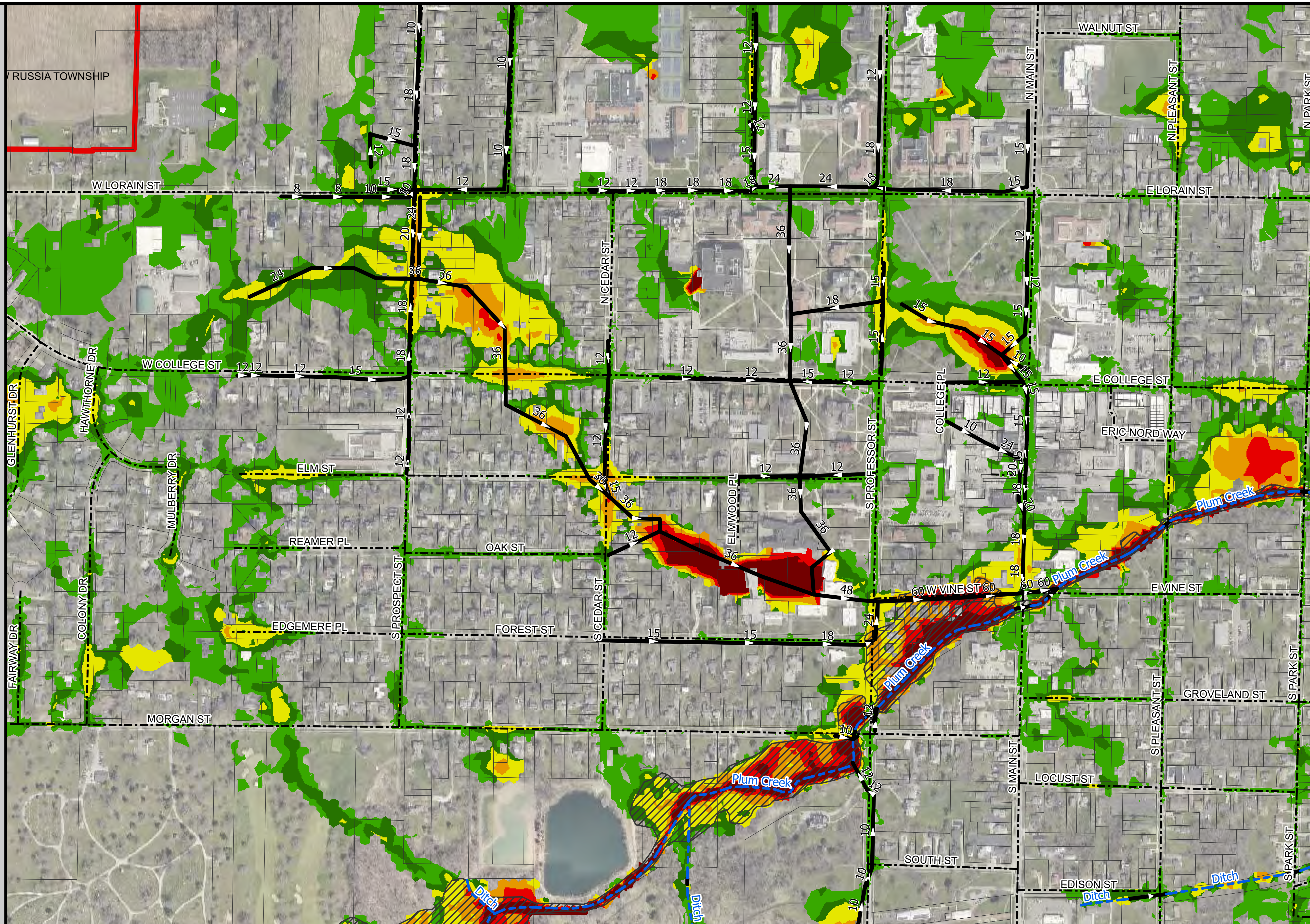
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

100-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.



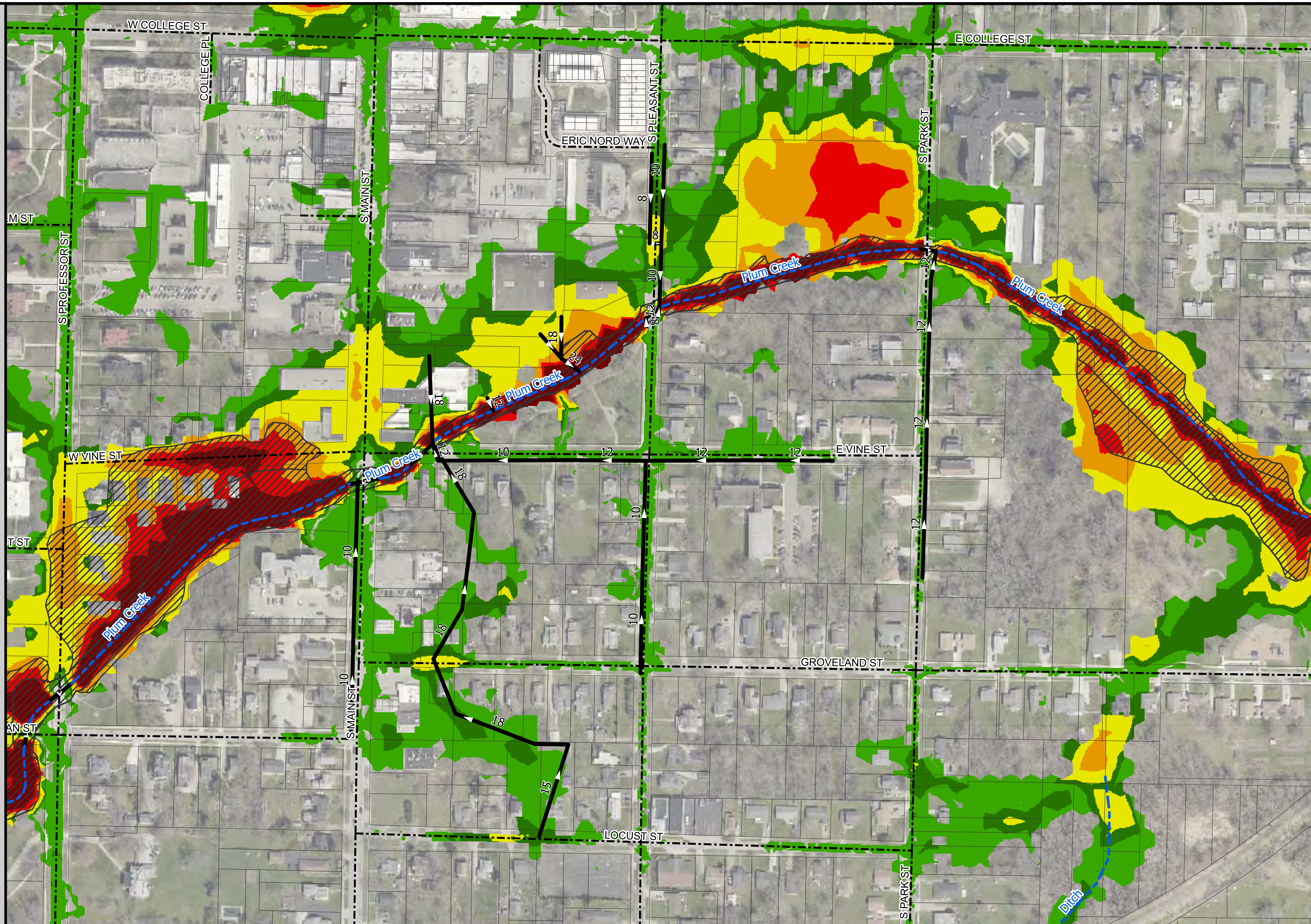

| K.E. McCARTNEY & ASSOCIATES — ENGINEERS • PLANNERS • SURVEYORS | CITY OF OBERLIN | STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP WEST VINE | DESIGN STORM | 0 90 180 360 540 Feet | | 4 / 14 |
|---|---|---|---|---|---|---|---|
| | | 03/12/2026 | | 100-YEAR | | | |

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

100-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
EAST VINE - SOUTH PLEASANT

DESIGN STORM

100-YEAR

0 45 90 180 270 Feet

**LEGEND**

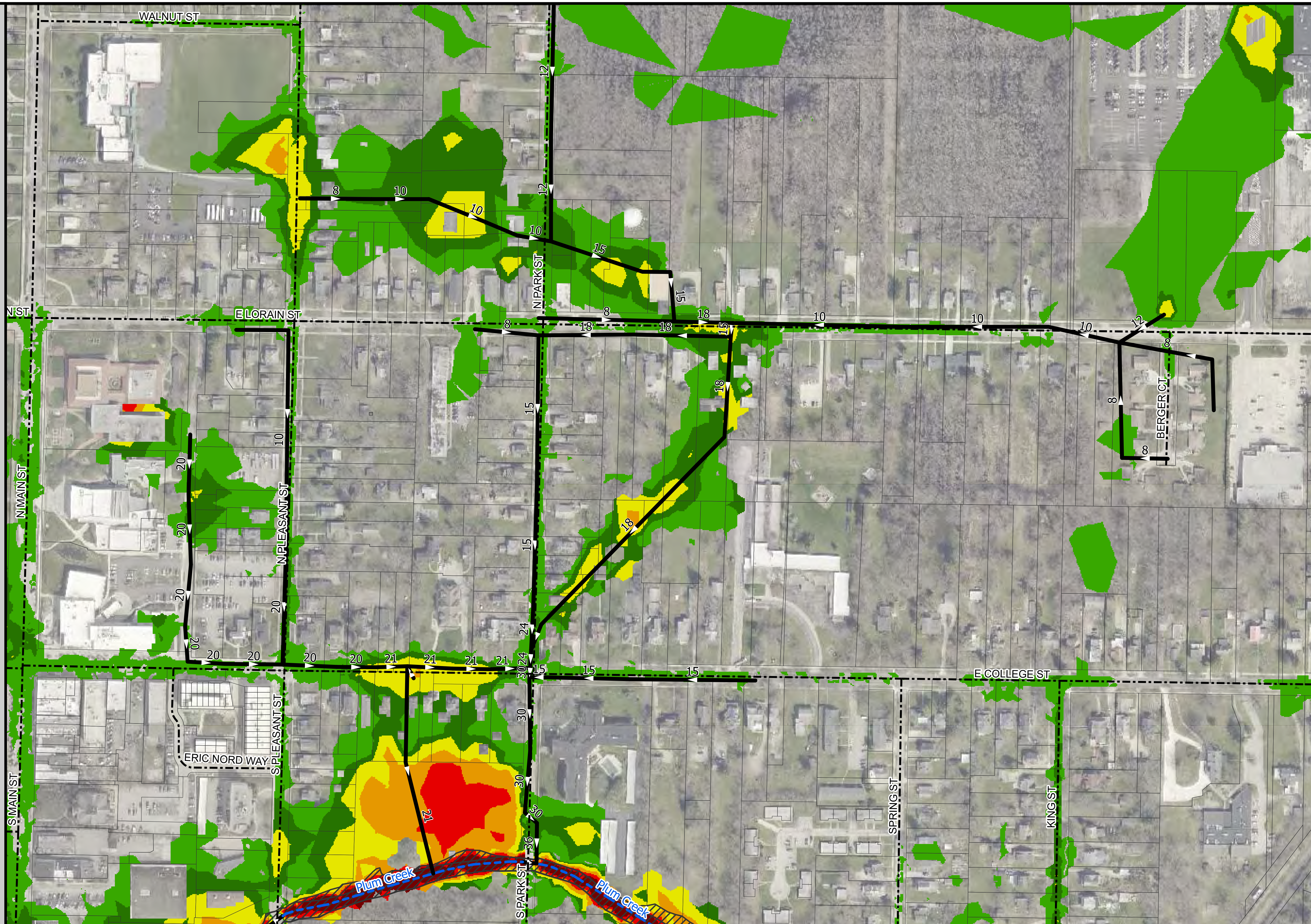
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

100-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.



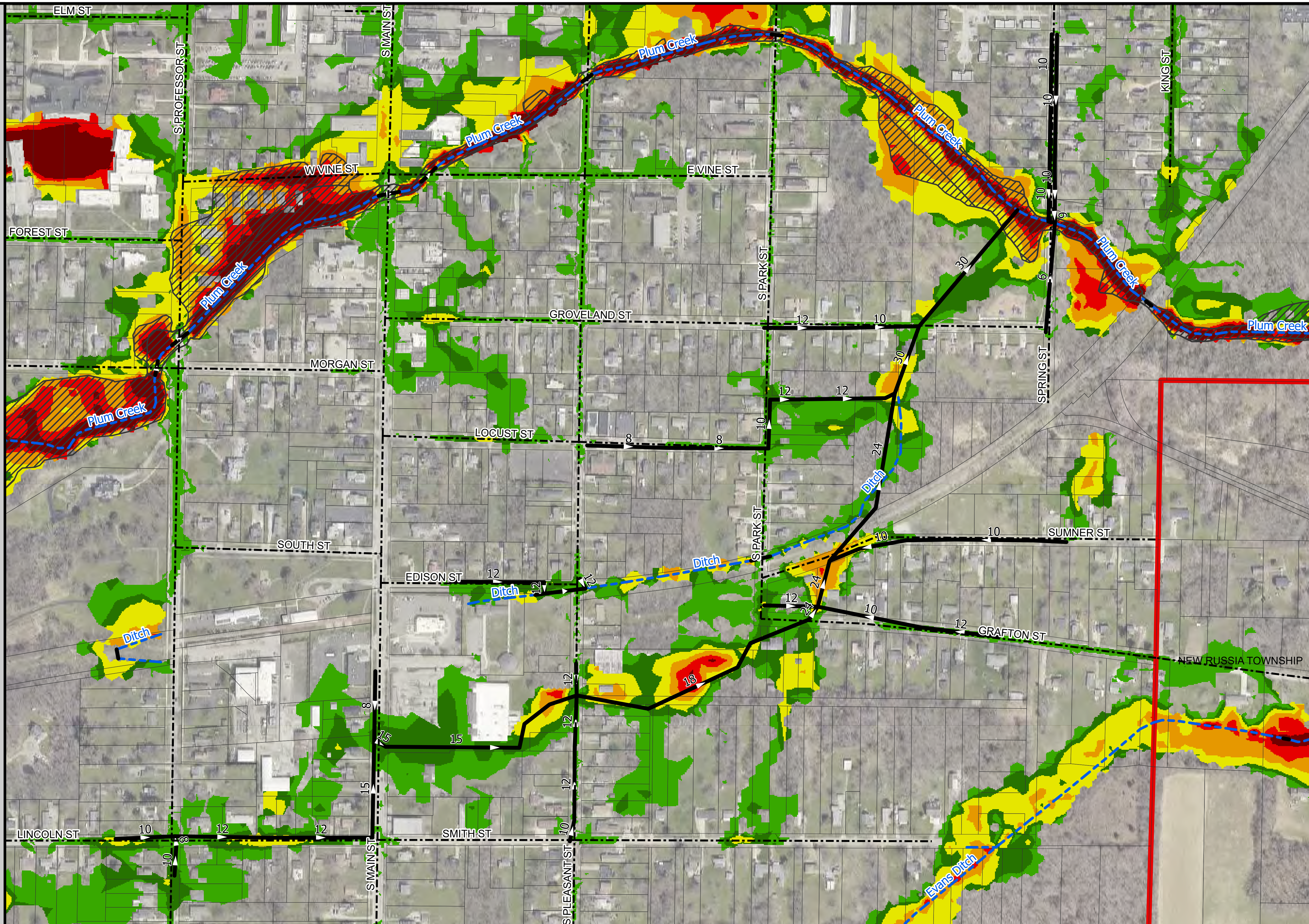

| | | | | | |
|---|---|---|---|---|---|
| KEM K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS | CITY OF OBERLIN | STORMWATER STRATEGIC PLAN<br>03/12/2026 | FLOOD RASTER MAP<br>NORTH PARK - SOUTH PARK | DESIGN STORM<br>100-YEAR | 6 / 14 |

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

100-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
SOUTH PARK - GROVELAND

DESIGN STORM

100-YEAR

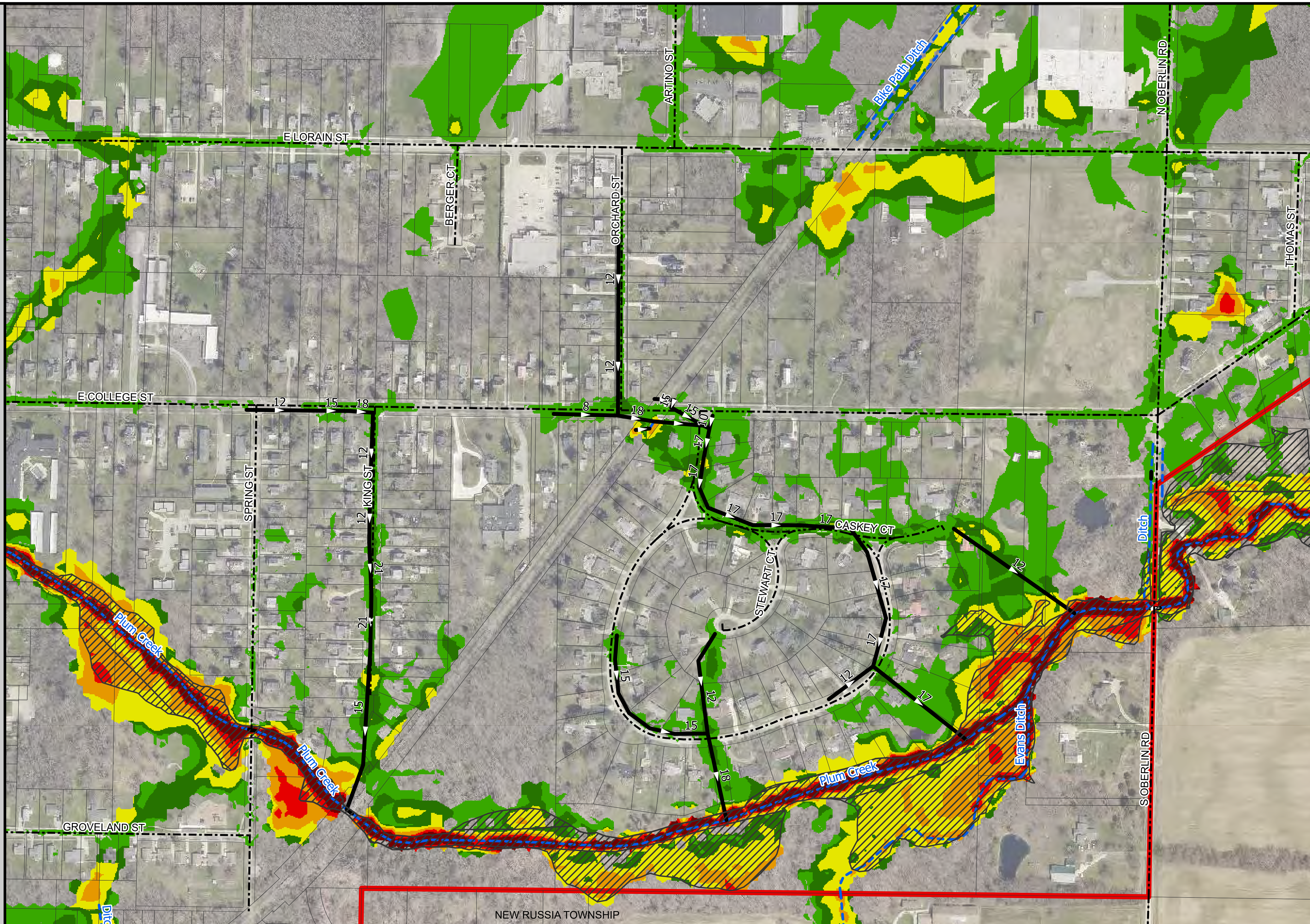
0 65 130 260 390
Feet

**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

100-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

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| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP<br>KING - SHIPHERD | DESIGN STORM |
|---|---|---|
| 03/12/2026 | | 100-YEAR |

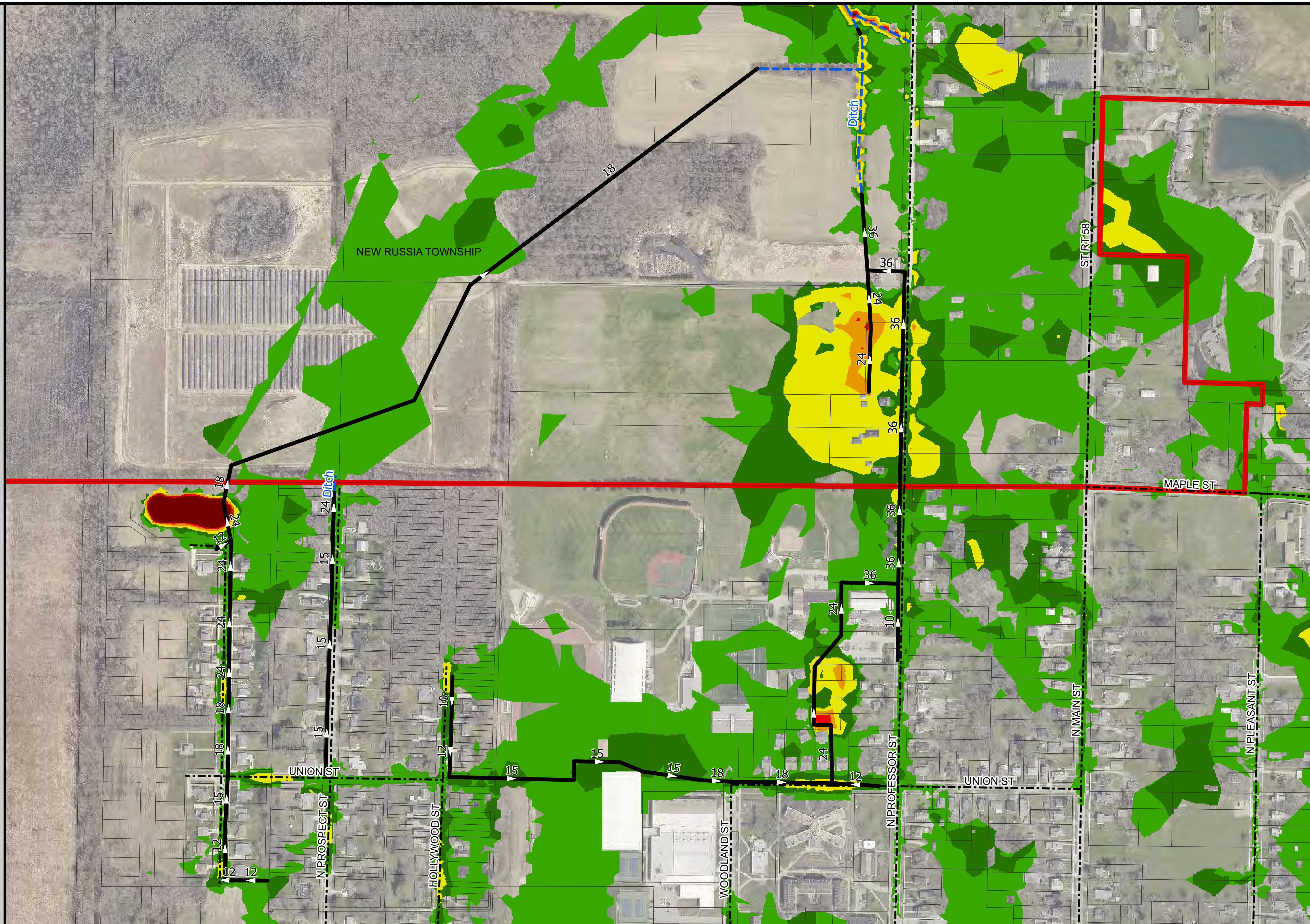
0 65 130 260 390 Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

100-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

KEM K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS

CITY OF OBERLIN

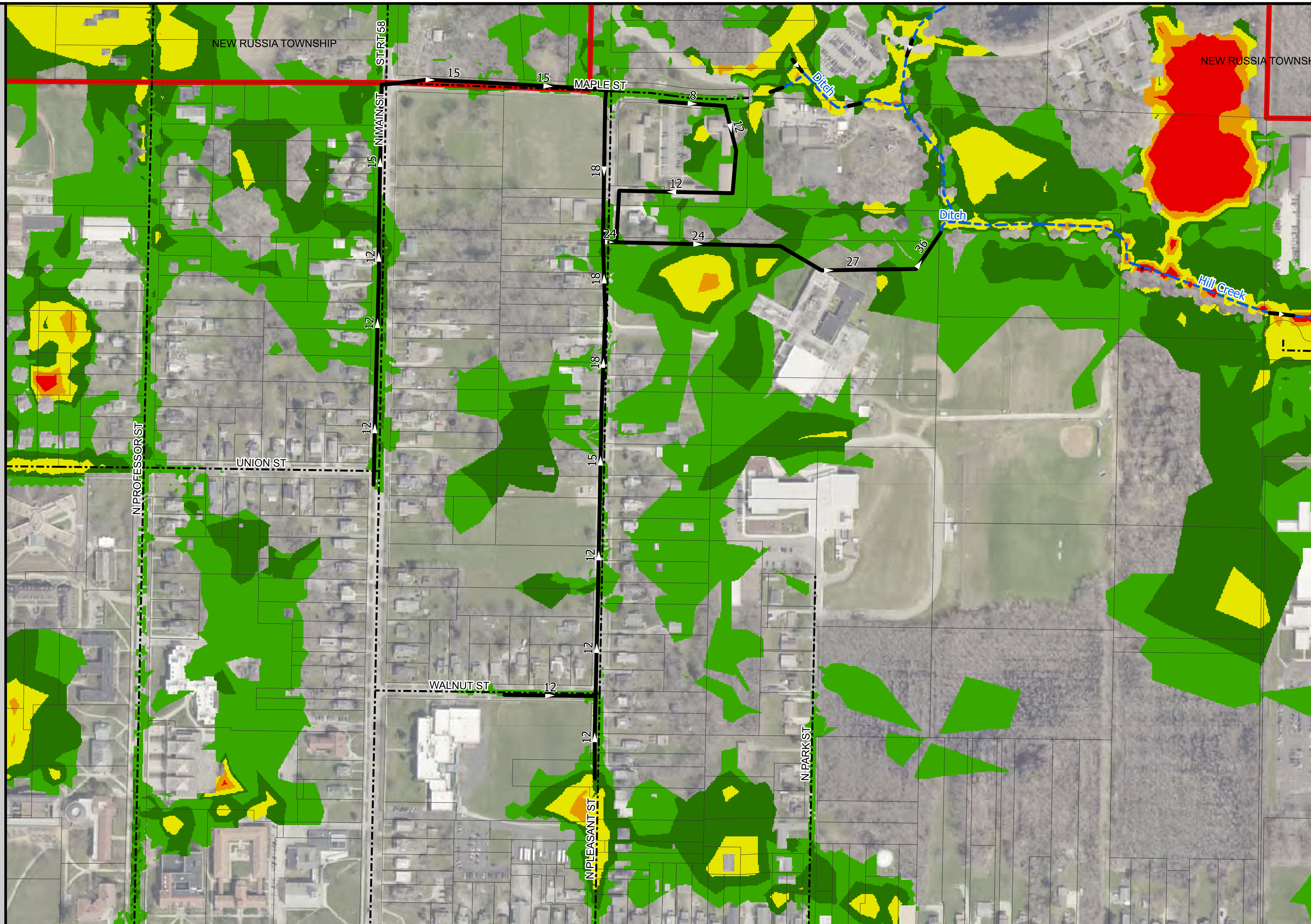
| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP NORTH PROFESSOR | DESIGN STORM | | |
|---|---|---|---|---|
| 03/12/2026 | | 100-YEAR | 0 75 150 300 450 Feet | 9 / 14 |

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

100-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

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KEM K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS

CITY OF OBERLIN

| STORMWATER STRATEGIC PLAN | FLOOD RASTER MAP MAPLE | DESIGN STORM |
|---|---|---|
| 03/12/2026 | | 100-YEAR |

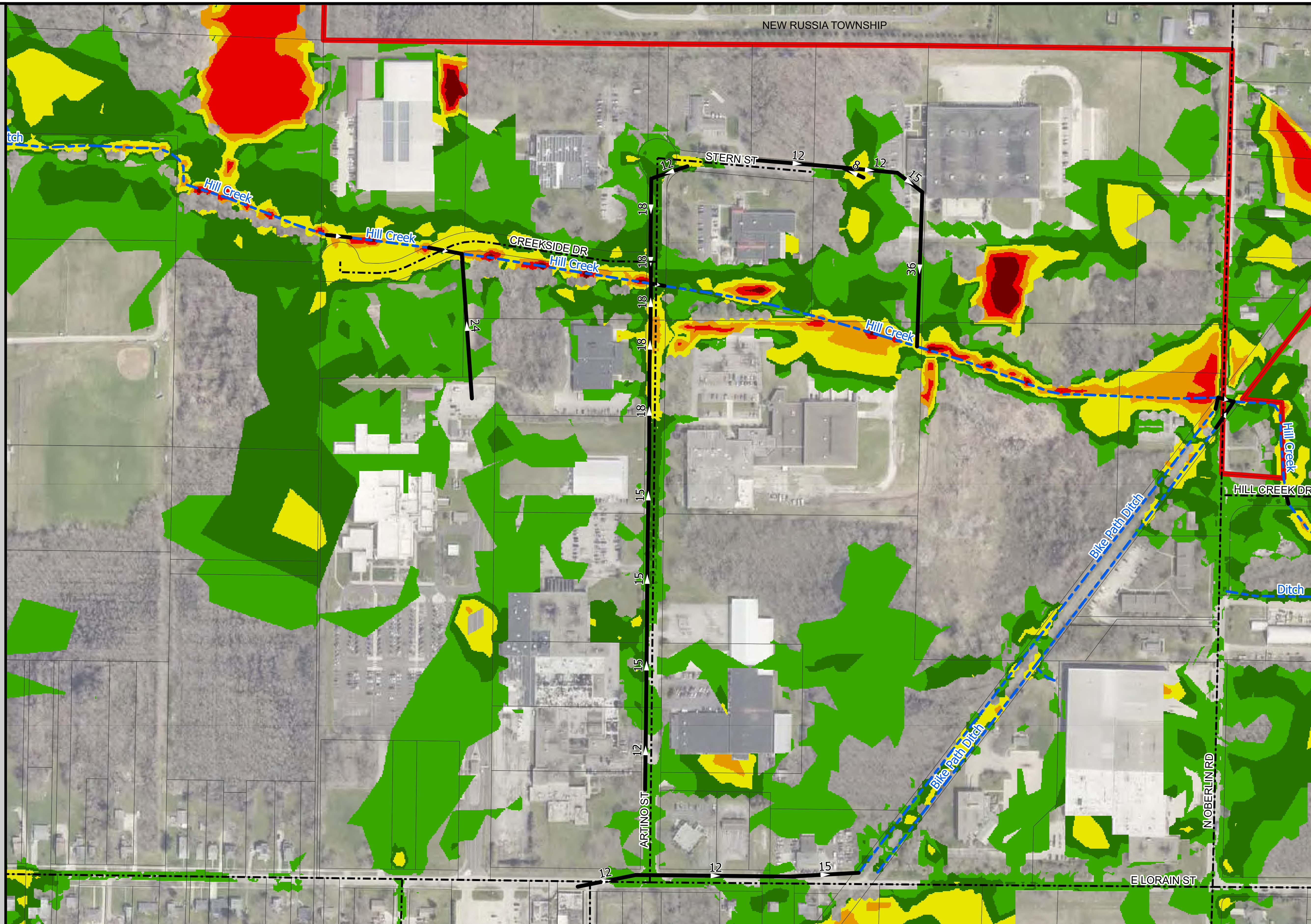
0 55 110 220 330 Feet

**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

100-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

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KEM K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS

CITY OF OBERLIN

STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
ARTINO

DESIGN STORM

100-YEAR

0 55 110 220 330 Feet

**LEGEND**

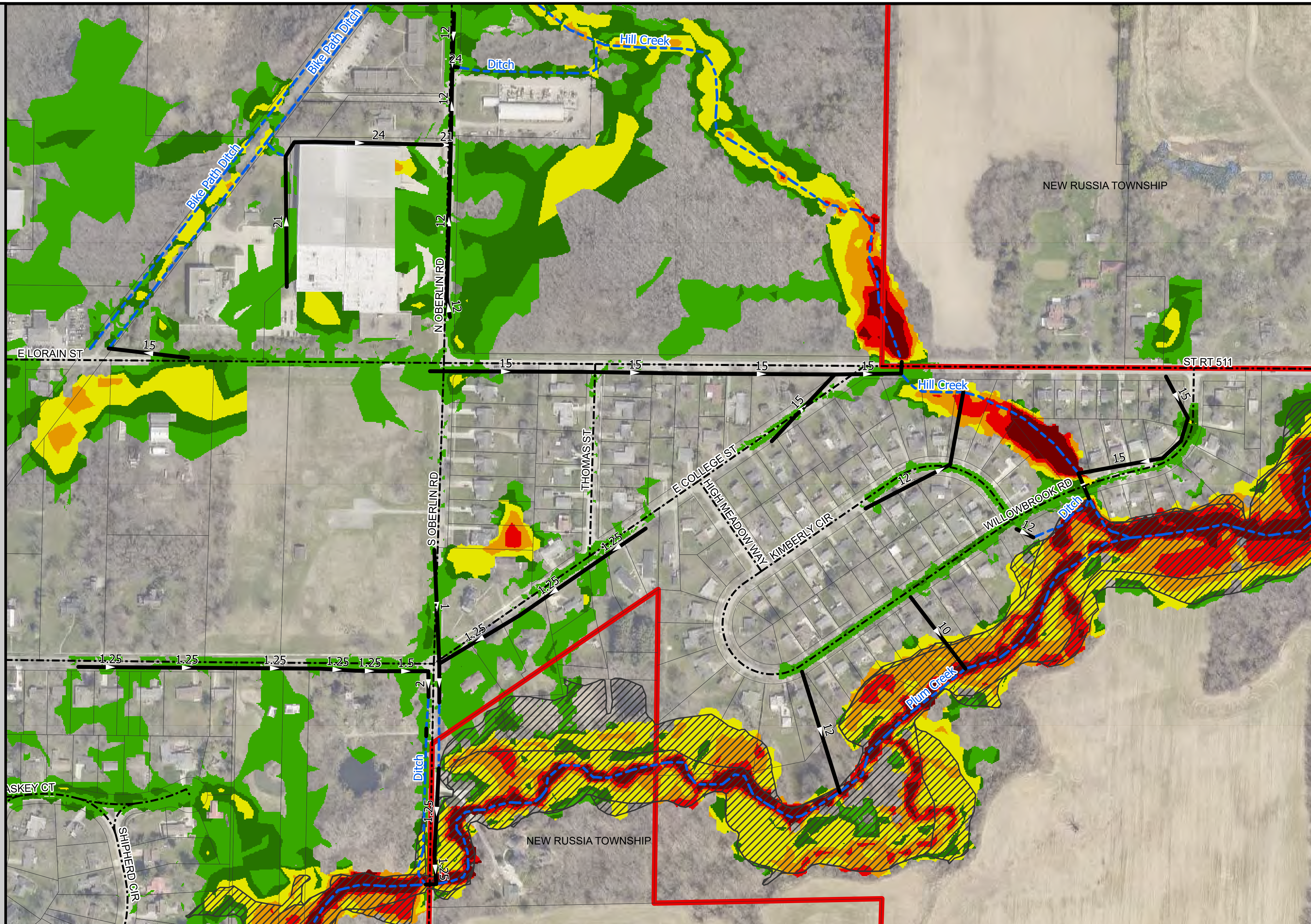
- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

100-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00

Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.




KEM
K.E. McCARTNEY & ASSOCIATES
ENGINEERS • PLANNERS • SURVEYORS

CITY OF OBERLIN

STORMWATER STRATEGIC PLAN

03/12/2026

FLOOD RASTER MAP
NORTH OBERLIN - EAST LORAIN

DESIGN STORM

100-YEAR

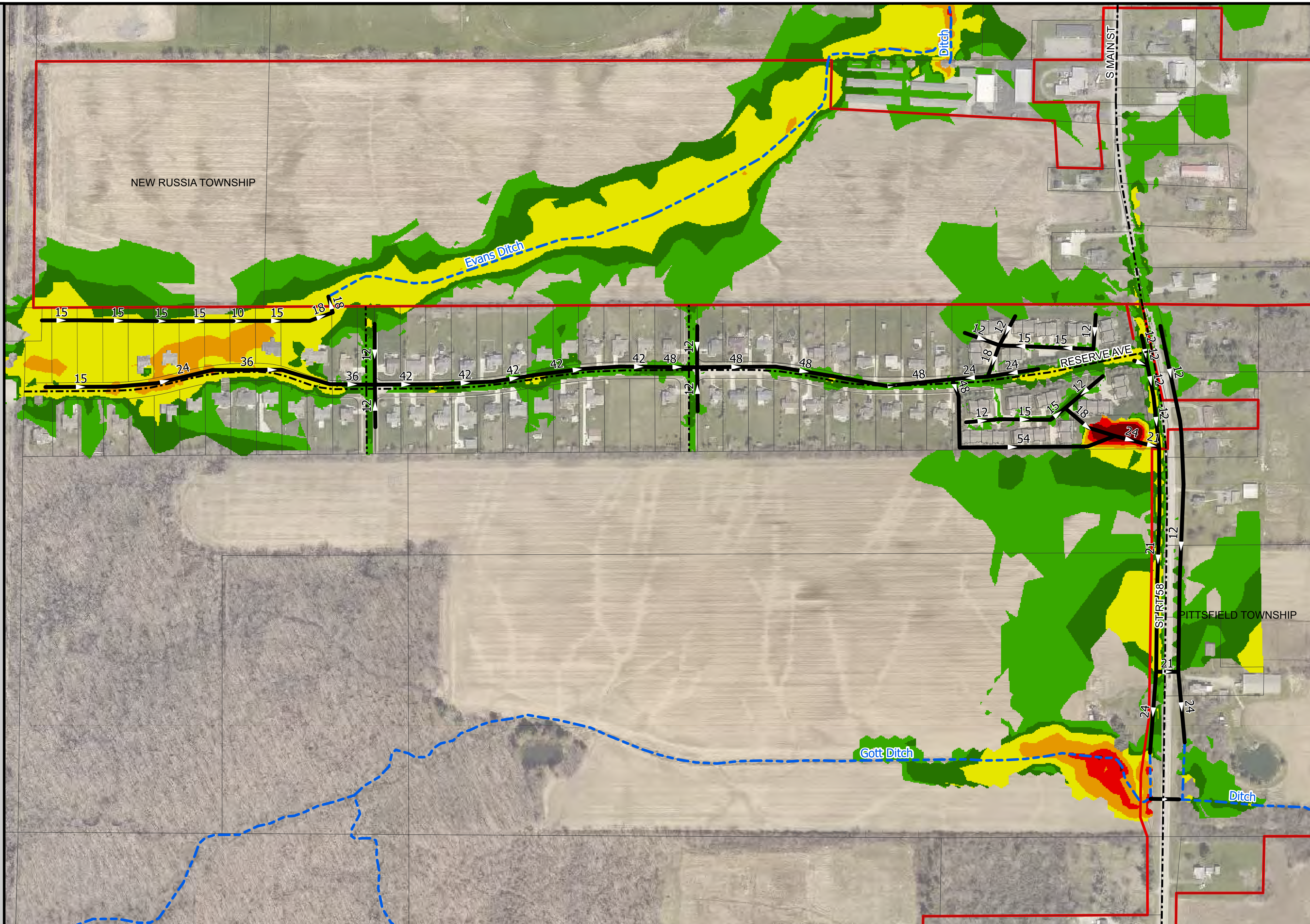
0 55 110 220 330
Feet

## LEGEND

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

100-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

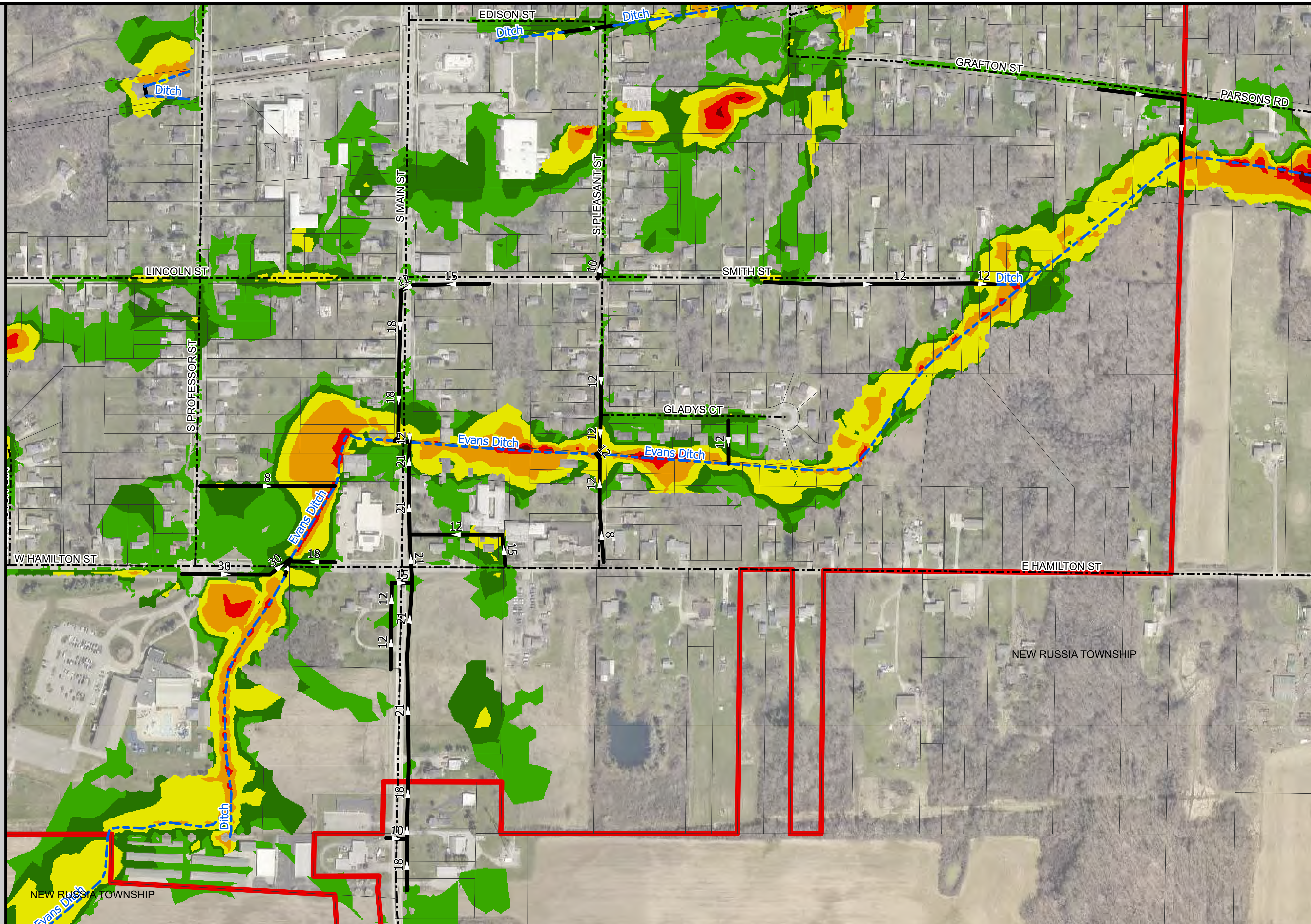
| | | | | | | |
|---|---|---|---|---|---|---|
| KEM K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS | CITY OF OBERLIN | STORMWATER STRATEGIC PLAN<br>03/12/2026 | FLOOD RASTER MAP<br>RESERVE | DESIGN STORM<br>100-YEAR | 0 65 130 260 390 Feet | 13 / 14 |

**LEGEND**

- ## Pipe Size (in)
- Storm Sewer
- Stream/Channel
- Road Centerline
- Tax Parcel
- Corporation Limits
- FEMA Flood Hazard

100-Yr Max Flood Depth (ft)

- 0.08 - 0.49
- 0.50 - 0.99
- 1.00 - 1.99
- 2.00 - 2.99
- 3.00 - 3.99
- ≥ 4.00
- Culvert




Notes:

Max flood depths were calculated using 2D Stormwater Management Modeling (SWMM) software.

| | | | | | |
|---|---|---|---|---|---|
| KEM K.E. McCARTNEY & ASSOCIATES ENGINEERS • PLANNERS • SURVEYORS | CITY OF OBERLIN | STORMWATER STRATEGIC PLAN<br>03/12/2026 | FLOOD RASTER MAP<br>SOUTH MAIN | DESIGN STORM<br>100-YEAR | 0 65 130 260 390 Feet |

# Sewer CCTV Inspection Report (Standardized Form)

## 1. General Information

- **Utility / Owner:** ______________________________
- **Project Name / ID:** ___________________________
- **Inspection Contractor:** _______________________
- **Inspector Name(s):** ___________________________
- **Date of Inspection:** ____ / ____ / ______
- **Start Time:** ________ **End Time:** ________
- **Weather Conditions (last 72 hrs):** ______________

## 2. Pipe Identification

- **Street / Location:** ___________________________
- **Upstream MH ID:** ___________ **Downstream MH ID:** ___________
- **Pipe Segment ID:** _____________________________
- **Asset ID (GIS/CMMS):** _________________________

## 3. Pipe Characteristics

- **Pipe Use:** ☐ Sanitary ☐ Storm ☐ Combined ☐ Other: __________
- **Material:** ☐ VCP ☐ PVC ☐ DIP ☐ CMP ☐ RCP ☐ Brick ☐ Other: ______
- **Diameter (in):** ________
- **Shape:** ☐ Circular ☐ Egg ☐ Box ☐ Other: __________
- **Length (ft):** ________
- **Lining Present:** ☐ No ☐ Yes (Type: __________ Year: ______)

## 4. Inspection Method

- **Inspection Type:** ☐ Routine ☐ Post-Cleaning ☐ Pre-Rehab ☐ Post-Rehab ☐ Complaint
- **Flow Control:** ☐ None ☐ Plugged ☐ Bypassed ☐ Reduced
- **Cleaning Performed Prior:** ☐ No ☐ Yes (Method: __________)
- **Camera System:** ________________________________
- **Camera ID:** __________ **Truck / Unit #:** __________

## 5. Observations Summary (Check all that apply)

### Structural

- ☐ Cracks (☐ Circumferential ☐ Longitudinal ☐ Multiple)
- ☐ Fracture / Broken Pipe
- ☐ Deformation / Ovality
- ☐ Joint Offset / Separation
- ☐ Collapsed / Partially Collapsed
- ☐ Corrosion / Deterioration

### Operation & Maintenance (O&M)

- ☐ Roots (☐ Fine ☐ Moderate ☐ Heavy)
- ☐ Grease
- ☐ Debris / Silt / Sand
- ☐ Standing Water
- ☐ Infiltration / Inflow

### Construction / Other

- ☐ Service Laterals (Count: ______)
- ☐ Protruding Tap
- ☐ Abandoned Service
- ☐ Cross Bore / Obstruction
- ☐ Other: ____________________________________________

## 6. Defect Log (Repeat as needed)

| Distance (ft) | Clock Position | Defect Description | Severity (1–5) | Photo / Video Ref |
|---|---|---|---|---|
| | | | | |

## 7. Condition Rating (Optional)

- **Structural Condition Grade (1–5):** ________
- **O&M Condition Grade (1–5):** ________
- **Overall Condition:** ☐ Good ☐ Fair ☐ Poor ☐ Critical

## 8. Recommendations

- ☐ No Action Required
- ☐ Routine Cleaning
- ☐ Root Control
- ☐ Spot Repair
- ☐ Lining / Rehabilitation
- ☐ Replacement
- **Comments:**_______________________________________________________________
  _______________________________________________________________________

## 9. Access Structure Condition (if observed)

- **Upstream MH Condition:** ☐ Good ☐ Fair ☐ Poor
- **Downstream MH Condition:** ☐ Good ☐ Fair ☐ Poor
- **Notes:** ________________________________________

## 10. Attachments

☐ Video File
☐ Photos
☐ Sketch / Map
☐ PACP-Compatible Export (if applicable)

## 11. Certification

I certify that this inspection was performed in accordance with standard CCTV inspection practices.

- **Inspector Signature:** ___________________________ **Date:** ____________

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*Note: This form is designed to align with common industry practices and can be adapted to NASSCO PACP/MACP/LACP requirements if formal coding is required.*

**General Ditch Restoration Specifications**

1. **Clearing and Grubbing:**
   This work includes clearing, grubbing, scalping, and removing trees, stumps, brush, vegetation, log jams, and miscellaneous obstructions necessary to complete the project. Remove all debris within the work limits to allow future mowing and maintenance. All clearing within easements and access paths shall follow the plans unless otherwise directed by the Engineer.

   Trees slated for removal must be field-verified with the Engineer and City, including trees within 5 feet of the easement line to determine whether alternate access routes are required. Trees to remain shall be protected; any damage or removal of protected trees will require compensation to the property owner based on the current Ohio Timber Price Report. Pruning and wound dressing shall follow ODOT Item 666.

   To protect federally endangered bat species, tree cutting restrictions apply:

   - Indiana bat: no cutting of woody stems >5 in. DBH from April 1–September 30.
   - Northern long-eared bat: no cutting of woody stems >3 in. DBH from April 1–September 30.

   If cutting within this window is unavoidable, the contractor must coordinate all required surveys, assessments, and compliance measures.

   Within non-excavated ditch banks, cut and grind stumps to grade without removing roots. Do not remove subsurface vegetation. Trim overhanging roots and branches neatly and seal with grafting wax. All damage shall be repaired at the contractor's expense.

   The contractor is responsible for identifying and removing all fallen trees, logs, and log jams within the easement, including those not specifically marked on the plans.

2. **Excavation and Spoil Management:**
   Perform all ditch excavation from the top of bank or side slopes; no equipment or vehicles may operate in the ditch bottom. Do not place fill in the ditch or within any floodplain. All excavated material shall be hauled off-site to an approved upland disposal location unless otherwise noted in the plans.

   Excavated material shall not be stockpiled in the stream channel, on stream banks, in adjacent wetlands, or within the floodplain. All spoils must be loaded directly into enclosed truck beds and transported to an approved upland disposal site, and no material may be discharged back into jurisdictional waters. All work shall be performed from above the top of bank and outside the flowing portion of the ditch.

3. **Wetland Protection Requirements**
   All work in wetlands shall occur on timber mats and only when the ground is frozen or sufficiently dry to prevent rutting or disturbance. Timber mats shown on the plans are diagrammatic; remove mats promptly after use.

   Tree removal in wetlands shall be kept to a minimum. Any trees that must be removed shall be cut at or above ground level without disturbing the stumps or roots. All woody debris shall be removed from wetlands without the use of heavy equipment. Bulldozing and placement of any fill material, including gravel, are not permitted.

4. **In-Stream Work Restrictions**
   All in-stream work shall be performed from above the bank and outside the flowing section of the ditch. Work must occur during low-flow or no-flow conditions.

   No work within the water is allowed in perennial streams from March 15 through June 30 to protect aquatic species and their habitats. Petroleum products such as oils, greases, and hydraulic fluids must be kept out of surface waters at all times.

5. **Seeding, Mulching, and Site Restoration**
   Stabilize all areas where material has been removed from the channel using seed and mulch. Restore all disturbed areas outside the channel to original conditions and reseed or replant with native riparian species to prevent erosion and sedimentation.

   ODOT Class 5B seeding and mulching shall be used within the easement limits. This item includes all repair seeding, inter-seeding, mulching, lime, fertilizer, and water required per ODOT 659 to correct erosion or damage prior to project completion.

6. **Erosion and Sediment Control Measures**
   Install erosion control blankets on all seeded ditch banks and slopes. Provide temporary sediment and erosion control measures, such as silt fence, compost filter socks, and construction entrances, as needed to prevent dredged material or return water from entering the stream or leaving the construction limits.

**EASEMENT**

This agreement ("Agreement") is made this _______ day of __________________**, 20**_______, by and between:

- **Grantor**: _____________________________________, the owner(s) of the property described herein ("Grantor"), and
- **Grantee**: City of Oberlin, a municipality organized under the laws of the State of Ohio, its successors and assigns ("Grantee").

**1. Grant of Easement**

Grantor hereby grants and conveys to Grantee, its successors and assigns, a perpetual, non-exclusive easement ("Easement") over, under, upon, and across the land described in *Exhibit A* attached hereto ("Easement Area"), for the purpose of constructing, installing, operating, inspecting, repairing, replacing, and upgrading stormwater facilities, including but not limited to storm sewers, culverts, manholes, ditches, swales, detention/retention basins, outfalls, and all related appurtenances ("Facilities").

**2. Access Rights**

Grantee shall have the right of reasonable ingress and egress across the Easement Area, and adjoining lands of Grantor if necessary, for personnel, vehicles, and equipment, to exercise the rights granted herein.

**3. Restrictions on Use**

(a) Grantor shall not construct, install, or permit any building, structure, fence, wall, pavement, utility line, or other obstruction within the Easement Area without the prior written consent of Grantee.
(b) Grantor shall not plant trees or woody vegetation within the Easement Area.
(c) Grantor may use the Easement Area for lawns, gardens, or other surface uses that do not interfere with the Facilities or Grantee's access.

**4. Maintenance**

(a) Grantee shall be responsible for the operation, maintenance, repair, and replacement of publicly owned Facilities within the Easement Area.
(b) Grantor shall be responsible for maintaining the surface of the Easement Area, including mowing and routine care, and for maintaining any privately owned stormwater facilities therein.

**5. Restoration**

Upon completion of any work within the Easement Area, Grantee shall restore the Easement Area to as near its original condition as is reasonably practicable, excluding replacement of prohibited improvements.

**6. Emergency Access**

In the event of an emergency affecting the Facilities or stormwater conveyance, Grantee may enter the Easement Area at any time without prior notice to Grantor.

**7. Binding Effect**

This Easement shall run with the land and be binding upon Grantor and Grantor's heirs, successors, and assigns, and shall inure to the benefit of Grantee, its successors and assigns.

**8. Miscellaneous**

- Governing Law: This Agreement shall be governed by the laws of the State of Ohio.
- Entire Agreement: This Agreement constitutes the entire understanding of the parties regarding the Easement.
- Recording: This Agreement shall be recorded in the [County] Recorder's Office at Grantee's expense.

**IN WITNESS WHEREOF**, the parties have executed this Agreement as of the date first written above.

**GRANTOR:**

Signature: ______________________________

Name: ______________________________

**GRANTEE:**

Signature: ______________________________

Name: ______________________________

Title: ______________________________

**STATE OF OHIO**
COUNTY OF ____________________ : ss.

On this ______ day of _________________**, 20**,______ before me, a Notary Public, personally appeared ______________________________, known to me to be the person(s) who executed the foregoing instrument and acknowledged it to be their free act and deed.

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Notary Public

Approved as to Form:____________________________________

**Exhibit A** – Legal Description Easement Area