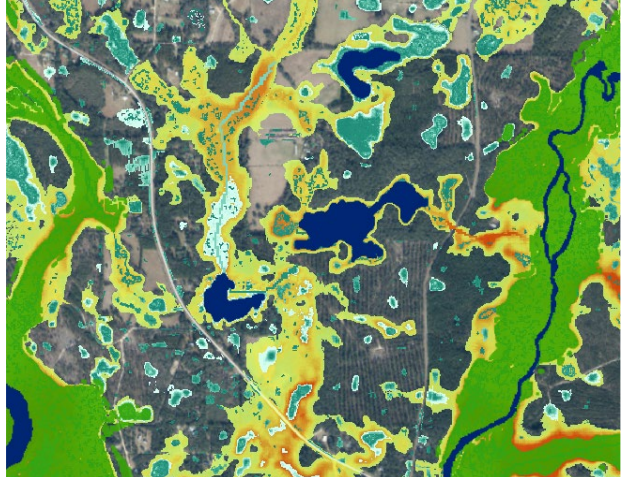


# CITY OF VERNON

## VULNERABILITY ASSESSMENT



**AUGUST 2024**

**DEP AGREEMENT NO. 24RRE03**

Emerald Coast Regional Council Resilience Project

## **CITY OF VERNON VULNERABILITY ASSESSMENT**



**8/30/2024**

This work was funded in part through a grant agreement from the Florida Department of Environmental Protection's Office of Resilience and Coastal Protection Resilient Florida Program. The views, statements, findings, conclusions, and recommendations expressed herein are those of the author(s) and do not necessarily reflect the views of the State of Florida or any of its subagencies.

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## Acronyms

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<b>BMAP</b>	Basin Management Action Plan
<b>CORDEX</b>	Coordinated Regional Climate Downscaling Experiment
<b>CR</b>	County Road
<b>BMAP</b>	Basin Management Action Plan
<b>DEM</b>	Digital Elevation Model
<b>ECRC</b>	Emerald Coast Regional Council
<b>FDEM</b>	Florida Division of Emergency Management
<b>FDEP</b>	Florida Department of Environmental Protection
<b>FEMA</b>	Federal Emergency Management Agency
<b>FFE</b>	Finished Floor Elevation
<b>GIS</b>	Geographic Information Systems
<b>LiDAR</b>	Light Detection and Ranging
<b>LULC</b>	Land Use Land Cover
<b>NAVD88</b>	North American Vertical Datum of 1988
<b>NHD</b>	National Hydrography Dataset
<b>NOAA</b>	National Oceanic and Atmospheric Administration
<b>NWS</b>	National Weather Service
<b>SLR</b>	Sea Level Rise
<b>SSURGO</b>	Soil Survey Geographic Database
<b>USGS</b>	U.S. Geological Survey
<b>VA</b>	Vulnerability Assessment

## Executive Summary

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The City of Vernon is proactively addressing the challenges posed by extreme weather events, specifically focusing on the increased risk of flooding due to extreme rainfall events. Vernon and the Emerald Coast Regional Council (ECRC) have obtained a grant from the Florida Department of Environmental Protection (FDEP) for a comprehensive vulnerability assessment. This report summarizes the data, methodology, and analyses conducted by Vernon and the Project Team.

Resilient Florida was established as part of a statewide initiative to enhance Florida's resilience against the impacts of sea level rise, intensified storms, and flooding. A key aspect of the Resilient Florida Program is the creation of Vulnerability Assessments. These assessments are critical for communities seeking access to state resilience funding. They provide a detailed analysis of a community's specific vulnerabilities to climate-related hazards including flooding, sea level rise, and extreme weather events. They are essential for identifying high-risk areas, assessing the potential impacts on infrastructure, and determining the most effective strategies for mitigation and adaptation.

By conducting Vulnerability Assessments, communities not only gain a deeper understanding of their unique risks, but also align with the state's requirements for accessing resilience funding. This funding is instrumental in supporting local governments to plan, prepare, and implement resilience projects. It ensures that communities are better equipped to protect their infrastructure from adverse weather events.

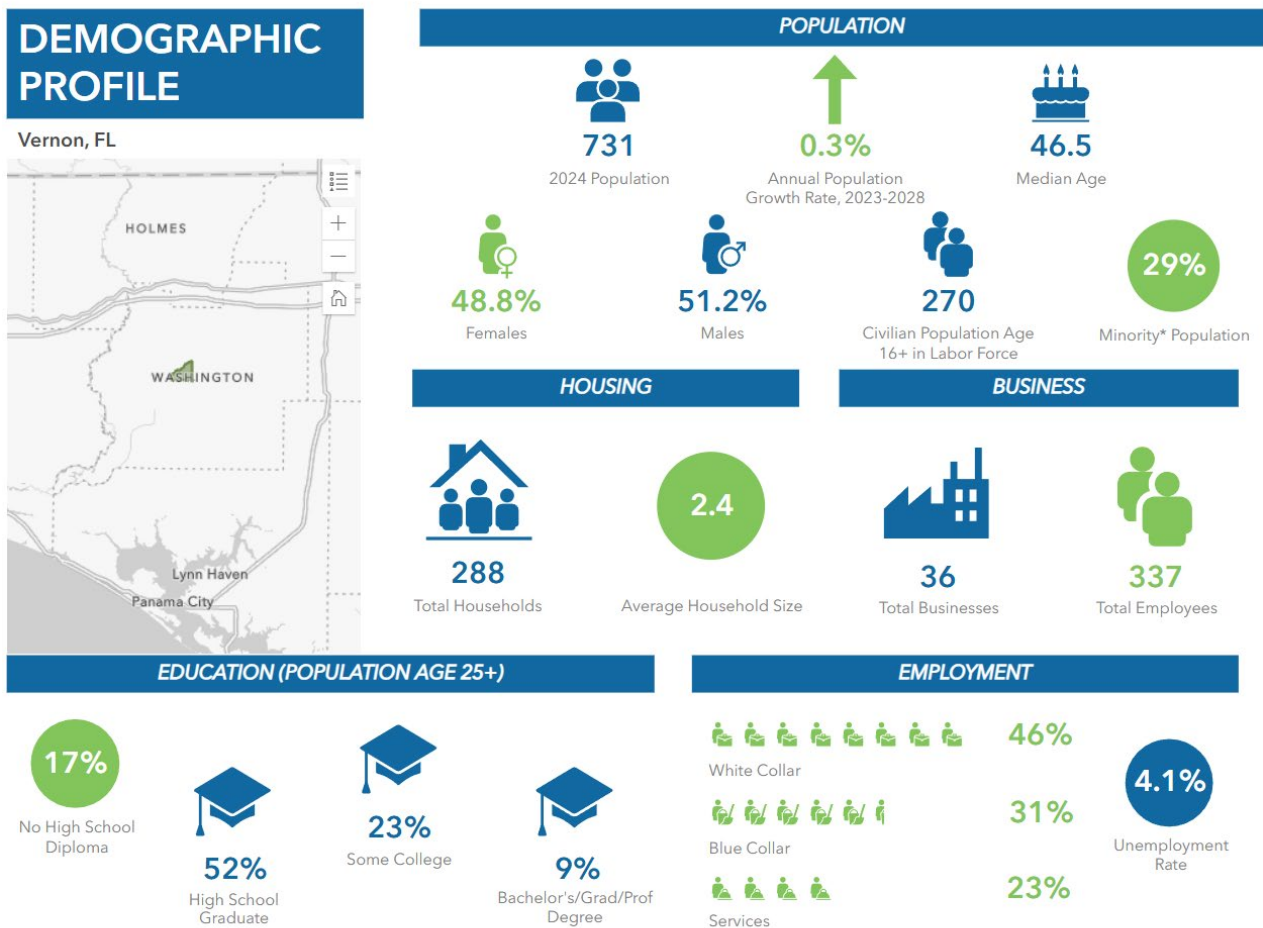
For the purposes of this assessment, the Project Team used the Inundate! GIS modeling tool to analyze potential flooding under the state's required future precipitation scenarios. The methodology adopted allows for a detailed understanding of how changes in rainfall patterns can affect public facilities and critical infrastructure in Vernon and identifies target areas prone to flooding. Throughout the process, the Project Team coordinated with Michael Baker International, as they were working on Washington County's Vulnerability Assessments concurrently. Data was shared in cases of municipal assets located outside of city limits.

For the most part, Critical Assets in the City of Vernon are already located in good locations to avoid any projected future flood events. Potentially affected assets include the City of Vernon Wastewater Treatment Facility, Vernon Middle School, Vernon High School, Vernon City Hall, the Vernon Cemetery and portions of Moss Hill Road and Pioneer Road. It would be advisable for the City of Vernon or Washington County to conduct a detailed assessment to understand the specific vulnerabilities of these assets and to develop plans to minimize any potential impacts on the community.

## I. Overview

### Background

The City of Vernon is located in Washinton County, in the Florida Panhandle. Officially incorporated in 1926, Vernon held the county seat until 1927, when the seat was moved to Chipley. Vernon's population peaked in the 1980s at 885 individuals, and growth has remained fairly steady with a current estimated population of 731 (Esri).



This infographic contains data provided by Esri and Infogroup. The vintage of the data is 2024, 2029 (Esri estimates and projections). \*Minority population = Total Population - White, Non-Hispanic Population

## Resilient Florida Program

This Vulnerability Assessment was funded in part through a grant agreement from the Florida Department of Environmental Protection's Office of Resilience and Coastal Protection Resilient Florida Program. The Resilient Florida Program was created as a result of Senate Bill 1954 and House Bill 7019, passed in 2021. This legislation, codified as Florida Statute 380.093, directs all municipalities and counties to create assessments to inform state and local planning, ensuring that adaptation and mitigation strategies are grounded in current and projected risks.

The Emerald Coast Regional Council developed this assessment concurrent with Vulnerability Assessments for the Town of Century in Escambia County and the municipalities of Caryville, Chipley, Wausau, and Ebro in Washington County.

## Goals and Objectives

The purpose of this report is threefold:

**To Identify and Analyze Risks:** The Emerald Coast region, like many others, is increasingly susceptible to a range of natural hazards. In this assessment, the potential impact of future extreme rainfall events is modeled. This allows the community and project team to identify critical assets that may be vulnerable to inundation in the future.

**To Inform and Guide Resilience Planning:** The information gathered in this report is vital for developing effective strategies to enhance community resilience. It can serve as a foundational document to guide policymakers, planners, and stakeholders in making informed decisions. The information in this report should be applied when constructing or upgrading infrastructure, revising development ordinances, or enhancing emergency response plans.

**To Engage and Educate the Community:** Awareness and understanding are key components in building a resilient community. This Vulnerability Assessment is not only a technical document, but also a tool that can be used to engage the community. By specifically identifying critical assets at risk and target areas, the assessment can be used to help determine future priorities.

## Kickoff Meeting & Outreach

After initial outreach to all the municipalities in Washington County, a single kickoff meeting was held in Chipley on Tuesday, May 7th, 2024. All communities participating in the Vulnerability Assessment process were provided with draft materials and invited to attend. Washington County staff also attended to share insights from their ongoing Vulnerability Assessment and to facilitate coordination concerning county assets within municipal boundaries. The primary goal of this meeting was to introduce the project, outline its objectives, and set the stage for a comprehensive approach to assessing and addressing regional vulnerabilities to flooding from extreme rain events.

During the meeting, Emerald Coast Regional Council (ECRC) staff presented an overview of the project, detailing the scope, expected outcomes, and the critical role of the Vulnerability Assessment in guiding resilience planning. Attendees were provided with draft asset lists and maps, and critical assets as defined by Florida Statutes were discussed. Stakeholders were encouraged to share their knowledge and experiences, contributing valuable data on local environmental conditions, infrastructure vulnerabilities, and community needs. Representatives from Michael Baker International, who were working on the Vulnerability Assessment for unincorporated Washington County, attended virtually and shared insights from their ongoing project.

During and after the meeting, ECRC staff consulted with the communities regarding details of their asset lists and gathered feedback on the draft inundation model results.

## Work Plan

The agreement with the Florida Department of Environmental Protection to perform the Vulnerability Assessments contained the following tasks:

### **Task 1: Kickoff Meeting**

Develop an overall project management plan and address initial actions. Conduct a kickoff meeting to discuss the project scope, goals, schedule, key milestones, and deliverables. Prepare meeting materials, including the sign-in sheet and project schedule.

### **Task 2: Acquire Background Data**

Research and compile data necessary for the Vulnerability Assessment (VA), including critical and regionally significant asset inventory, topographic data, and flood scenario-related data. Identify and rectify any data gaps to ensure comprehensive data coverage.

### **Task 3: Exposure Analysis**

Perform an exposure analysis to determine the depth of water caused by various flood scenarios, including tidal flooding, storm surge flooding, and rainfall-induced flooding. Detail the modeling processes and provide results through tables and maps.

**Task 4: Sensitivity Analysis**

Measure the impact of flooding on assets using data from the exposure analysis. Evaluate the impact of flood severity on each asset class and assign a risk level. Provide detailed findings and an initial list of impacted critical and regionally significant assets.

**Task 5: Identify Focus Areas**

Identify focus areas based on the exposure and sensitivity analyses. Assign focus areas to locations or assets that are particularly vulnerable and require adaptation strategies. Provide justification, tables, maps, and GIS files for the identified focus areas.

**Task 6: Final Vulnerability Assessment Report, Maps, and Tables**

Finalize the VA report, incorporating results from the exposure and sensitivity analyses, identified risks, and focus areas. Compile a list of critical and regionally significant assets impacted by flooding and specify the flood scenarios affecting each asset. Include GIS files and metadata in the final report.

**Task 7: Public Presentation**

Present the final VA results to local governing boards, technical committees, and other stakeholders. Share findings, provide recommendations for adaptation strategies, and inform the public about future risks. Prepare and distribute meeting materials and summarize meeting outcomes.

## II. Data Collection

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### Critical/Regionally Significant Asset Data

The data collection process began with identifying and obtaining GIS datasets for critical and regionally significant assets. The Florida Statewide Resilience Dataset from FDEP was used as a starting point. It was compiled in 2023 and includes critical assets sourced from state, federal, and regional datasets, as well as locally provided asset data where available. Local government staff were consulted to identify the critical assets within this dataset that are owned and/or managed by the municipality, as well as any critical assets missing from the dataset. ECRC staff also utilized the Washington County Property Appraiser's record search to identify ownership of potential critical assets.

Critical Assets were identified by the four categories defined by 380.093(2)(a), Florida Statutes:

1. **Transportation assets and evacuation routes**, including airports, bridges, bus terminals, ports, major roadways, marinas, rail facilities, and railroad bridges.
2. **Critical infrastructure**, including wastewater treatment facilities and lift stations, stormwater treatment facilities and pump stations, drinking water facilities, water utility conveyance systems, electric production and supply facilities, solid and hazardous waste facilities, military installations, communications facilities, and disaster debris management sites.
3. **Critical community and emergency facilities**, including schools, colleges, universities, community centers, correctional facilities, disaster recovery centers, emergency medical service facilities, emergency operation centers, fire stations, health care facilities, hospitals, law enforcement facilities, local government facilities, logistical staging areas, affordable public housing, risk shelter inventory, and state government facilities.
4. **Natural, cultural, and historical resources**, including conservation lands, parks, shorelines, surface waters, wetlands, and historical and cultural assets.

Table 1 provides a summary of critical assets identified for the City of Vernon.

**Table 1. Critical Assets Inventory**

Transportation Assets and Evacuation Routes			
Name	Type	Owner/Operator	Elevation*
CHURCH ST	Major Roadways	City of Vernon	45.25'
COURT AVE	Major Roadways	City of Vernon	41.64'
MCFATTER AVE	Major Roadways	City of Vernon	45.03'
RUBYS RD	Major Roadways	City of Vernon	43.68'
YELLOW JACKET DR	Major Roadways	City of Vernon	43.27'
Critical Infrastructure			
Name	Type	Owner/Operator	Elevation
CITY OF VERNON WWTF	Wastewater Treatment Facilities & Lift Stations	City of Vernon	41.77'
CITY OF VERNON PLANT #1	Drinking Water Facilities	City of Vernon	45.13'
CITY OF VERNON PLANT FOR WELL 3	Drinking Water Facilities	City of Vernon	56.88'
CITY OF VERNON STORAGE TANK #1	Water Utility Conveyance Systems	City of Vernon	44.81'
VERNON VOLUNTEER FIRE DEPT	Hazardous Waste Facilities	City of Vernon	45.23'
Critical Community and Emergency Facilities			
Name	Type	Owner/Operator	Elevation
VERNON MIDDLE SCHOOL	Schools	Washington County School District	68.25'
VERNON HIGH SCHOOL	Schools	Washington County School District	89.31'
VERNON VFD	Fire Stations	City of Vernon	48.82'
VERNON CITY HALL	Local Government Facilities	City of Vernon	44.85'
VERNON HIGH SCHOOL	Risk Shelters	Washington County School District	89.01'
VERNON MIDDLE SCHOOL	Risk Shelters	Washington County School District	67.16'

## City of Vernon Vulnerability Assessment

Natural, Cultural, and Historical Resources			
Name	Type	Owner/Operator	Elevation*
HOLMES CREEK BRIDGE	Historical and Cultural Assets	City of Vernon	48.3'
VERNON CEMETERY	Historical and Cultural Assets	City of Vernon	43.05'
VERNON HIGH SCHOOL (OLD)	Historical and Cultural Assets	City of Vernon	44.96'

*\*Elevations for linear (roadway) and polygon (cemetery) features are averages across the length or area within the city limits.*

Local government staff also identified Regionally Significant Assets, as defined by 380.093(2)(d), Florida Statutes:

“Regionally significant assets” means critical assets that support the needs of communities spanning multiple geopolitical jurisdictions, including, but not limited to, water resource facilities, regional medical centers, emergency operations centers, regional utilities, major transportation hubs and corridors, airports, and seaports.

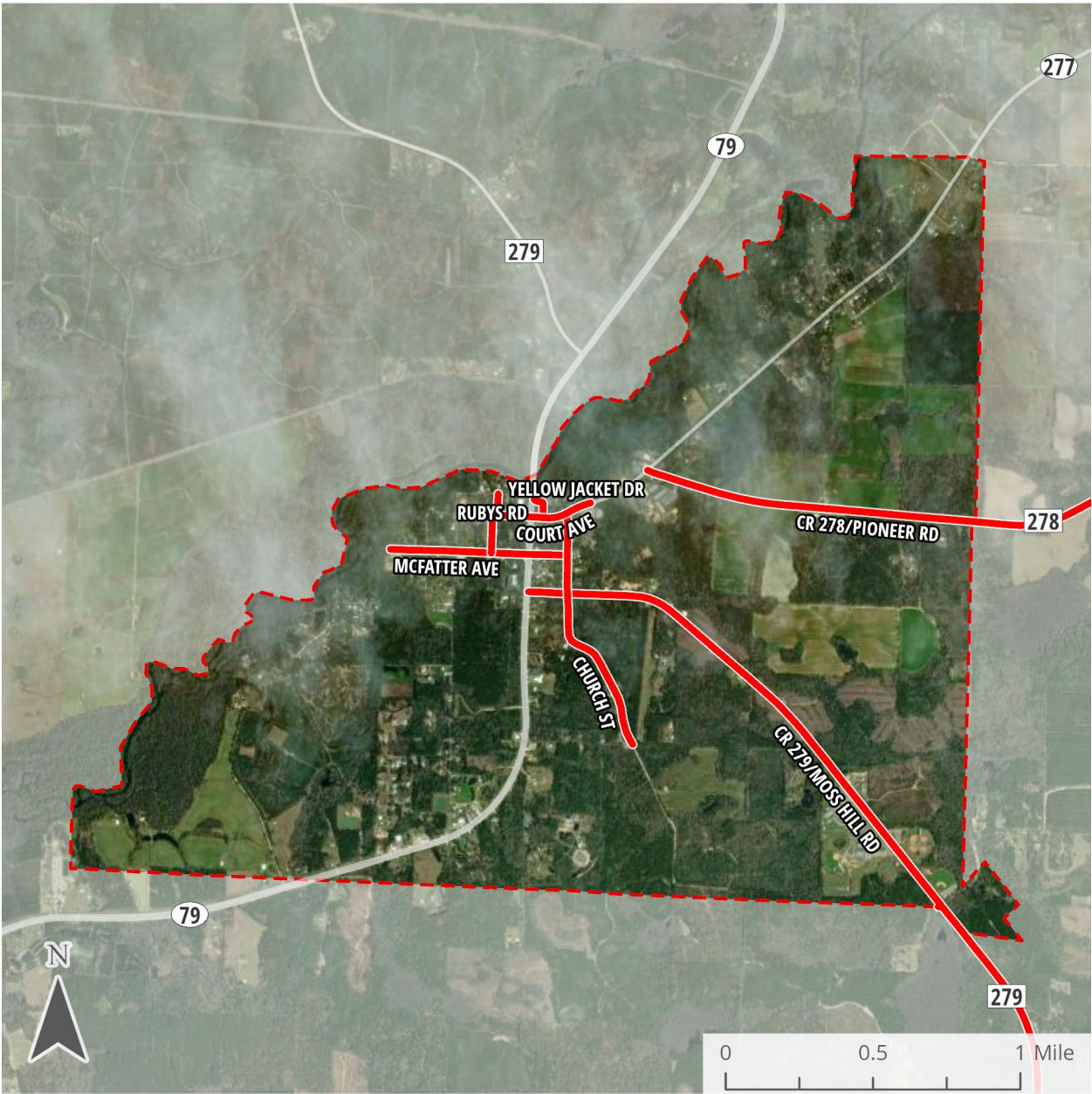
All identified Regionally Significant Assets in the City of Vernon are owned and operated by Washington County.

**Table 2. Regionally Significant Assets**

Regionally Significant Assets				
Name	Type	Class	Owner/Operator	Elevation*
CR 279/MOSS HILL RD	Major Roadways	Transportation Assets & Evacuation Routes	Washington County	57.96'
CR 278/PIONEER RD	Major Roadways	Transportation Assets & Evacuation Routes	Washington County	48.34'

*\*Elevations for linear (roadway) features are averages across the length or area within the city limits.*

Figure 1. Critical Assets - Transportation and Evacuation Routes



City of Vernon - Transportation and Evacuation Routes

— Major Roadways

Source: ECRC, FDEP, City of Vernon  
7/8/2024

Figure 2. Critical Assets - Critical Infrastructure

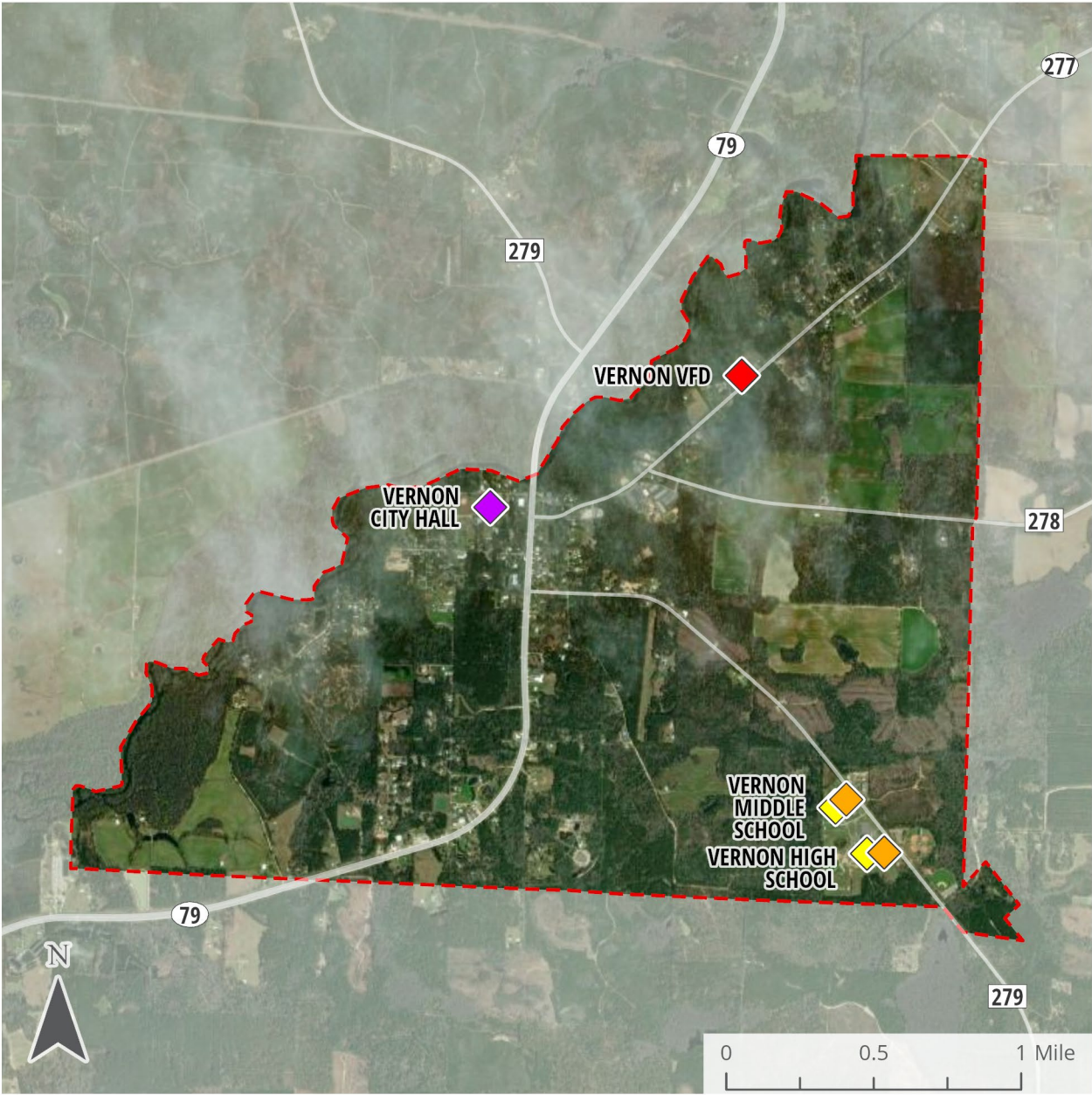


City of Vernon - Critical Infrastructure

- ▲ Wastewater Treatment Facilities & Lift Stations
- ▲ Drinking Water Facilities
- ▲ Water Utility Conveyance Systems
- ▲ Solid and Hazardous Waste Facilities

Source: ECRC, FDEP, City of Vernon  
7/8/2024

Figure 3. Critical Assets - Critical Community & Emergency Facilities



City of Vernon - Critical Community & Emergency Facilities

Source: ECRC, FDEP, City of Vernon  
7/8/2024




- Schools
- Fire Stations
- Local Government Facilities
- Risk Shelters

Figure 4. Critical Assets – Natural, Cultural, and Historical Resources



City of Vernon - Natural, Cultural, and Historical Resources

Source: ECRC, FDEP, City of Vernon  
7/8/2024

-  Historical and Cultural Assets
-  Historical and Cultural Assets
-  Historical and Cultural Assets

## Topographic Data

A digital elevation model (DEM) was obtained from USGS. The Florida Peninsular Hurricane Michael Supplemental DEM (2020) covers the majority of Washington County at a resolution of 2.5 feet. The DEM elevations are relative to the North American Vertical Datum of 1988 (NAVD88).

## Flood Scenario-Related Data

### Storm Surge

Storm surge data was sourced from both NOAA's National Storm Surge Risk Maps (v.3, 2022) and the Florida Statewide Regional Evacuation Study Program (a joint effort between FDEM and Florida's Regional Planning Councils, updated in 2020).

### Sea Level Rise

Sea Level Rise data was collected from NOAA's 2017 Intermediate-High SLR projections for 2040 and 2070.

### Precipitation

Precipitation data was sourced from NOAA Atlas 14. To derive future scenarios, CORDEX Near and Far 23<sup>rd</sup> percentile change factors were applied to the 24-hour, 100- and 500-year rain events from Atlas 14. This allowed for representation of extreme rain events under the 2040 and 2070 future time horizons.

## Data Gap Analysis

An accurate Vulnerability Analysis requires complete and current data to represent current and future conditions and allow communities to be better prepared for future inundation hazards. The purpose of the Data Gap Analysis is to 1) review data obtained and identify any critical missing data or low-quality information that may limit the Vulnerability Assessment's extent or reduce the accuracy of results, and 2) rectify any gaps in necessary data.

The tables below summarize the data included within the vulnerability assessments and indicate the availability of the data as follows:

- **Available** - Data Readily Available
- **Not Available** - Data Not Available
- **Partial** - Data Partially Obtained

**Table 3. Transportation Assets & Evacuation Routes**

Dataset	Availability	Source / Type	Comments
Airports	Available	FDEP Critical Assets Dataset with review and edits from local government staff	No additional assets were added based on local input. Private assets including rail facilities were removed.
Bridges	Partial		
Bus Terminals	Available		
Ports	Available		
Major Roadways	Available		Bridge elevation was not readily available, but was extracted from an unprocessed DEM.
Marinas	Available		
Rail Facilities	Available		
Railroad Bridges	Available		Not all asset types are applicable or present within Vernon.

**Table 4. Critical Infrastructure**

Dataset	Availability	Source / Type	Comments
Wastewater Treatment Facilities & Lift Stations	Available	FDEP Critical Assets Dataset (Geodatabase) with review and edits from local government staff	Many privately owned and controlled assets were included. These were removed after consultation with city staff.
Stormwater Treatment Facilities & Pump Stations	Available		
Drinking Water Facilities	Available		
Water Utility Conveyance Systems	Available		Additional water utility and stormwater facilities were added.
Electric Production & Supply Facilities	Available		
Solid & Hazardous Waste Facilities	Available		
Military Installations	Available		Not all infrastructure types are applicable or present within Vernon.
Communications Facilities	Available		
Disaster Debris Management Sites	Available		

**Table 5. Critical Community & Emergency Facilities**

Dataset	Availability	Source / Type	Comments
Schools	Available	FDEP Critical Assets Dataset (Geodatabase) with review and edits from local government staff	City staff did not identify any missing Critical Community and Emergency Facilities.  Not all facility types are applicable or present within Vernon.
Colleges & Universities	Available		
Community Centers	Available		
Correctional Facilities	Available		
Disaster Recovery Centers	Available		
Emergency Medical Service Facilities	Available		
Emergency Operations Centers	Available		
Fire Stations	Available		
Health Care Facilities	Available		
Hospitals	Available		
Law Enforcement Facilities	Available		
Local Government Facilities	Available		
Logistical Staging Areas	Available		
Affordable Public Housing	Available		
Risk Shelters	Available		
State Government Facilities	Available		

**Table 6. Natural, Cultural, & Historical Resources**

Dataset	Availability	Source / Type	Comments
Conservation Lands	Available	FDEP Critical Assets Dataset (Geodatabase) with review and edits from local government staff	Many private or state-owned and controlled assets included in the FDEP were removed from analysis. Not all resource types are applicable or present within Vernon.
Parks	Available		
Shorelines	Available		
Surface Waters	Available		
Wetlands	Available		
Historical & Cultural Assets	Available		

**Table 7. Topographic Data**

Dataset	Availability	Source	Type	Comments
LiDAR, DEM	Available	Florida Peninsular Hurricane Michael Supplemental (2020), 2.5ft resolution	Raster	Inundate! Model input
Finished Floor Elevation (FFE)	Not Available	-	-	Water higher than foundation slab height will be considered flooding

**Table 8. Flood Scenario Related Data**

<b>Dataset</b>	<b>Availability</b>	<b>Source</b>	<b>Type</b>	<b>Comments</b>
Precipitation	Available	NOAA Atlas 14	Raster	Inundate! Model input
Groundwater Level	Available	Inundate! Model	Raster	Available water storage is calculated within model
Sea Level Rise (SLR)	Available	NOAA Intermediate-High	Raster	Not applicable
Tidal Flooding	Available	NOAA	Raster	Not applicable
Storm Surge	Available	NOAA, FDEM	Raster, GIS Shapefile (polygon)	Not applicable
River Channel Cross-Sections	Available	Inundate! Model	GIS Shapefile (line)	Transects are created within model
Land Use	Available	USGS	Raster	Inundate! Model input
Evapotranspiration	Available	USGS	Raster	Not utilized in model
Soil Classification	Available	Soil Conservation Service (SSURGO)	Raster	Inundate! Model input
Lake Points	Available	USGS NHD	GIS Shapefile (point)	Inundate! Model input. Layer was edited to include missing lake points.
Change Factors	Available	CORDEX 24hr 100yr NEAR (2040) and FAR (2070) rasters	Raster	Inundate! Model input
Impervious Surfaces	Available	NOAA	Raster	Inundate! Model input
Building Footprints	Available	Microsoft	GIS Shapefile (polygon)	Inundate! Model input. Layer was edited to include missing footprints.
Burn Lines	Available	USGS NHD and user-defined (ECRC)	GIS Shapefile (line)	Inundate! Model input

## Data Gap Summary and Recommendations

The majority of data required for the vulnerability assessment was publicly available for download and use.

There were challenges obtaining Finished Floor Elevation (FFE) data for structures. Many municipalities could not provide the required documentation, often due to the limited availability of records or resource constraints. The cost to obtain accurate elevation data can be significant, and not all communities have the resources or systems to collect and maintain this information comprehensively.

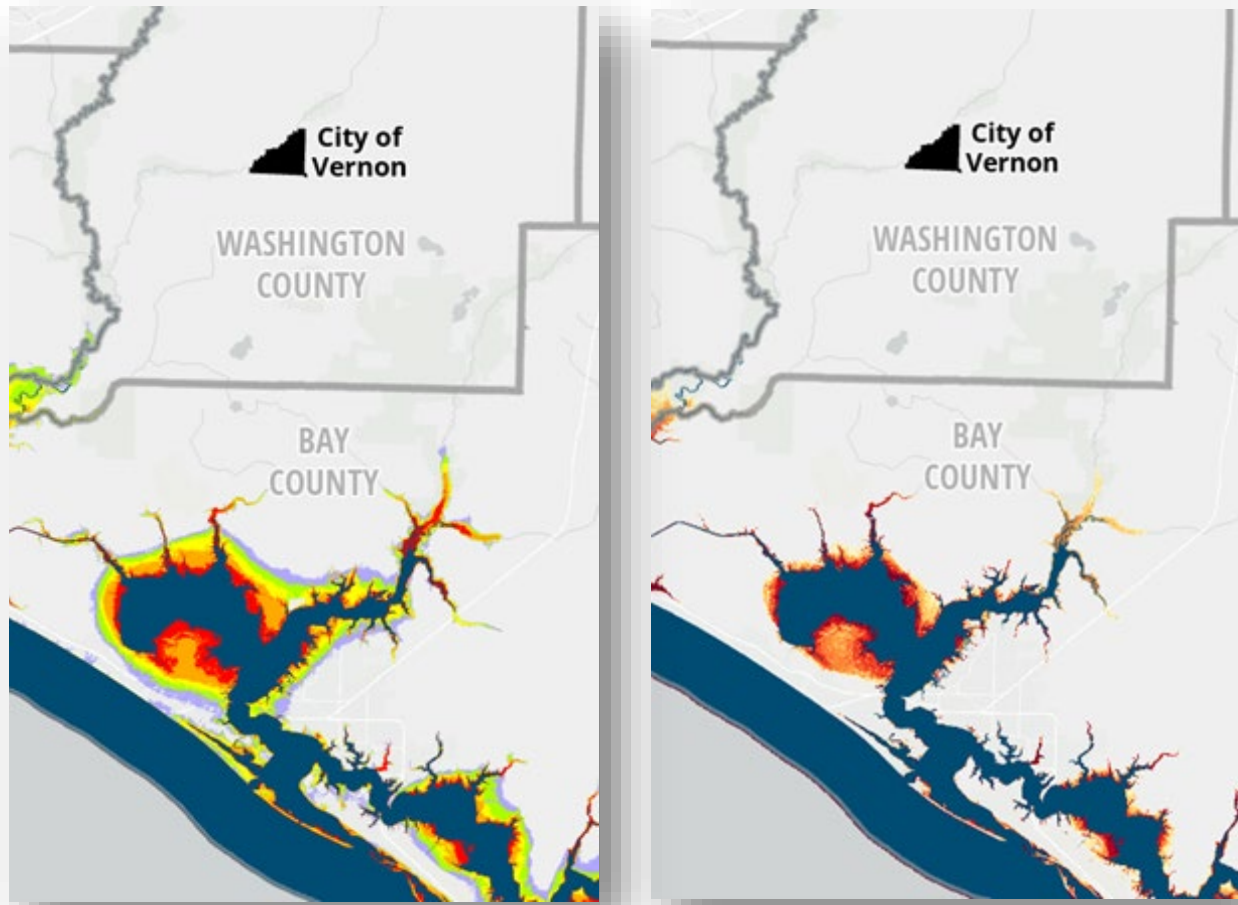
The absence of FFE data impacts the precision of the sensitivity analysis. This gap may lead to less accurate predictions regarding the vulnerability of certain assets. Fortunately, in most cases for Washington County municipalities, flooding around structures is minimal or is located on the parcel away from the structure itself.

To address this limitation, municipalities may consider grant opportunities or regional partnerships to ensure that FFE data is more readily available for future assessments.

### III. Exposure Analysis

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Due to the City of Vernon's inland location, and after consultation with FDEP staff, it was not deemed vulnerable to sea-level rise or storm surge hazards. Therefore, those risks were not analyzed as part of the Vulnerability Assessment. Inland communities should, however, remain aware of how hazards like sea level rise can transform water levels along rivers and should continue to evaluate potential impacts in the future.



*City of Vernon in relation to category 1-5 storm surge (left) and intermediate-high sea level rise (right).*

For the City of Vernon, the primary means of analysis was to evaluate the extent of rainfall-induced flood risks.

## Modeling Process

Rainfall-induced flooding was modeled using the Inundate! Tool. Inundate! was developed by FlynnMetrics, LLC and is based upon previous inundation tools developed for the Florida Division of Emergency Management's Statewide Regional Evacuation Study Program. It runs as an add-on within Esri's ArcView Desktop software, and the rainfall model module utilizes Esri's ArcHydro tools.

Multiple input data variables and user-defined parameters work together to create possible flood scenarios for three inundation types: Storm Surge from hurricanes, Sea Level Rise from climate change, and Inland Rain Flooding from future precipitation. As noted above, because Vernon is not deemed vulnerable to storm surge or sea level rise, this Vulnerability Assessment focuses only on inland flooding from precipitation.

### Model Inputs:

- Digital Elevation Model (DEM) raster
  - Florida Peninsular Hurricane Michael Supplemental (2020), 2.5ft resolution
- Soil Survey Geographic Database (SURGO) raster - Soil Conservation Service
- Land Use Land Cover (LULC) raster - USGS
- Rain Surface raster – NWS 24hr100yr and NWS 24hr500yr
- Change Factor raster - CORDEX 24hr100yr NEAR (2040) and CORDEX 24 hr100yr FAR (2070)
- Impervious Surfaces - NOAA
- Lake Points – USGS NHD w/user edits
- Relation Tables:
  - Soil Component table
  - Soil Aggregate table
  - Runoff table
- Burn Line layers - USGS NHD and user-defined

The Inundate! Tool produces output comprised of two parts based on the hydrology modeling used. One part is a flow model that uses a hybrid combination of dendritic (stream and synthetic stream) and deranged (lake and wetland) hydrology to produce the inundation in the associated watershed catchments. The other part is ponding, or sometimes called blue-spot hydrology, which is based solely on water gathering and filling depressions with no flow involved.

### Model Outputs:

- Water Bodies (Lakes, Rivers, Flat Water Areas)
- Swamps
- Drainage Flow Depth

- Ponding Depth

It is important to note that Inundate! is not an engineering scale model. It is surface based with no attention to sub-surface stormwater infrastructure. The inundation output data is used by the project team in the screening process to determine possible areas where future extreme rain events may result in hazardous flooding. It is most useful at the local government scale to identify where communities may want to carry out more detailed engineering assessments for infrastructure improvement strategies. Like all models, results are only approximations and should be used for planning purposes only.

## Scenarios

The following Rainfall-Induced Flood Scenarios were modeled using the Inundate! GIS Tool. They are aimed at providing future extreme conditions, with corresponding future flooding results.

### Near-Term 2040 Planning Horizon:

- 100-year, 24-hour rainfall event
- 500-year, 24-hour rainfall event

### Far-Term 2070 Planning Horizon:

- 100-year, 24-hour rainfall event
- 500-year, 24-hour rainfall event

The maximum precipitation over the modeled area for each scenario is shown in Table 9.

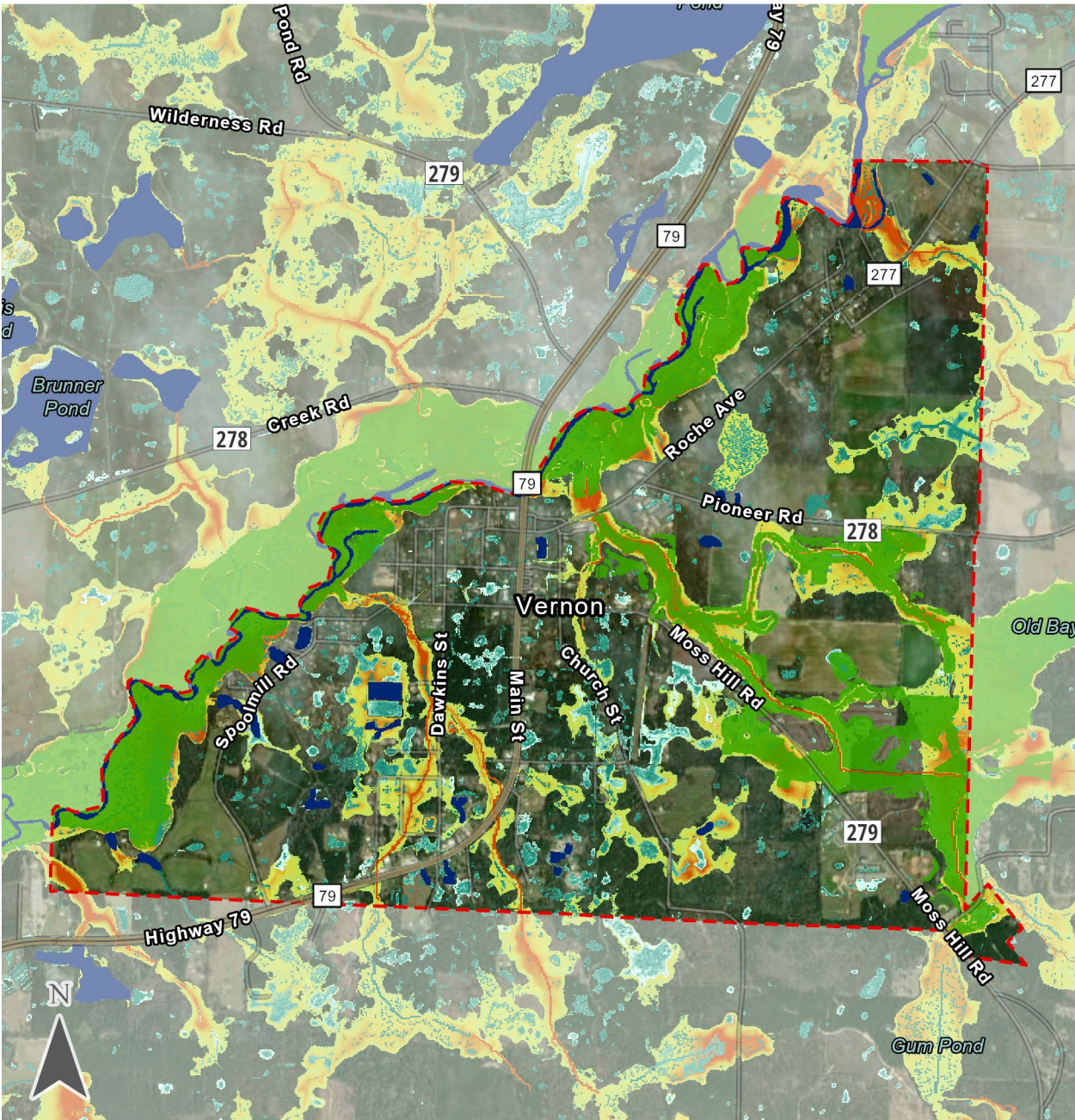
**Table 9. Maximum Precipitation by Rainfall Scenario**

24-Hour Rainfall Scenario	100-Year		500-Year	
	2040	2070	2040	2070
Maximum Precipitation (inches)*	19.30"	22.54"	26.41"	30.87"

*\*over the modeled area*

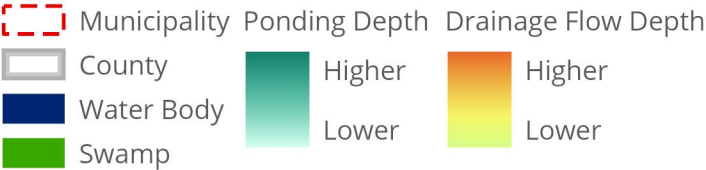
Figures 5-8 illustrate the Inundate! outputs for each of the four modeled scenarios.

Figure 5. 100-Year, 24-Hour Rainfall – 2040 Scenario



City of Vernon - 100-Year, 24-Hour Rainfall Flooding - 2040 Scenario

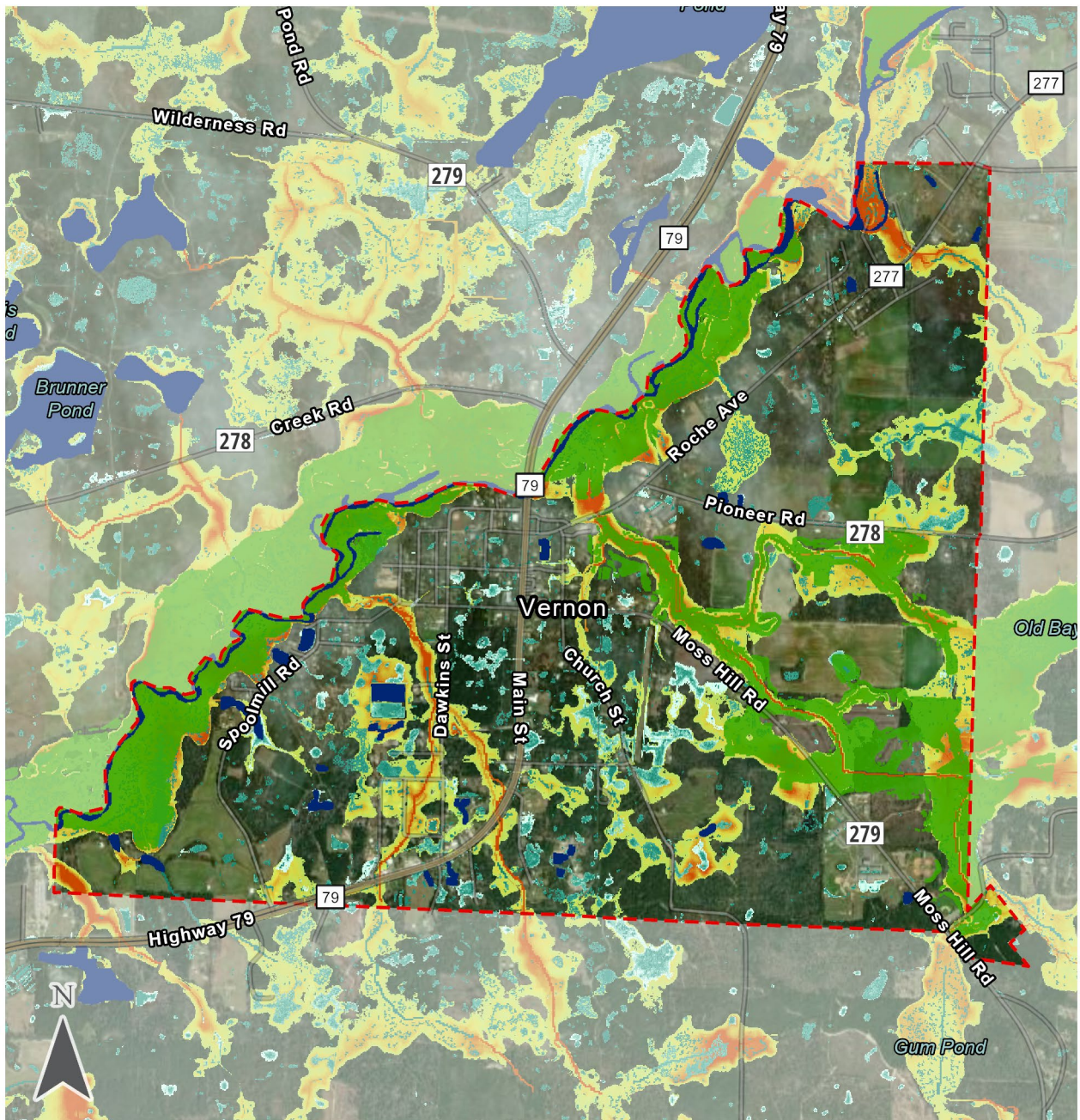
7/8/2024



*Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.*

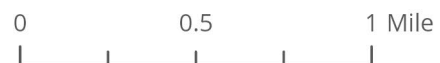
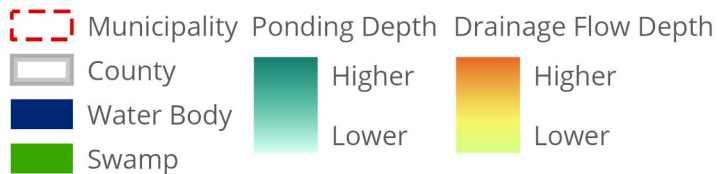
Source: ECRC, Basemap (FDEP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, State of Florida, Earthstar Geographics)

**Figure 6. 100-Year, 24-Hour Rainfall - 2070 Scenario**



**City of Vernon - 100-Year, 24-Hour Rainfall Flooding - 2070 Scenario**

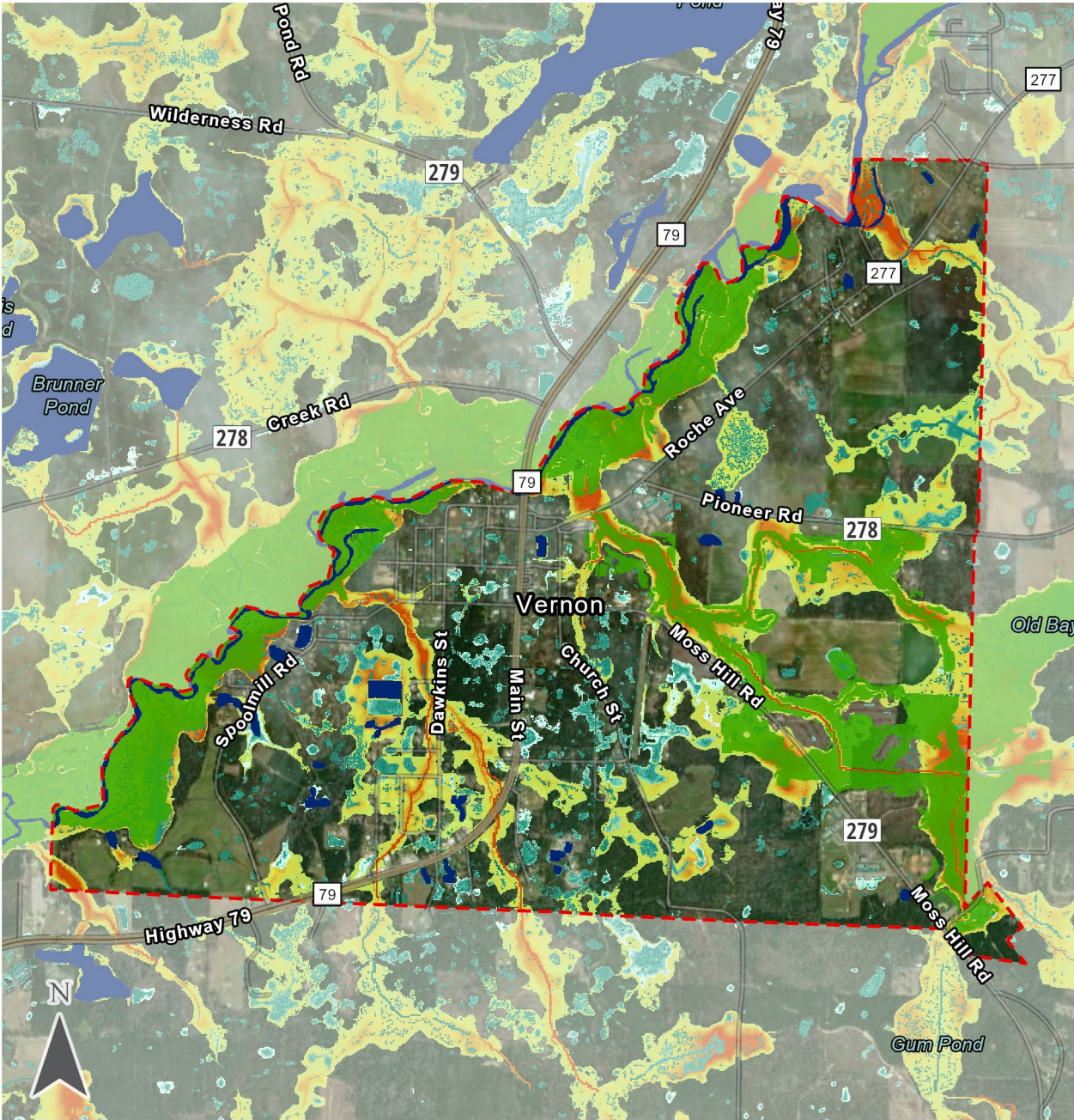
7/8/2024



*Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.*

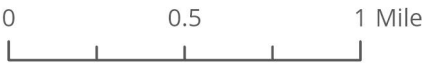
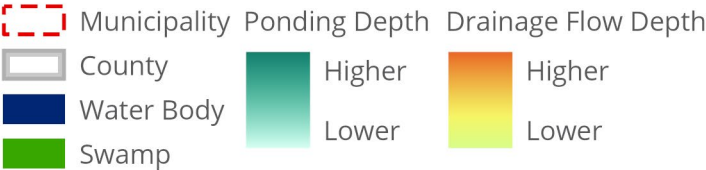
Source: ECRC, Basemap (FDEP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, State of Florida, Earthstar Geographics)

Figure 7. 500-Year, 24-Hour Rainfall Flooding - 2040 Scenario



City of Vernon - 500-Year, 24-Hour Rainfall Flooding - 2040 Scenario

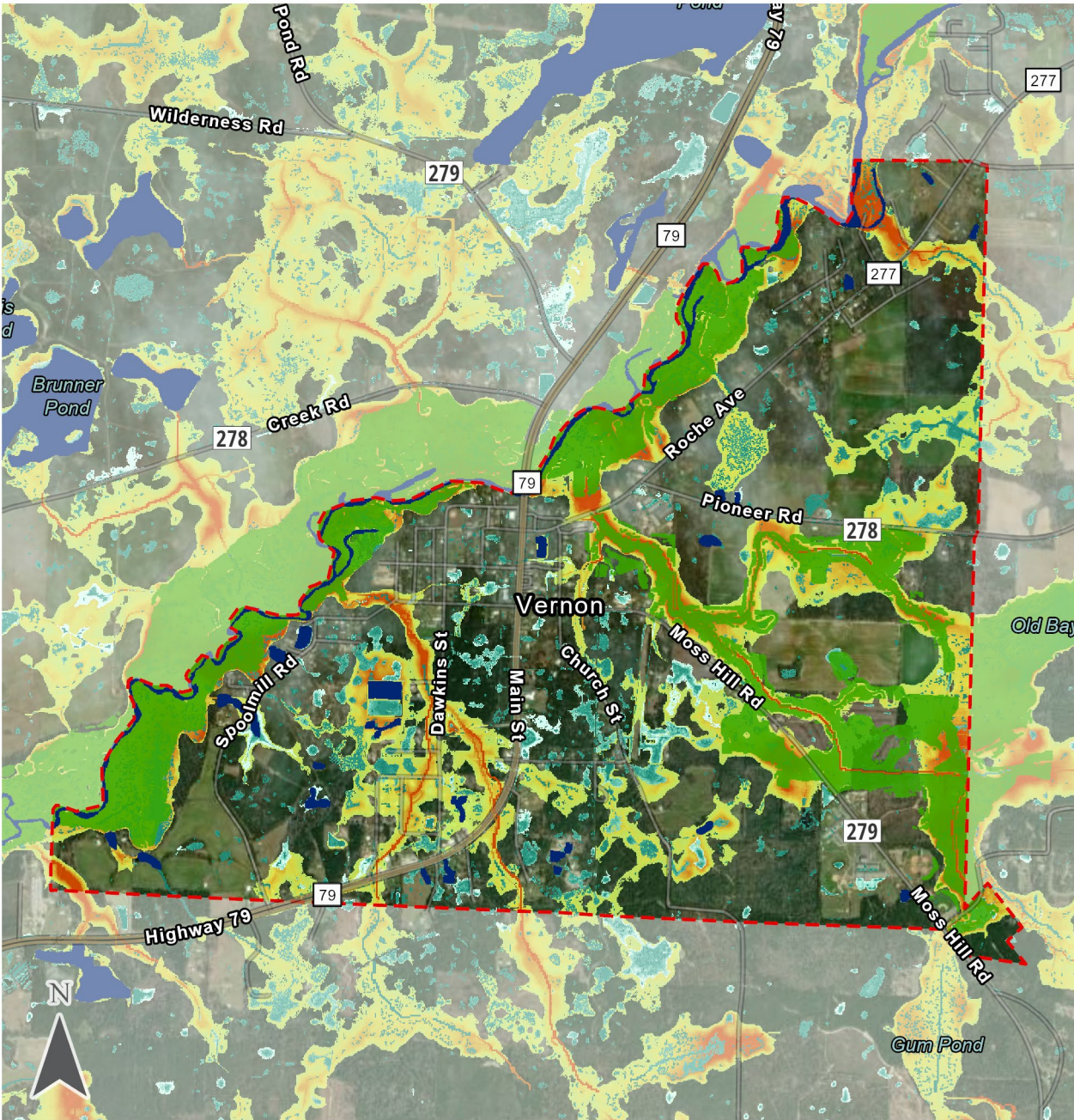
7/8/2024



*Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.*

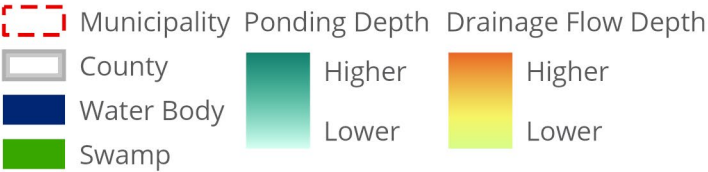
Source: ECRC, Basemap (FDEP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, State of Florida, Earthstar Geographics)

Figure 8. 500-Year, 24-Hour Rainfall Flooding - 2070 Scenario



City of Vernon - 500-Year, 24-Hour Rainfall Flooding - 2070 Scenario

7/8/2024



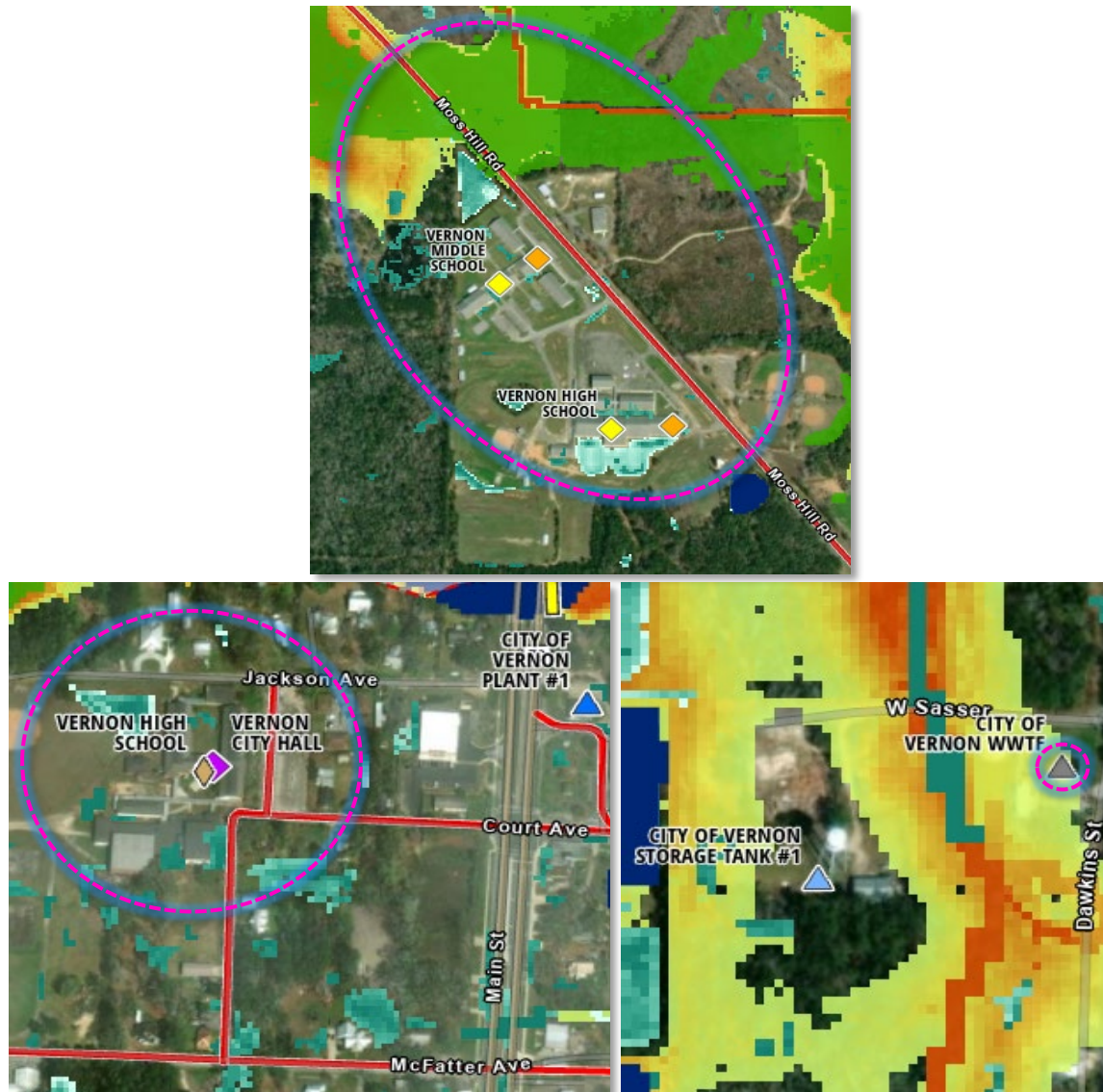
*Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.*

Source: ECRC, Basemap (FDEP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS, State of Florida, Earthstar Geographics)

## IV. Sensitivity Analysis

The Sensitivity Analysis measures the impact of modeled flooding on the identified critical assets. The aim is to evaluate the severity of flooding impacts on each asset under the four modeled flood scenarios.

Exposure of the assets (identified in Tables 1 and 2) was evaluated against each flood type and scenario by using a GIS overlay approach, where the mapped flooding extents were overlaid on top of assets. Figures 9-24 illustrate the modeled rainfall flooding scenarios in relation to the identified critical assets. Details of key assets are included below.



Rainfall flooding (circled) at Vernon Middle/High Schools and along Moss Hill Rd (Top), at Vernon City Hall/Old High School (Bottom L), and at Wastewater Treatment Facility (Bottom R) in the 500-year 2070 rainfall scenario.

Table 10 categorizes the risk levels of critical assets by evaluating the percentage of assets exposed to flooding under various scenarios. Risk levels—None, Low, Medium, High, and Extreme—are assigned based on the percentage of affected assets in each asset class. These percentages may be somewhat misleading given the small number of identified assets overall, but they provide a metric that allows prioritization of future adaptation actions.

**Table 10. Risk Assessment Percentages**

<b>Risk Assessment</b>	<b>Critical Assets Affected (% of Total Assets within each Asset Class)</b>
None	0%
Low	1-25%
Medium	26 – 50%
High	51 – 75%
Extreme	>75%

Assets within each of the four asset classes are potentially affected by future inundation in the City of Vernon. These include roadways, the City’s wastewater treatment facility, Vernon Middle and High Schools as well as the Vernon City Hall.

Flooding can cause both immediate and long-term damage to roadways. In the short term, inundated roads can become impassable, disrupting daily traffic and potentially stranding vehicles. Over time, frequent or prolonged flooding can degrade the structural integrity of roadways, leading to issues such as road base erosion, pavement weakening, and potholes and cracks. This deterioration can increase maintenance costs and lead to more frequent road closures, reducing the reliability of the transportation network. Additionally, standing water on road surfaces can increase the likelihood of accidents and reduce the lifespan of road materials, further escalating repair and replacement costs.

In extreme cases, inundation of wastewater treatment facilities and lift stations can lead to the spillage of untreated or partially treated sewage into nearby water bodies, posing significant risks to public health and the environment. Lift stations, which rely on electrical components to pump sewage, are particularly vulnerable to flooding, as water infiltration can cause mechanical failures and disrupt operations. Over time, frequent flooding can damage infrastructure including pumps, motors, and electrical systems, leading to increased maintenance costs, reduced operational efficiency, and, potentially, extended downtimes during critical periods.

Inundation can make school buildings unusable or, at the very least, inaccessible, forcing closures and displacing students and staff. This disruption can extend beyond the immediate period of inundation, as water damage to buildings, furniture, and educational materials may

necessitate extensive repairs and replacements. Over time, repeated flooding can degrade the structural integrity of school facilities, increase maintenance costs, and potentially require relocation or reconstruction of school buildings. Additionally, schools often serve as emergency shelters during disasters, so their inaccessibility due to flooding can hinder community disaster response efforts.

Similarly flooding in and around government facilities can temporarily disrupt the overall functioning of local government, leading to delays in decision-making and response actions.

Inundation at cemeteries can lead to the displacement of soil, erosion of burial plots, and in extreme cases exposure or displacement of remains. Floodwater can also damage headstones, markers, and other memorials, necessitating costly restoration. Over time, repeated flooding can degrade the landscape, causing ongoing erosion and making the site more vulnerable to future flood events. For the time being, the modeled flooding at the Vernon Cemetery is relatively minor, but it should be further evaluated to avoid future negative effects.

Overall, there are two of seven Transportation Assets (29%), one of five Critical Infrastructure Assets (20%), three of six Community Facilities (50%), and one of three Historical Resources (33%) exposed to flooding in the four extreme rainfall scenarios (see Table 11). These percentages are consistent across all four modeled scenarios, although the depths of projected inundation are higher in the 500-year scenarios. The Town of Vernon's Critical Infrastructure is overall categorized as 'Low' risk, while Transportation Assets, Community Facilities and Natural Resources are 'Medium' risk. It should be noted that a relatively small number of assets overall were included in the analysis.

Of the affected assets (Table 12), the modeled flood depths are highest near Vernon Middle School, Vernon High School, CR 279/Moss Hill Road, and Vernon City Hall (Old High School). Upon consultation with Washington County staff, the Vernon Wastewater Treatment Facility was assigned the highest priority due to firsthand accounts of severe flooding at the facility. CR 279/Moss Hill Road was assigned second priority, followed by the schools, Vernon City Hall, CR 278/Pioneer Road, and the Vernon Cemetery.

**Table 11. Percentage of Critical Assets Affected by Asset Class and Scenario**

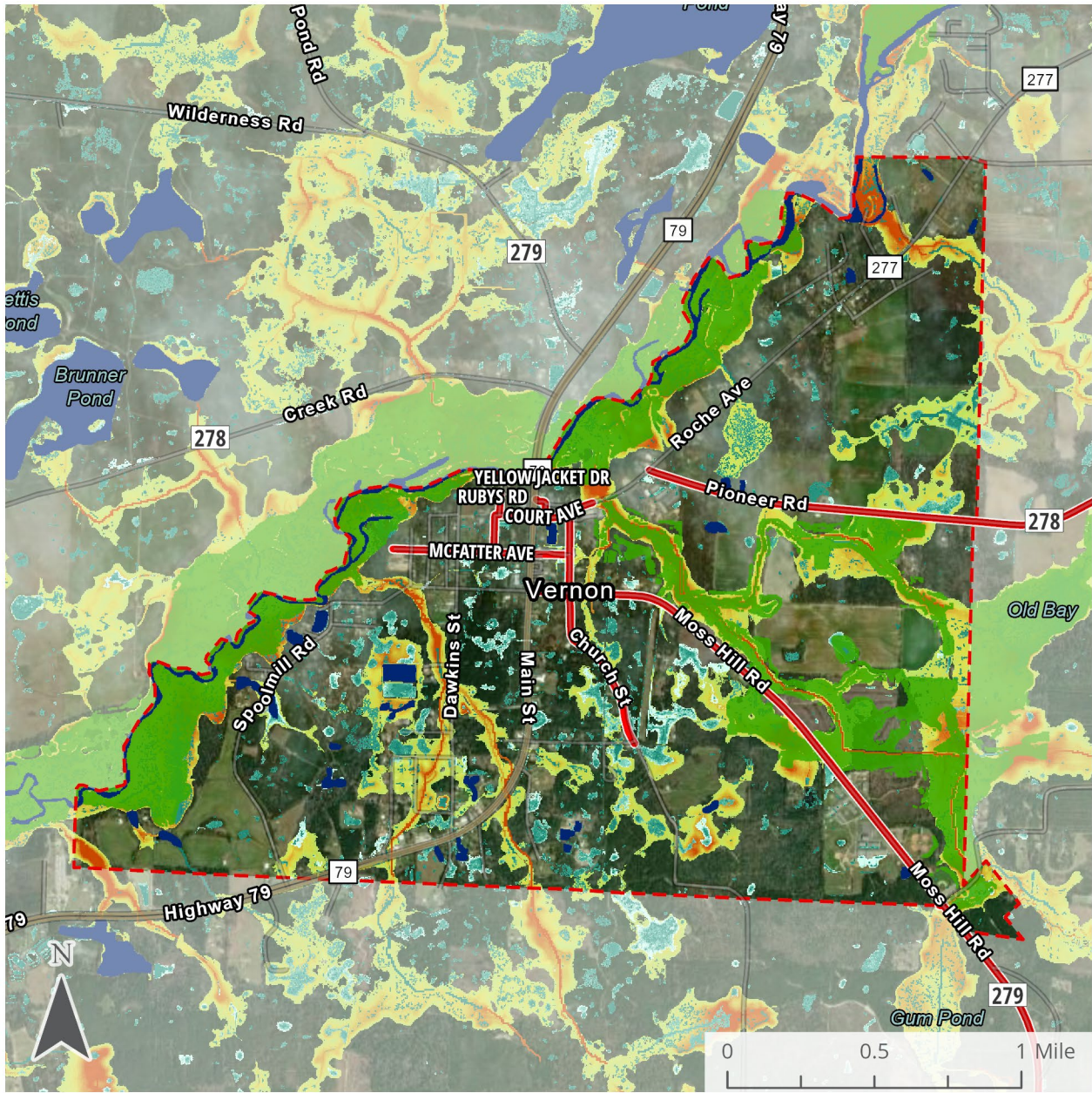
Asset Class	Critical Assets Evaluated	Assets Affected by Rainfall Scenario			
		100-Year		500-Year	
		2040	2070	2040	2070
Transportation Assets and Evacuation Routes	7	2 (29%)	2 (29%)	2 (29%)	2 (29%)
Critical Infrastructure	5	1 (20%)	1 (20%)	1 (20%)	1 (20%)
Critical Community and Emergency Facilities	6	3 (50%)	3 (50%)	3 (50%)	3 (50%)
Natural, Cultural, and Historical Resources	3	1 (33%)	1 (33%)	1 (33%)	1 (33%)

**Table 12. Flood Depths by Scenario for Affected Assets**

Asset (in Priority Order)	Asset Class	Address	Finished Floor Elevation	Rainfall Scenario Flood Depth*			
				100-Year		500-Year	
				2040	2070	2040	2070
1. CITY OF VERNON WWTF	Critical Infrastructure	2964 Dawkins St	Not available	0.99'	1.17'	1.32'	1.57'
2. CR 279/MOSS HILL RD	Transportation Assets and Evacuation Routes	Just NW of Vernon Middle School property	NA	1.06'	1.20'	2.15'	2.40'
3. VERNON HIGH SCHOOL	Critical Community and Emergency Facilities	3232 Moss Hill Rd	Not available	1.78'	1.97'	2.36'	2.62'
4. VERNON MIDDLE SCHOOL	Critical Community and Emergency Facilities	3190 Moss Hill Rd	Not available	1.78'	1.97'	2.36'	2.61'
5. VERNON CITY HALL (OLD HIGH SCHOOL)	Critical Community and Emergency Facilities	2808 Yellow Jacket Dr	Not available	1.77'	1.94'	2.35'	2.58'
6. CR 278/PIONEER RD	Transportation Assets and Evacuation Routes	Just west of Vernon City Limit	NA	0.94'	1.11'	1.35'	1.57'
7. VERNON CEMETERY	Natural, Cultural, and Historical Resources	3263 Court Ave	NA	1.77'	1.94'	2.35'	2.58'

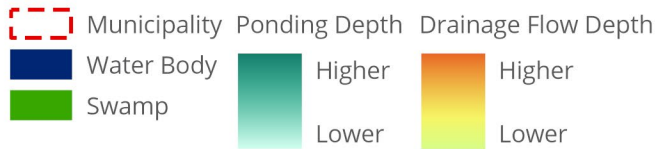
\*Depths for linear (roadway) and polygon (cemetery) features are maximum modeled depths across the length or area within the city limits.

Figure 9. Transportation and Evacuation Routes – 100-Year, 2040 Scenario



City of Vernon - 100-Year, 24-Hour Rainfall Flooding - 2040 Scenario  
Transportation and Evacuation Routes

— Major Roadways

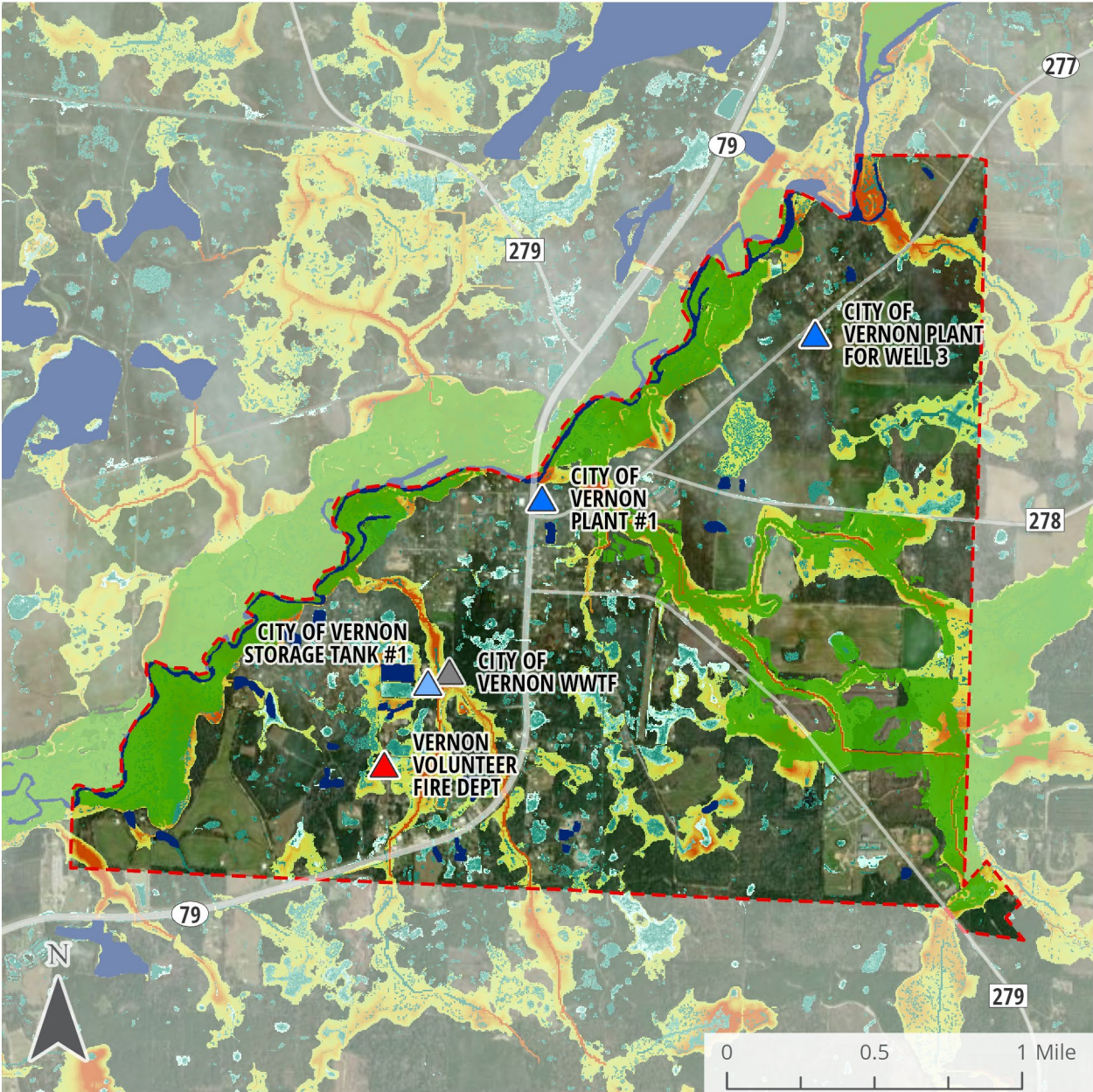


Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.

Source: ECRC, FDEP, City of Vernon

7/3/2024

Figure 10. Critical Infrastructure – 100-Year, 2040 Scenario



City of Vernon - 100-Year, 24-Hour Rainfall Flooding - 2040 Scenario

Critical Infrastructure

- ▲ Wastewater Treatment Facilities & Lift Stations
- ▲ Drinking Water Facilities
- ▲ Water Utility Conveyance Systems
- ▲ Solid and Hazardous Waste Facilities

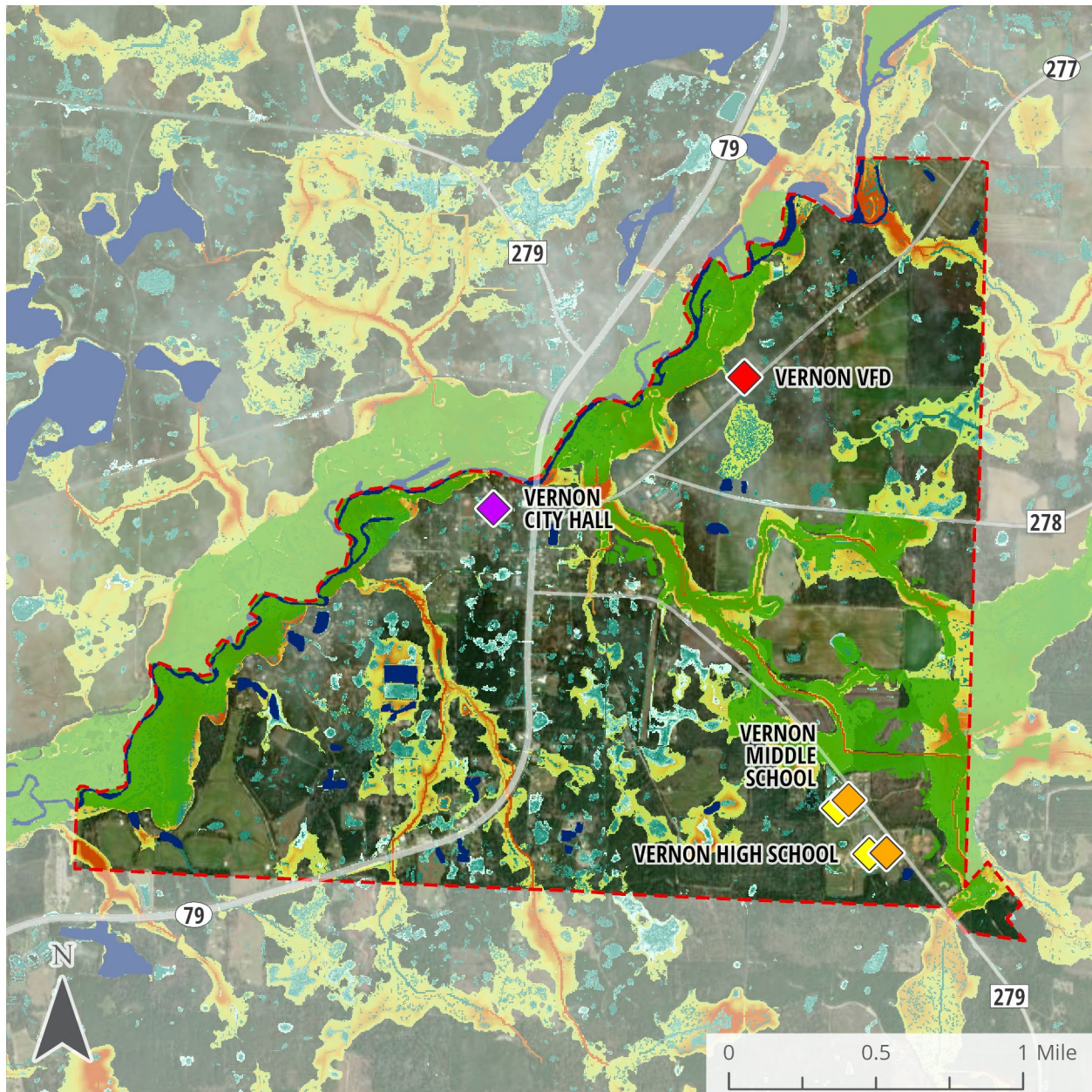
— Municipality	Ponding Depth	Drainage Flow Depth
Water Body	Higher	Higher
Swamp	Lower	Lower

Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.

Source: ECRC, FDEP, City of Vernon

7/3/2024

**Figure 11. Critical Community & Emergency Facilities - 100-Year, 2040 Scenario**



**City of Vernon - 100-Year, 24-Hour Rainfall Flooding - 2040 Scenario**

**Critical Community & Emergency Facilities**

- ◆ Schools
- ◆ Fire Stations
- ◆ Local Government Facilities
- ◆ Risk Shelters

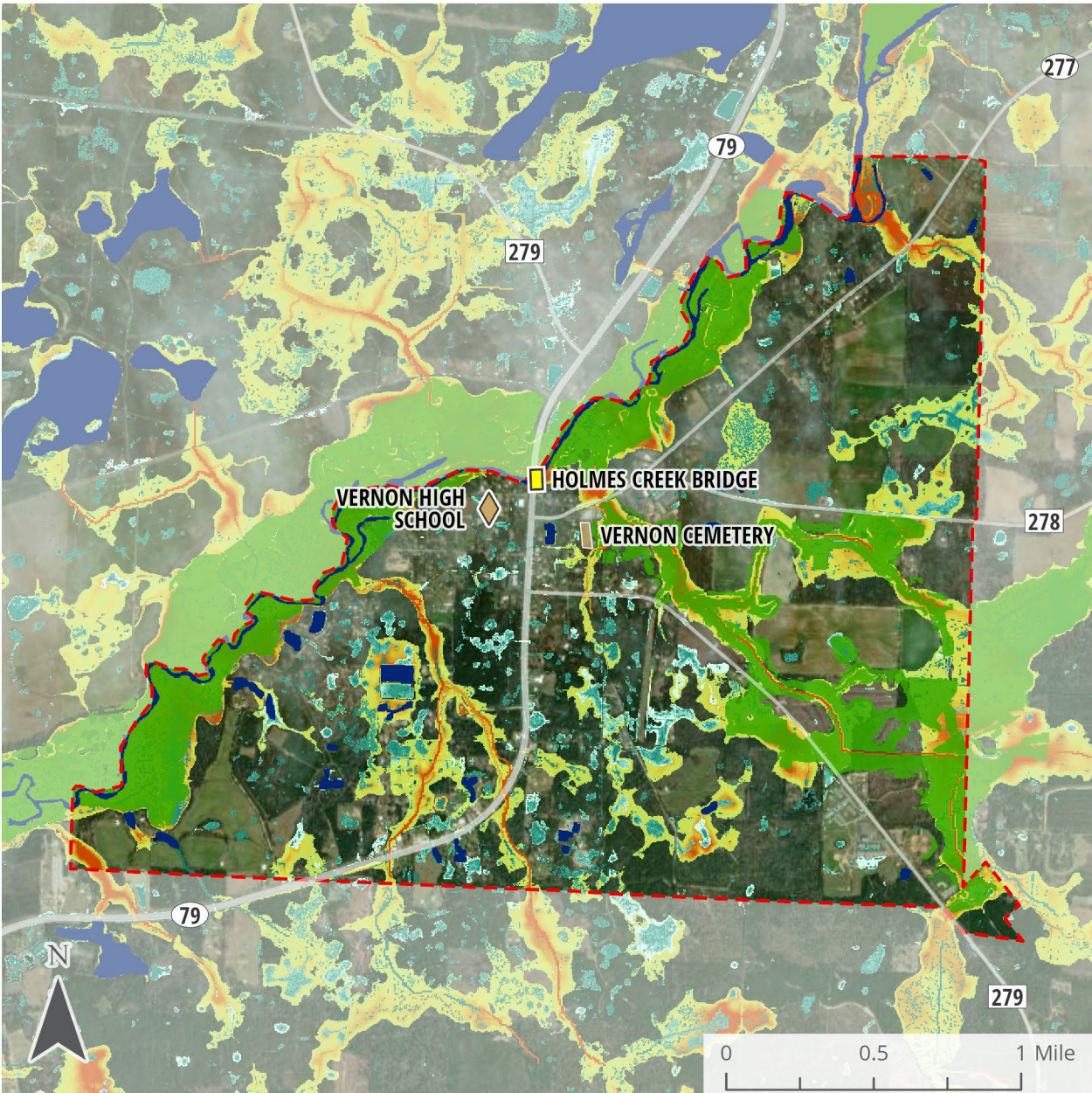
- Municipality
- Water Body
- Swamp
- Higher
- Lower
- Higher
- Lower

*Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.*

Source: ECRC, FDEP, City of Vernon

7/3/2024

Figure 12. Natural, Cultural, and Historical Resources - 100-Year, 2040 Scenario



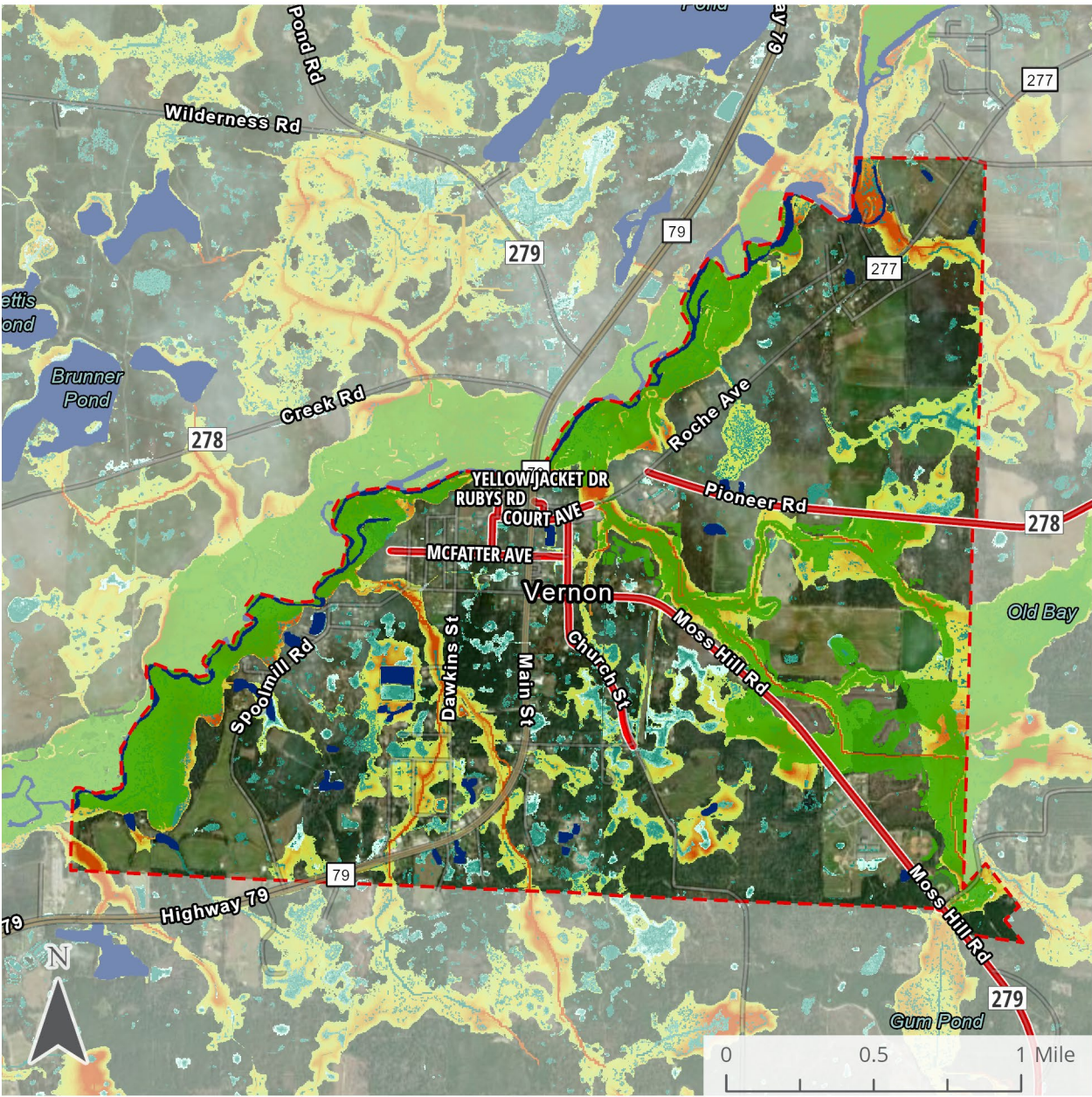
City of Vernon - 100-Year, 24-Hour Rainfall Flooding - 2040 Scenario  
Natural, Cultural, and Historical Resources



*Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.*

Source: ECRC, FDEP, City of Vernon 7/3/2024

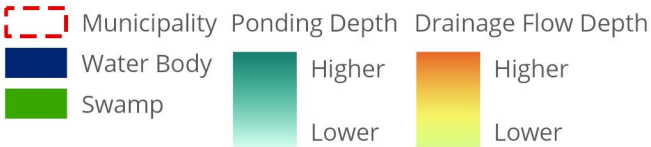
Figure 13. Transportation and Evacuation Routes - 100-Year, 2070 Scenario



City of Vernon - 100-Year, 24-Hour Rainfall Flooding - 2070 Scenario

Transportation and Evacuation Routes

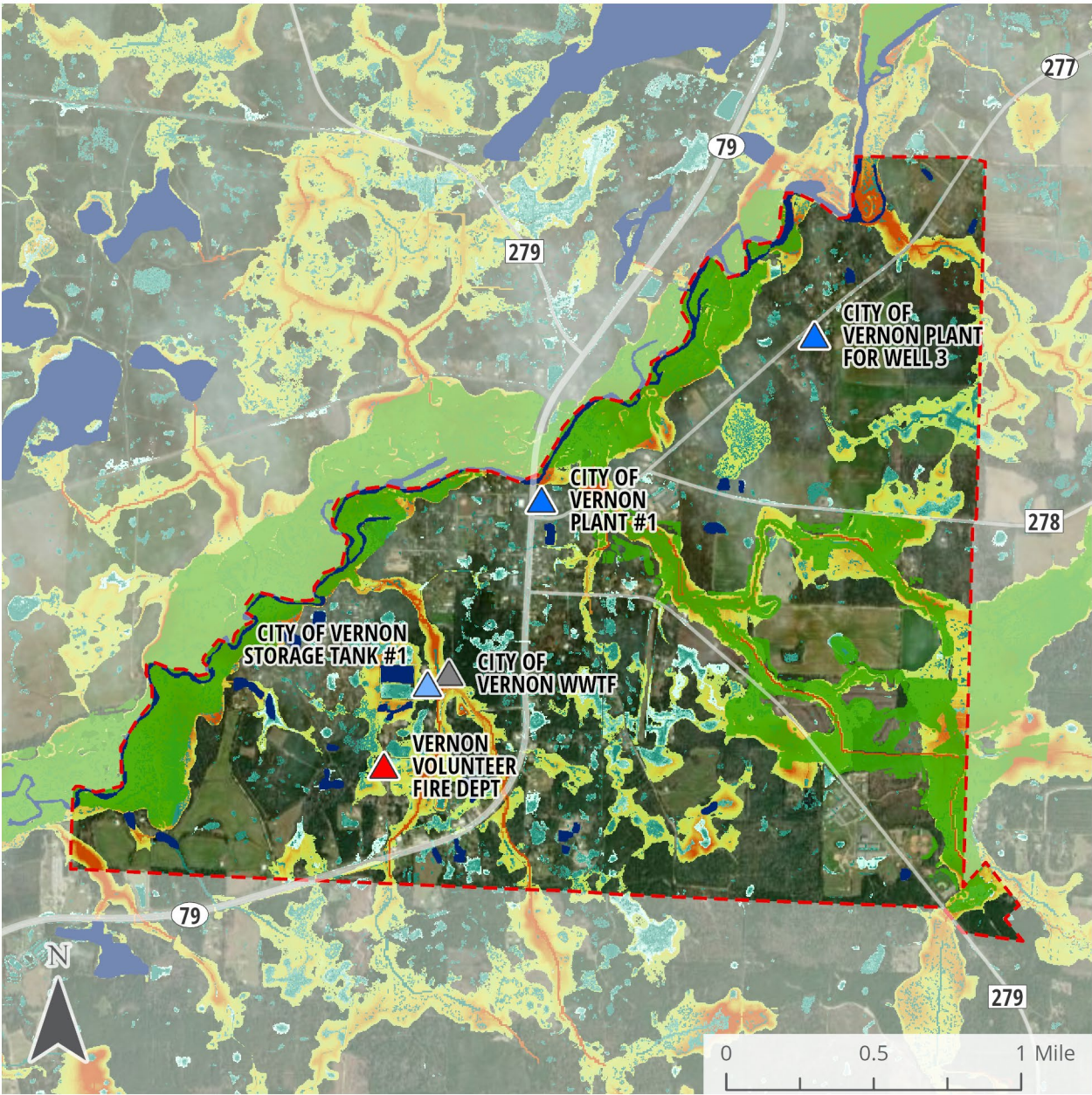
Major Roadways



Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.

Source: ECRC, FDEP, City of Vernon 7/3/2024

Figure 14. Critical Infrastructure - 100-Year, 2070 Scenario



City of Vernon - 100-Year, 24-Hour Rainfall Flooding - 2070 Scenario  
Critical Infrastructure

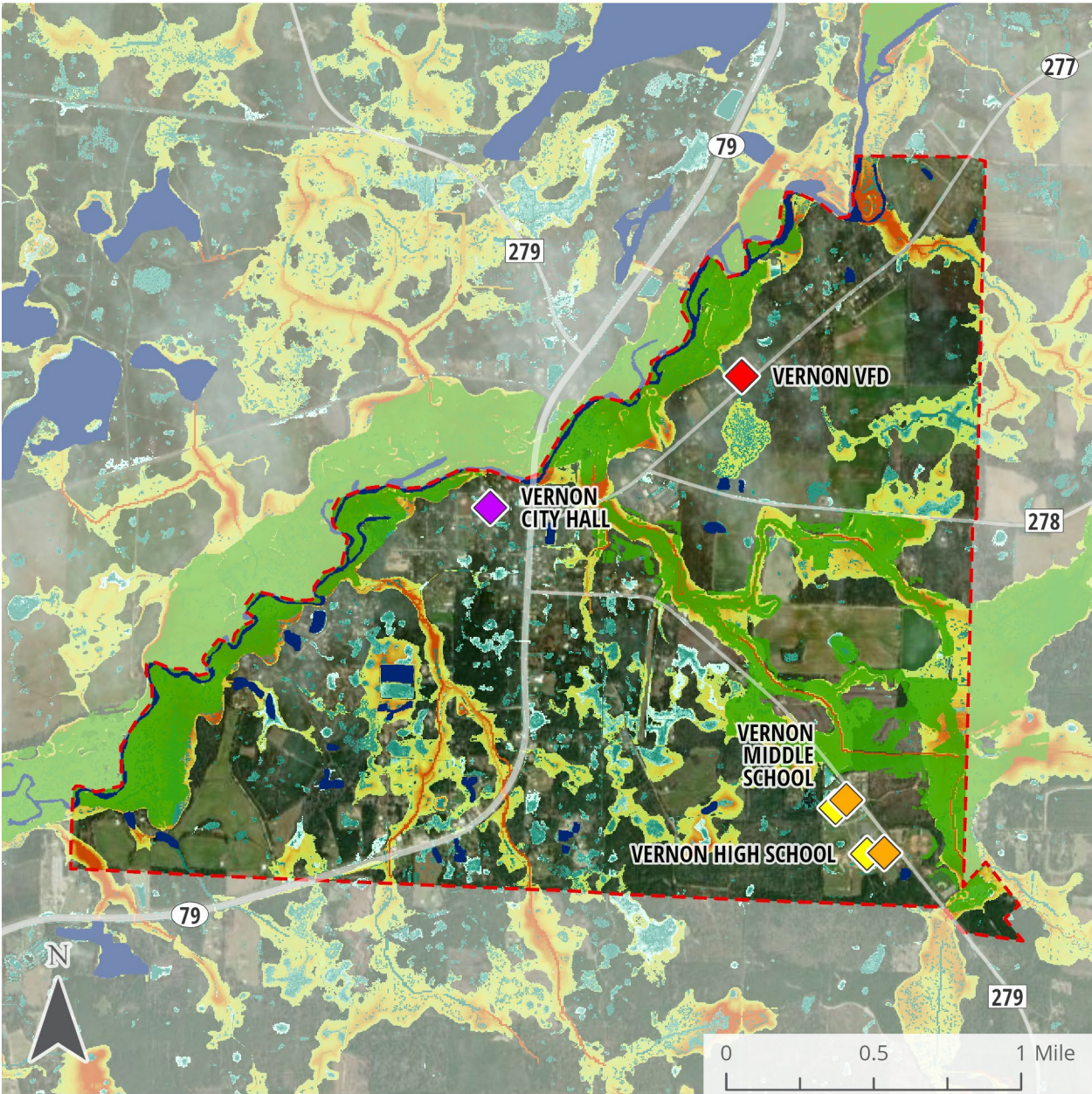
- ▲ Wastewater Treatment Facilities & Lift Stations
- ▲ Drinking Water Facilities
- ▲ Water Utility Conveyance Systems
- ▲ Solid and Hazardous Waste Facilities

	Municipality	Ponding Depth	Drainage Flow Depth
	Water Body	Higher	Higher
	Swamp	Lower	Lower

Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.

Source: ECRC, FDEP, City of Vernon 7/3/2024

Figure 15. Critical Community & Emergency Facilities - 100-Year, 2070 Scenario



City of Vernon - 100-Year, 24-Hour Rainfall Flooding - 2070 Scenario  
Critical Community & Emergency Facilities

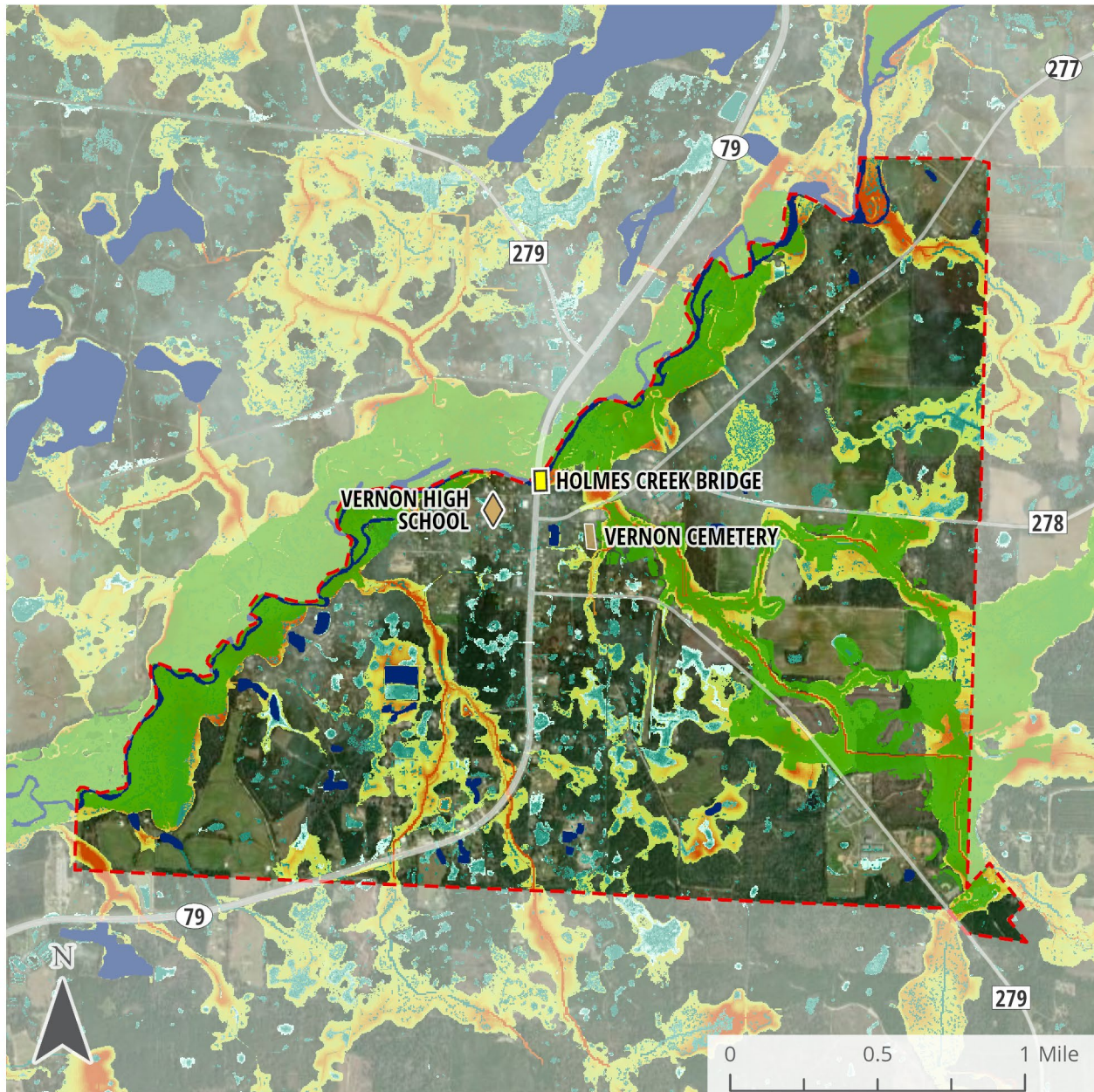
- Schools
- Fire Stations
- Local Government Facilities
- Risk Shelters

- |              |            |       |                                  |                                        |
|--------------|------------|-------|----------------------------------|----------------------------------------|
| Municipality | Water Body | Swamp | Ponding Depth<br>Higher<br>Lower | Drainage Flow Depth<br>Higher<br>Lower |
|--------------|------------|-------|----------------------------------|----------------------------------------|

*Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.*

Source: ECRC, FDEP, City of Vernon 7/3/2024

**Figure 16. Natural, Cultural, and Historical Resources - 100-Year, 2070 Scenario**



**City of Vernon - 100-Year, 24-Hour Rainfall Flooding - 2070 Scenario  
Natural, Cultural, and Historical Resources**

- Historical and Cultural Assets
- Historical and Cultural Assets
- Historical and Cultural Assets

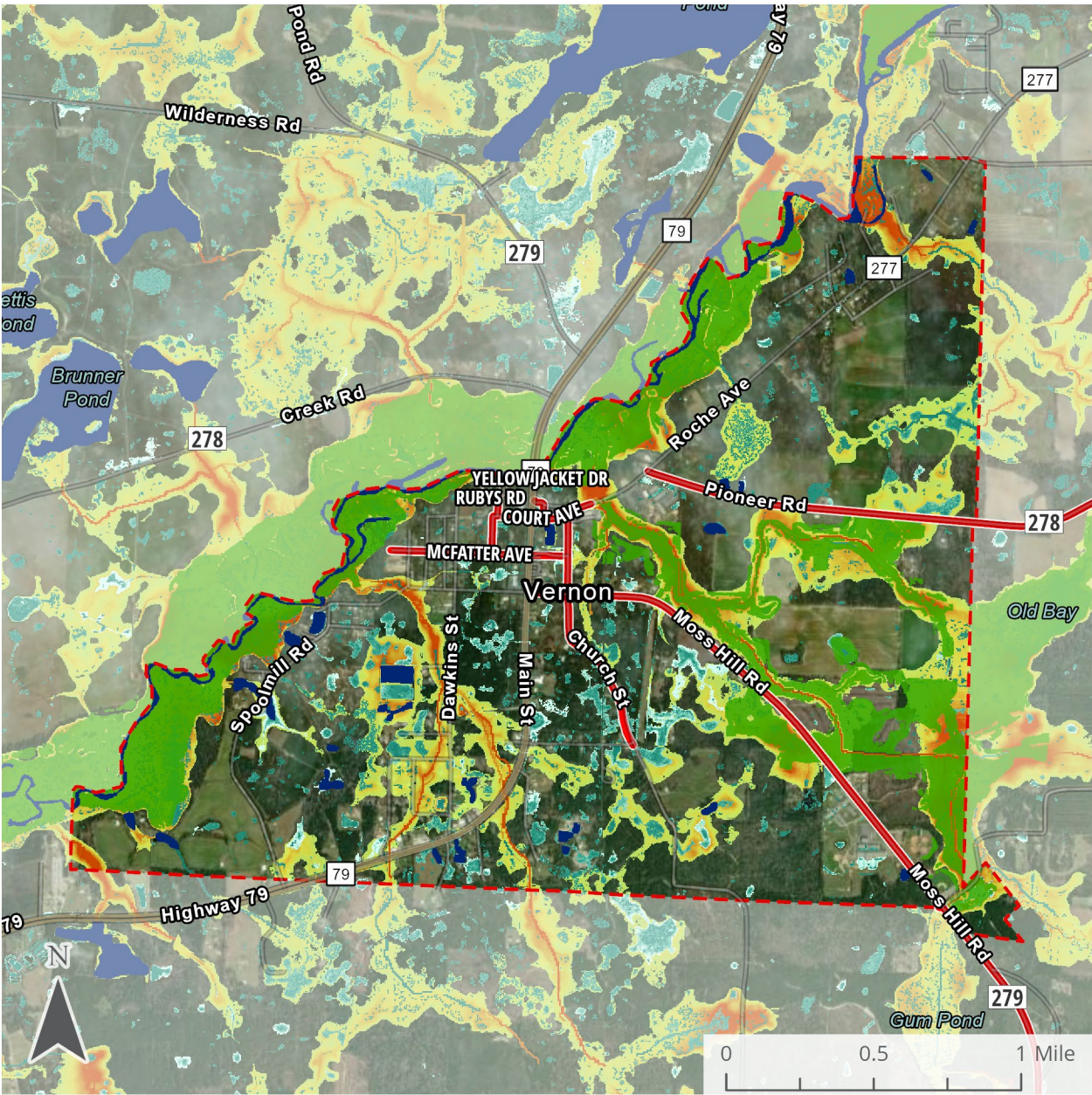
- Municipality
- Water Body
- Swamp
- Ponding Depth: Higher
- Ponding Depth: Lower
- Drainage Flow Depth: Higher
- Drainage Flow Depth: Lower

*Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.*

Source: ECRC, FDEP, City of Vernon

7/3/2024

Figure 17. Transportation and Evacuation Routes - 500-Year, 2040 Scenario



City of Vernon - 500-Year, 24-Hour Rainfall Flooding - 2040 Scenario  
Transportation and Evacuation Routes

— Major Roadways

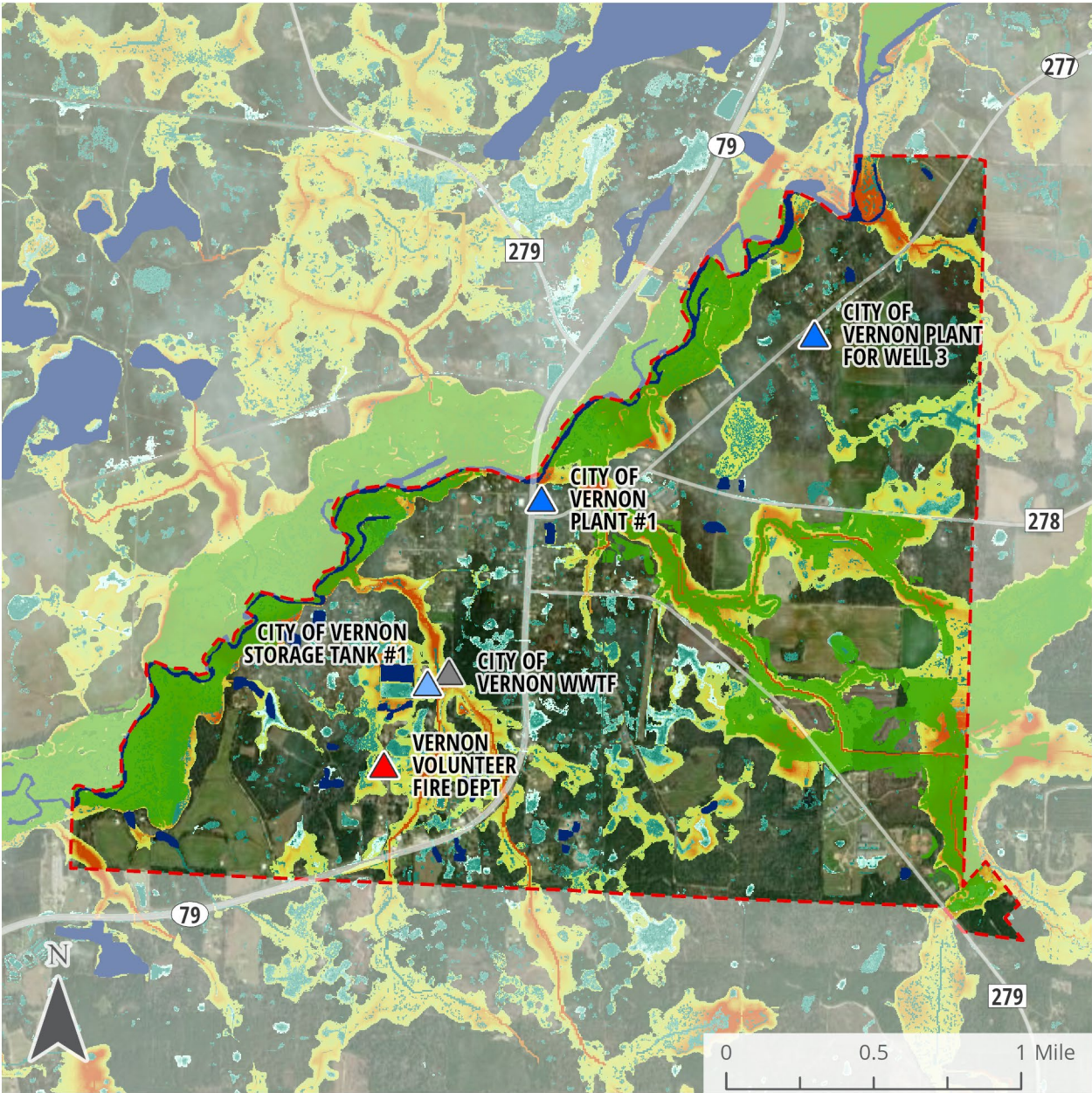
	Municipality		Ponding Depth		Drainage Flow Depth
	Water Body		Higher		Higher
	Swamp		Lower		Lower

*Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.*

Source: ECRC, FDEP, City of Vernon

7/3/2024

Figure 18. Critical Infrastructure - 500-Year, 2040 Scenario



City of Vernon - 500-Year, 24-Hour Rainfall Flooding - 2040 Scenario  
Critical Infrastructure

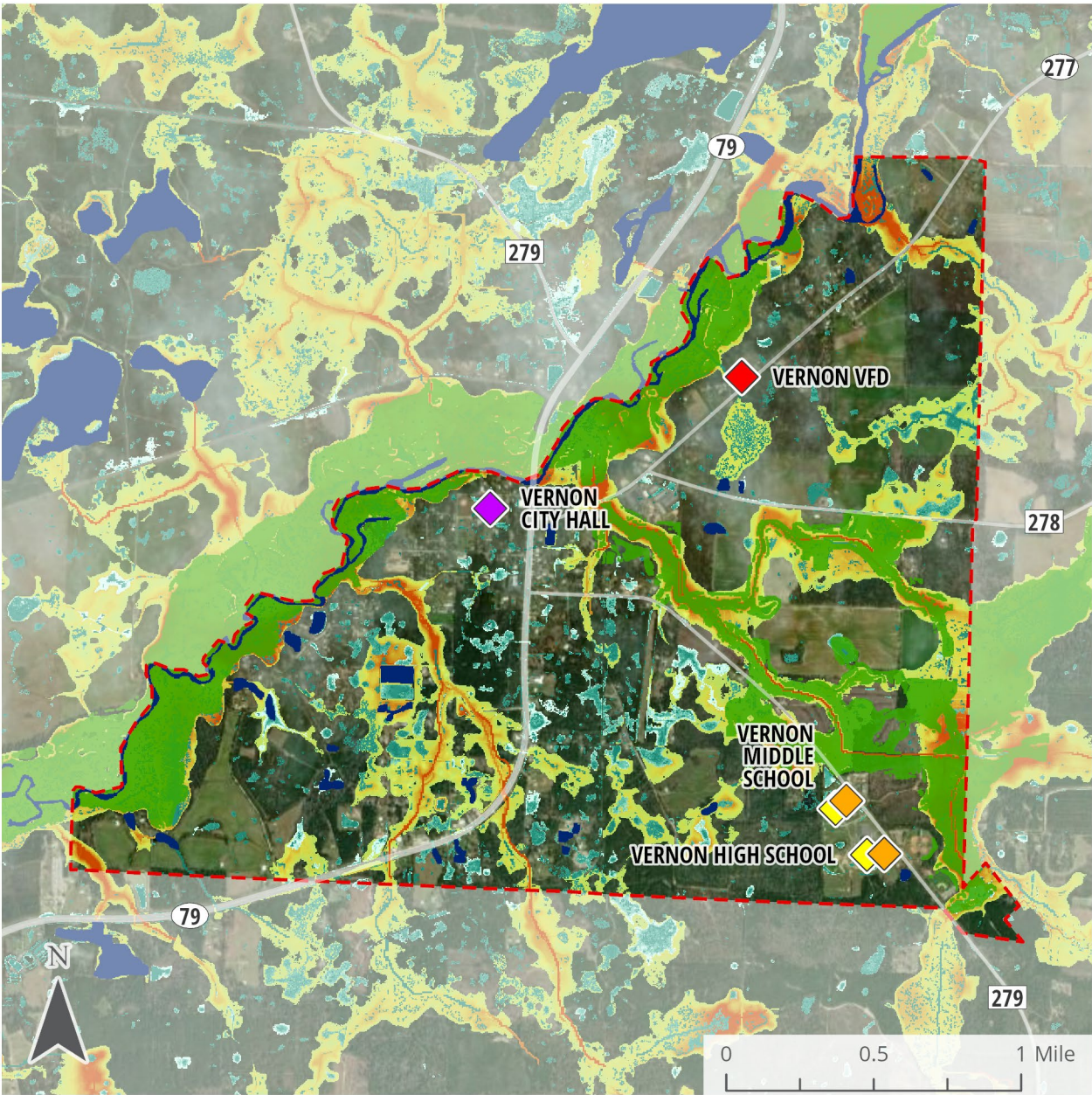
- |                                                   |                |                 |                       |
|---------------------------------------------------|----------------|-----------------|-----------------------|
| ▲ Wastewater Treatment Facilities & Lift Stations | ■ Municipality | ■ Ponding Depth | ■ Drainage Flow Depth |
| ▲ Drinking Water Facilities                       | ■ Water Body   | ■ Higher        | ■ Higher              |
| ▲ Water Utility Conveyance Systems                | ■ Swamp        | ■ Lower         | ■ Lower               |
| ▲ Solid and Hazardous Waste Facilities            |                |                 |                       |

*Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.*

Source: ECRC, FDEP, City of Vernon

7/3/2024

Figure 19. Critical Community & Emergency Facilities - 500-Year, 2040 Scenario



City of Vernon - 500-Year, 24-Hour Rainfall Flooding - 2040 Scenario

Critical Community & Emergency Facilities

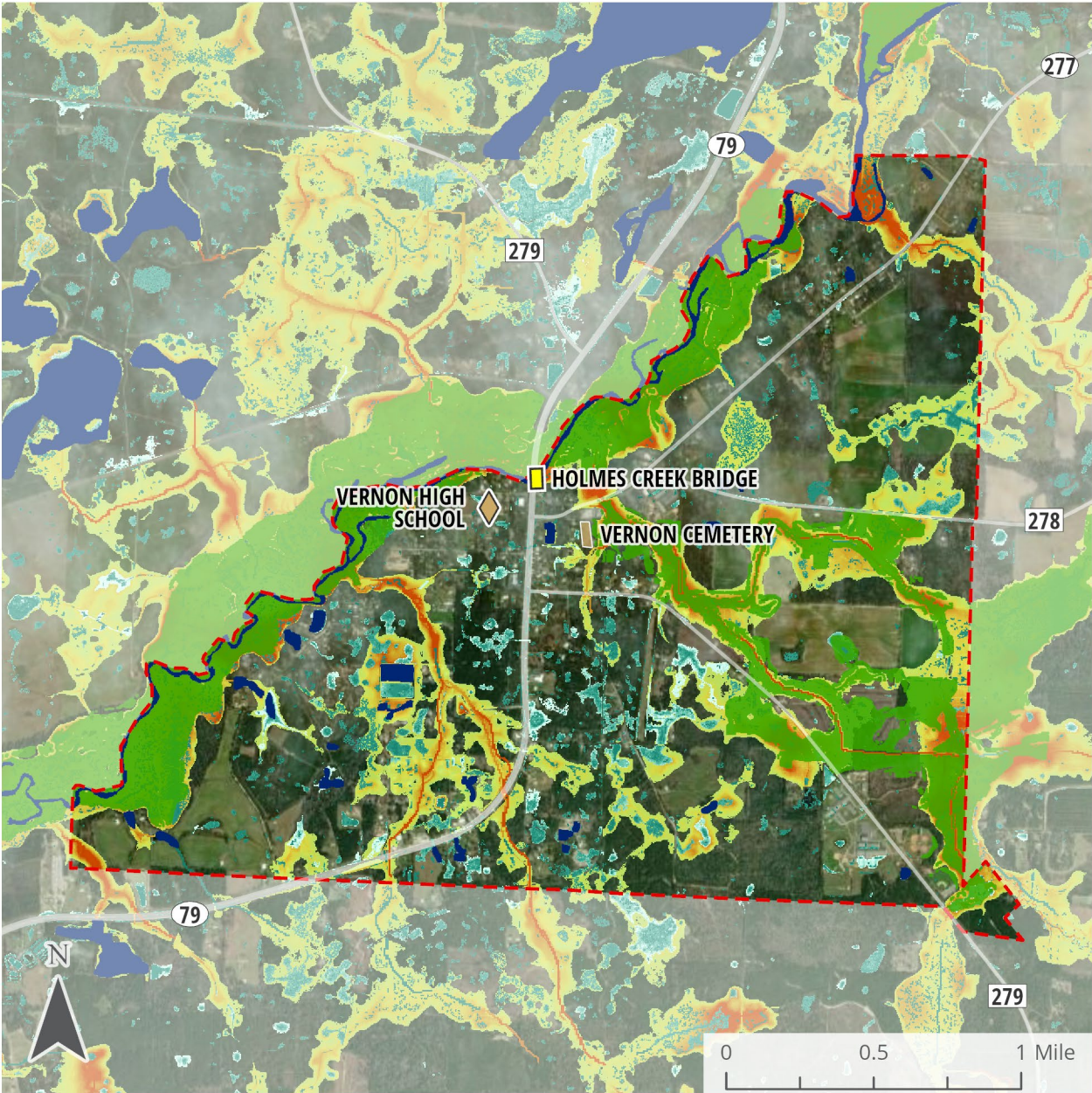
- Schools
- Fire Stations
- Local Government Facilities
- Risk Shelters

Municipality	Ponding Depth	Drainage Flow Depth
Water Body	Higher	Higher
Swamp	Lower	Lower

*Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.*

Source: ECRC, FDEP, City of Vernon 7/3/2024

Figure 20. Natural, Cultural, and Historical Resources - 500-Year, 2040 Scenario



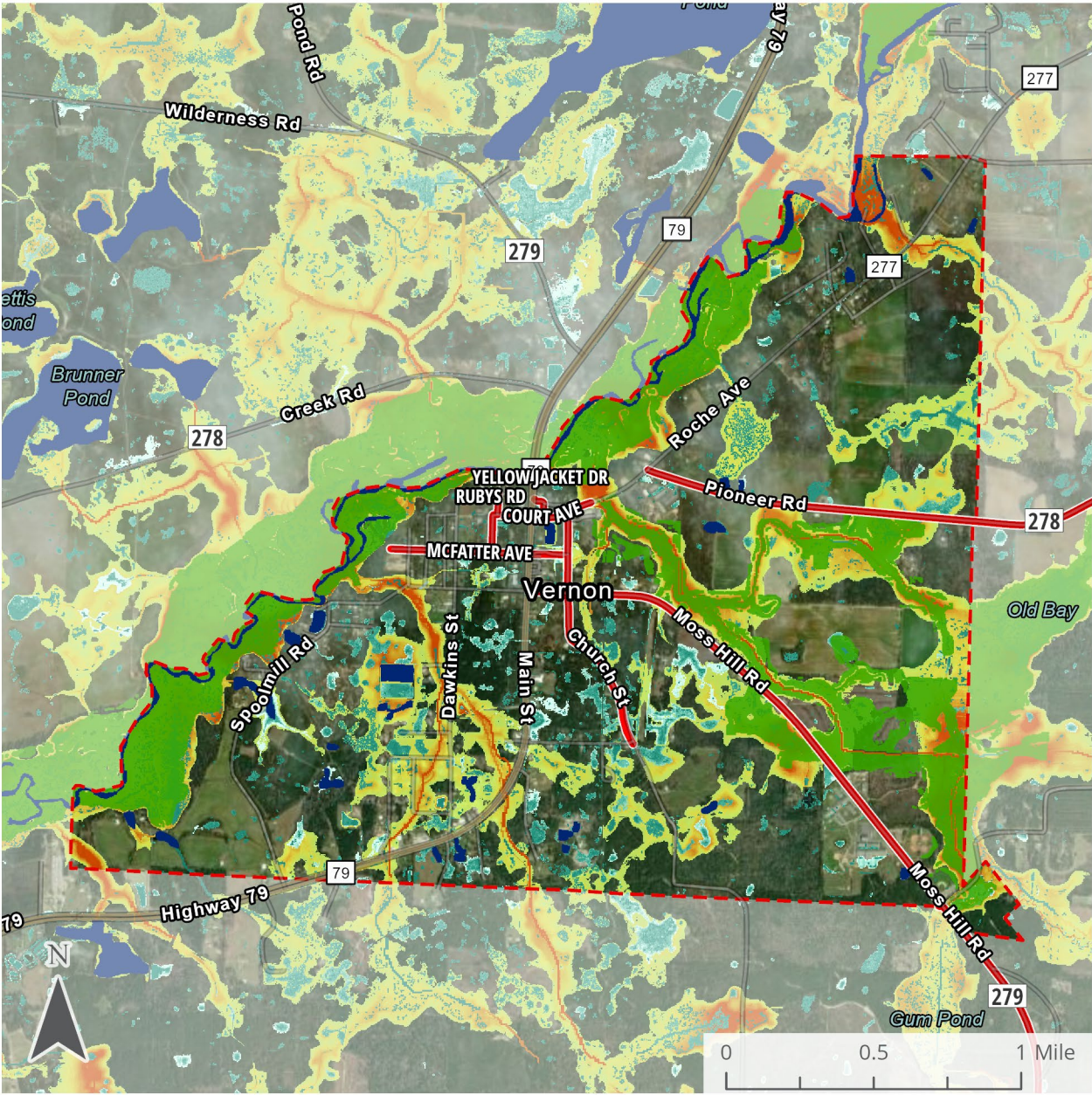
City of Vernon - 500-Year, 24-Hour Rainfall Flooding - 2040 Scenario  
Natural, Cultural, and Historical Resources



*Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.*

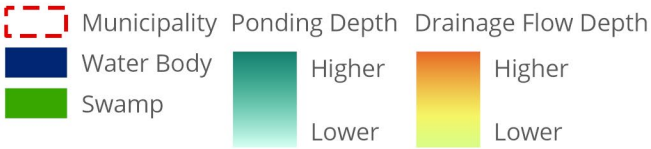
Source: ECRC, FDEP, City of Vernon 7/3/2024

Figure 21. Transportation and Evacuation Routes - 500-Year, 2070 Scenario



City of Vernon - 500-Year, 24-Hour Rainfall Flooding - 2070 Scenario  
Transportation and Evacuation Routes

— Major Roadways

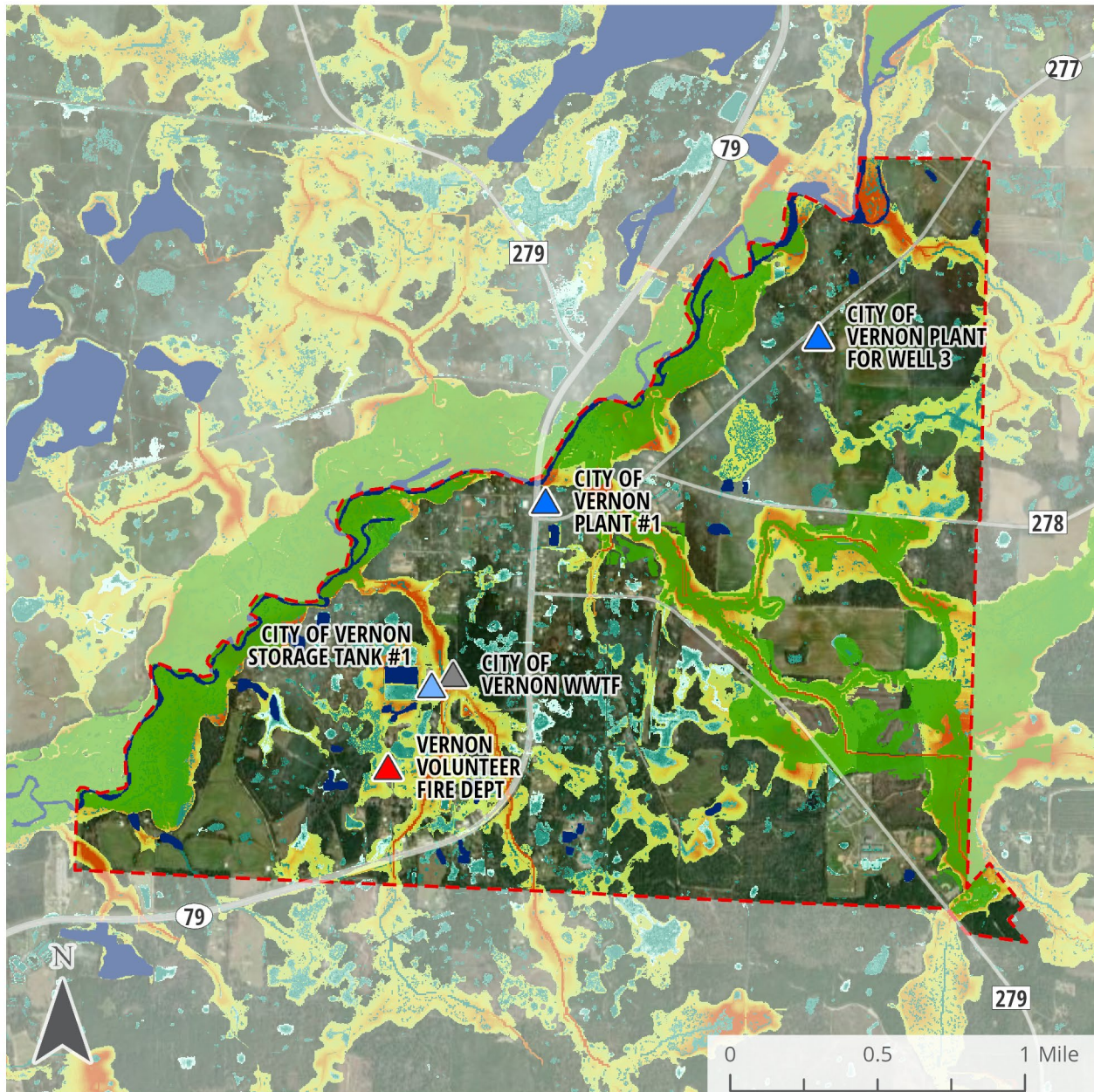


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Source: ECRC, FDEP, City of Vernon

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**Figure 22. Critical Infrastructure - 500-Year, 2070 Scenario**



**City of Vernon - 500-Year, 24-Hour Rainfall Flooding - 2070 Scenario**

**Critical Infrastructure**

- ▲ Wastewater Treatment Facilities & Lift Stations
- ▲ Drinking Water Facilities
- ▲ Water Utility Conveyance Systems
- ▲ Solid and Hazardous Waste Facilities

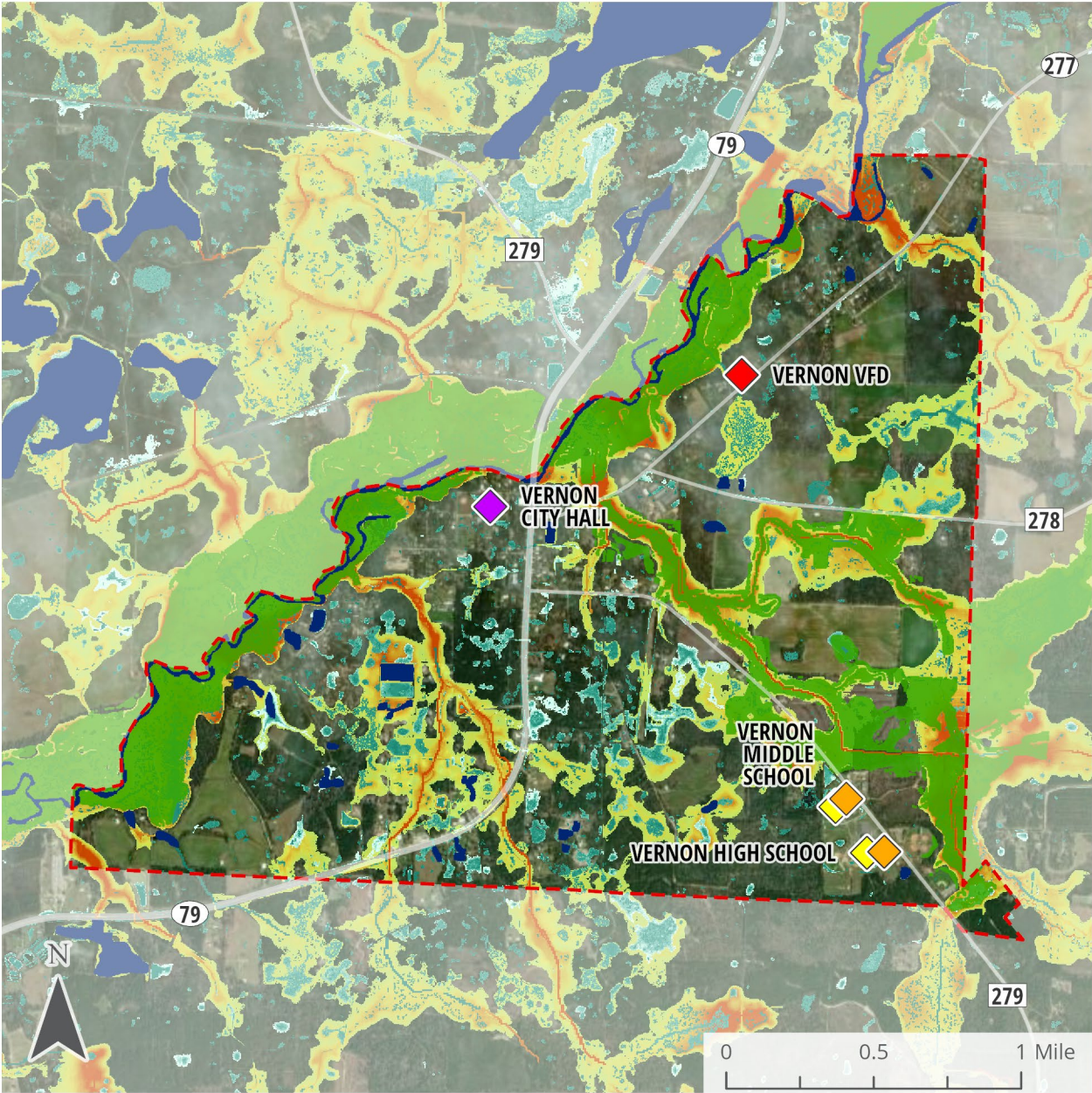
- Municipality
- Water Body
- Swamp
- Ponding Depth: Higher (dark green), Lower (light green)
- Drainage Flow Depth: Higher (dark orange), Lower (light orange)

*Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.*

Source: ECRC, FDEP, City of Vernon

7/3/2024

Figure 23. Critical Community & Emergency Facilities - 500-Year, 2070 Scenario



City of Vernon - 500-Year, 24-Hour Rainfall Flooding - 2070 Scenario

Critical Community & Emergency Facilities

- Schools
- Fire Stations
- Local Government Facilities
- Risk Shelters

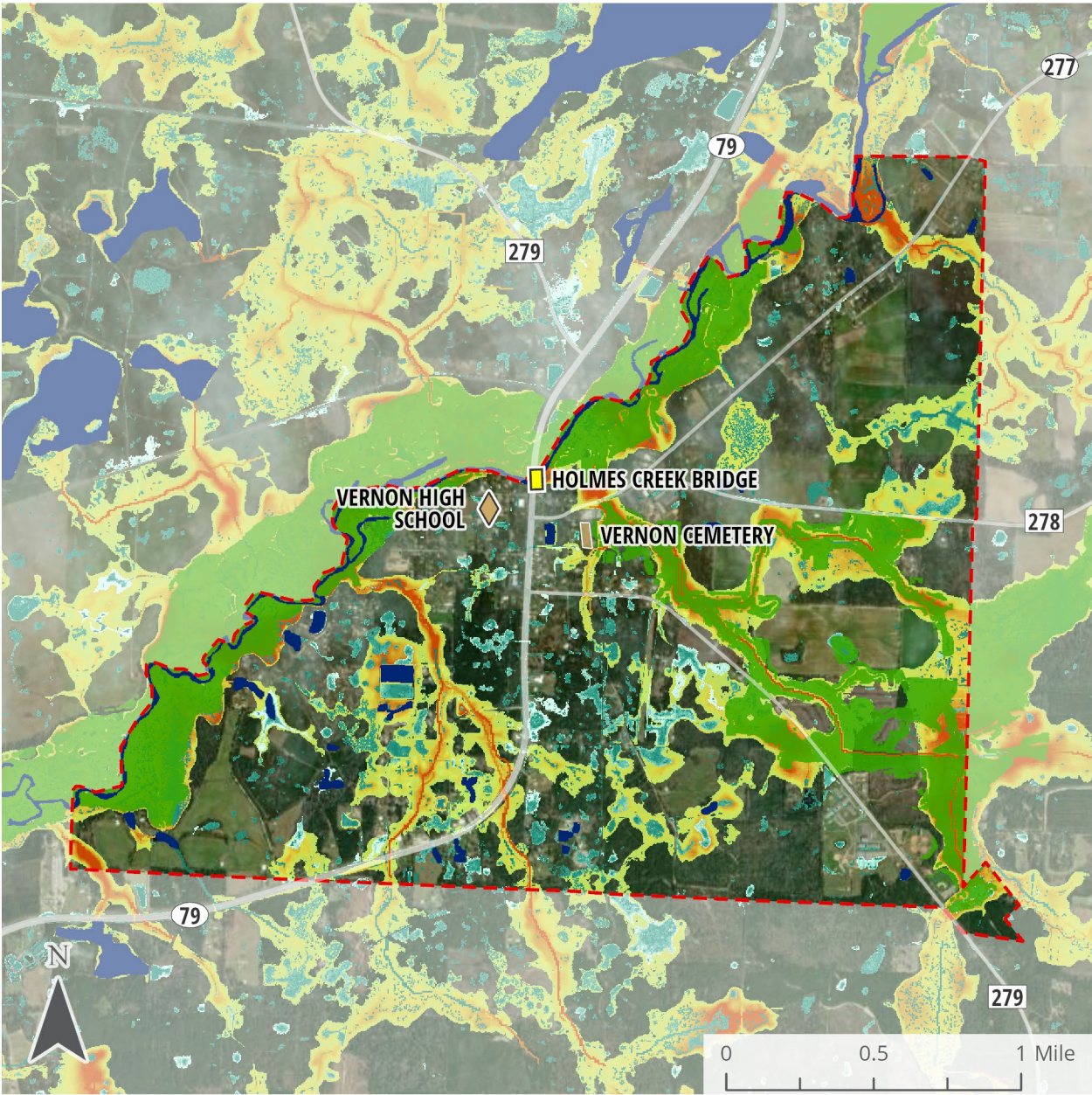
- Municipality
- Water Body
- Swamp
- Ponding Depth: Higher (dark green), Lower (light green)
- Drainage Flow Depth: Higher (dark orange), Lower (light orange)

Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.

Source: ECRC, FDEP, City of Vernon

7/3/2024

Figure 24. Natural, Cultural, and Historical Resources - 500-Year, 2070 Scenario



City of Vernon - 500-Year, 24-Hour Rainfall Flooding - 2070 Scenario  
Natural, Cultural, and Historical Resources

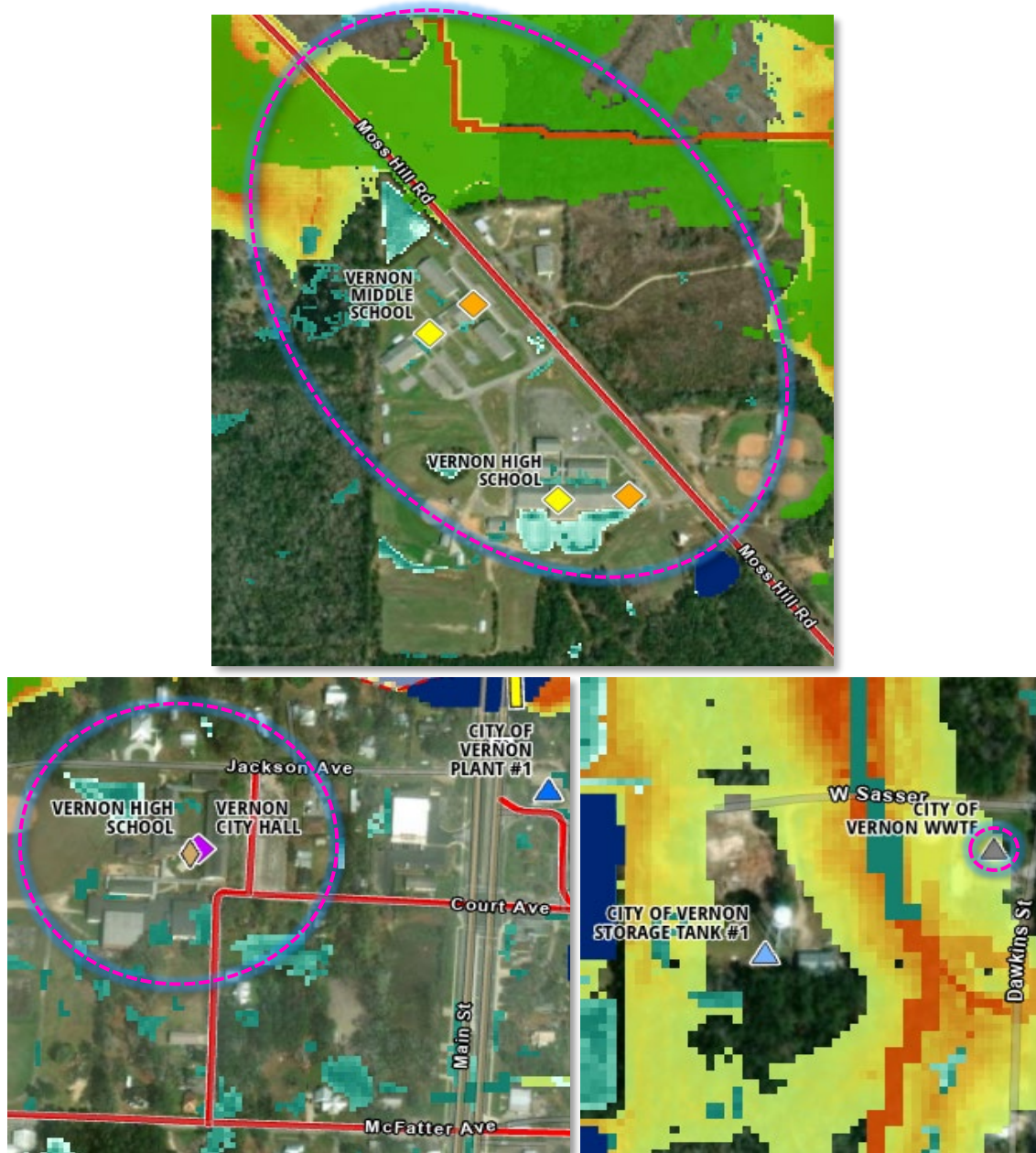


Disclaimer: This figure is not intended to show the exact location of flooding and does not account for all variables affecting future flooding. Actual future flooding may differ from this graphic. This graphic is strictly a planning reference tool and is not for navigation, permitting, insurance rating, or other legal or regulatory purposes.

Source: ECRC, FDEP, City of Vernon 7/3/2024

## V. Focus Areas

For the most part, Critical Assets in the City of Vernon are already located in good locations to avoid any projected future flood events. The exceptions are some ponding on the parcels of Vernon Middle/High Schools and at Vernon City Hall/Old High School. The Vernon Wastewater Treatment Facility also shows the potential for inundation in the 500-year 2070 rainfall scenario.



*Rainfall flooding (circled) at Vernon Middle/High Schools and along Moss Hill Rd (Top), at Vernon City Hall/Old High School (Bottom L), and at Wastewater Treatment Facility (Bottom R) in the 500-year 2070 rainfall scenario.*

Three focus areas have been defined for the City of Vernon. Focus Area 1 contains the City of Vernon Wastewater Treatment Facility. In extreme cases, inundation of wastewater treatment facilities can lead to the spillage of untreated or partially treated sewage into nearby water bodies, posing significant risks to public health and the environment. Even minor flooding can restrict access to the facility during critical periods. Over time, frequent flooding can damage the facility necessitating expensive repairs.

Focus area 2 contains Vernon Middle and High Schools as well as a portion of Moss Hill Road. The inundation of Moss Hill Road would cut off access to the Middle and High Schools during heavy rain events. For the most part, the school building structures appear to be located outside of the affected area as modeled, but ponding could still affect access to the school buildings and damage the school grounds.

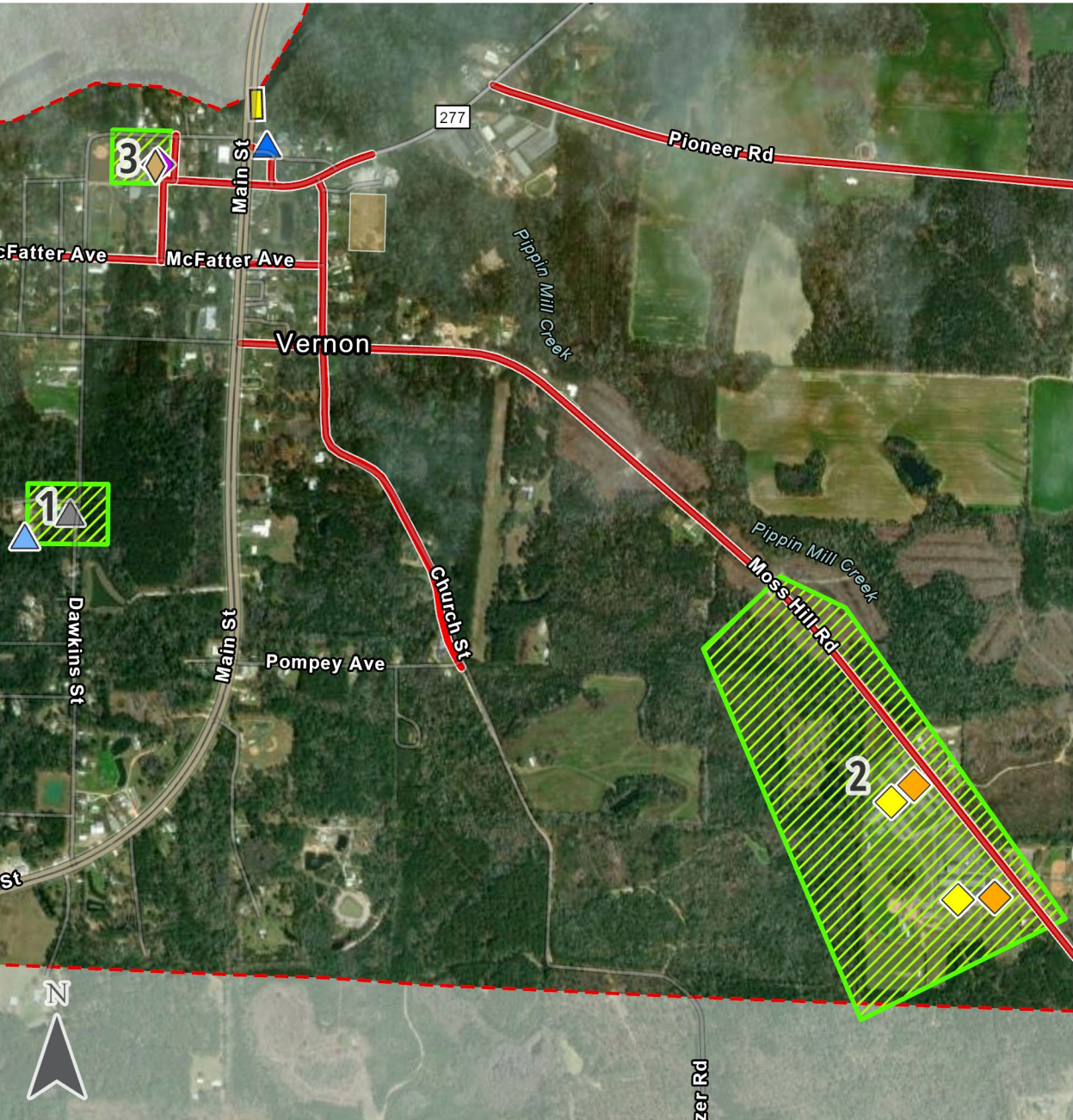
Focus Area 3 contains the Old Vernon High School and current City Hall. As with the schools in Focus Area 2, the structures themselves appear to be safe from inundation, but flooding on the grounds could disrupt access or cause damage to buried infrastructure.

A full list of critical assets located in the City of Vernon's focus areas can be found in Table 13 and a map of all three focus areas is included as Figure 25.

**Table 13. Focus Areas and Critical Assets**

Focus Area	Asset Name	Owner/Operator
1	CITY OF VERNON WWTF	City of Vernon
2	VERNON MIDDLE SCHOOL	City of Vernon
2	VERNON HIGH SCHOOL	City of Vernon
2	MOSS HILL RD	City of Vernon
3	VERNON CITY HALL (OLD HIGH SCHOOL)	City of Vernon

Figure 25. Focus Areas and Critical Assets



City of Vernon - Focus Areas and Critical Assets

8/23/2024

- |                                                 |                                |
|-------------------------------------------------|--------------------------------|
| Focus Area                                      | Local Government Facilities    |
| Municipality                                    | Risk Shelters                  |
| Wastewater Treatment Facilities & Lift Stations | Historical and Cultural Assets |
| Drinking Water Facilities                       | Major Roadways                 |
| Water Utility Conveyance Systems                | Historical and Cultural Assets |
| Schools                                         | Historical and Cultural Assets |

Source: ECRC, FDEP, City of Vernon



## VI. Discussion

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The results of the City of Vernon's Vulnerability Assessment provide building blocks for the next phase of Adaptation Planning. This report highlights specific vulnerabilities to Critical Assets as identified in Florida Statutes. The model indicated the potential for rainfall flooding on the property of Vernon Middle/High Schools, along Moss Hill Rd, at Vernon City Hall/Old High School, and at the Vernon Wastewater Treatment Facility.

This report does not cover all possible future vulnerabilities. Future Vulnerability Assessments may take a wider lens and include privately owned assets alongside the Critical Assets examined here. Additionally, as climate projections evolve and more detailed data becomes available, the City of Vernon may wish to update and expand its vulnerability assessment.

To further strengthen the City of Vernon's approach to water quality and flood mitigation, it is recommended that the city support Washington County in pursuing a Basin Management Action Plan (BMAP) designation. A BMAP provides a legally enforceable framework for water quality restoration, integrating various strategies such as permit limits, infrastructure improvements, and best management practices to achieve pollutant reductions. Given the potential vulnerabilities identified in this assessment, a BMAP designation would allow for a structured, adaptive approach to improving water quality and reducing flood risks. By engaging in this process, the City of Vernon and Washington County can benefit from regional collaboration and access to additional resources and projects that are essential for achieving long-term resilience and environmental health.

City and County staff were instrumental in providing feedback throughout the project. This collaborative effort ensured that the assessment accurately reflects local conditions and Critical Assets. The engagement of additional local stakeholders during the subsequent adaptation planning phase will be essential for ensuring that any future efforts are grounded in the community's needs and experiences.

The recommendations provided in this report serve as a starting point for developing a comprehensive adaptation strategy. Future steps should include detailed assessments for the prioritized areas, exploration of funding opportunities for resilience projects, and continued collaboration with regional partners and experts. The City may also explore analyses focusing on areas which are vulnerable to inundation, but do not contain municipal assets. By taking these steps, the City of Vernon can better prepare for and mitigate the impacts of future flooding events, ensuring the safety and well-being of its residents and the protection of its critical infrastructure.

## References

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