City of Barberton

Multi-Hazard Mitigation Plan

FEMA Approval June 8, 2015
City of Barberton Plan Adoption April 14, 2015

The Magic City
BARBERTON
Founded 1891

Stantec

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Executive Summary

Natural hazards are an unavoidable part of daily life. The City of Barberton is subject to a variety of natural hazards that can impact its citizens' quality of life, and have the capability of destroying property, threatening lives, disrupting businesses and impacting infrastructure. The City has experienced natural hazards, including tornadoes, flooding, severe winter storms, earthquakes, and subsidence due to underground coal mining. There is little that citizens can do to control these events; however citizens and communities can reduce the negative impact of natural hazards through mitigation measures. The Federal Emergency Management Agency (FEMA) defines hazard mitigation as "any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards." The purpose of this plan is to identify the risks associated with the hazards that threaten the City and identify ways to reduce these risks through mitigation activities for current structures and infrastructure and to lessen the impacts on future growth. Mitigation activities can include structural projects, education and outreach efforts, and capital improvement projects, etc. FEMA encourages the use of hazard mitigation to develop a complete document that can be modified and updated as needed.

Legislative Pre-Disaster Mitigation Program

This plan was developed with funding provided by the Legislative Pre-Disaster Mitigation Program (L-PDM) The L-PDM program was authorized by §203 of the Robert T. Stafford Disaster Assistance and Emergency Relief Act (Stafford Act), 42 USC, as amended by §102 of the Disaster Mitigation Act of 2000. Funding for the program is provided through the National Legislative Pre-Disaster Mitigation Fund to assist States and local governments (to include Indian Tribal governments) in implementing cost-effective hazard mitigation activities that complement comprehensive mitigation programs, reduce injuries, loss of life, and damage and destruction of property. L-PDM is a pre-disaster grant program. The L-PDM grant will assist the City of Barberton in mitigating the exposure of its residents to natural disasters through analysis and planning efforts. This plan was also developed with the cooperation of the Ohio Emergency Management Agency (OEMA).

List of Acronyms

CDBG	Community Development Block Grant
EMPG	Emergency Management Performance Grant
EOP	Emergency Operations Plan
ER	Emergency Relief
EWP	Emergency Watershed Protection
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Studies
FMA	Flood Mitigation Assistance Program
GIS	Geographic Information Systems
HAZUS-MH	Hazards U.S. Multi-Hazard
HMGP	Hazard Mitigation Grant Program
ODNR	Ohio Department of Natural Resources
LPDM	Legislative Pre-Disaster Mitigation Program
OEMA	Ohio Emergency Management Agency
MMI	Modified Mercalli Intensity
NCDC	National Climatic Data Center
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
PA	Public Assistance Grant Program
RL	Repetitive Loss
SRL	Severe Repetitive Loss
STAPLEE	Social, Technical, Administrative, Political, Legal, Environmental, and Economic
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
WRDA	Water Resources and Development Act

1.0 Introduction

The City of Barberton is located in Southwestern Summit County, Ohio. The City was founded in 1891 by noted industrialist Ohio Columbus (O.C.) Barber. The city was planned around what is now Lake Anna, which was formed as a glacial kettle lake. The Lake was named after Mr. Barbers' only daughter. The lakes fresh water source is a series of underground springs.

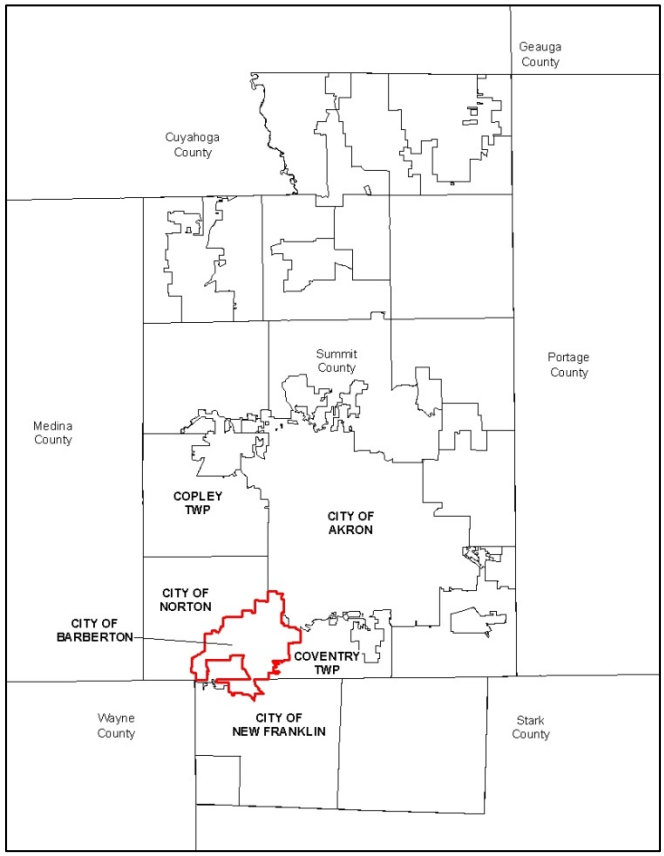


Figure 1. City of Barberton (in red) location map

Barberton has been an innovative community in industry and new technology, from one of the nation's first agracrops and experimental farms facility in the early 1900's to the center of research for Babcock and Wilcox Nuclear and Fossil Fuel Divisions (Source: City of Barberton Website).

According to the United States Census Bureau, the 2010 population was recorded as 26,550. There were a total of 12,191 housing units with 11,054 occupied units. The percentage of owner-occupied housing units was 62.4% vs. renter-occupied housing units of 34.6%. The median household income was reported as $35,985. A U.S. Census 2007 Survey of Business Owners indicated that there were 1,442 companies residing within the City of Barberton.

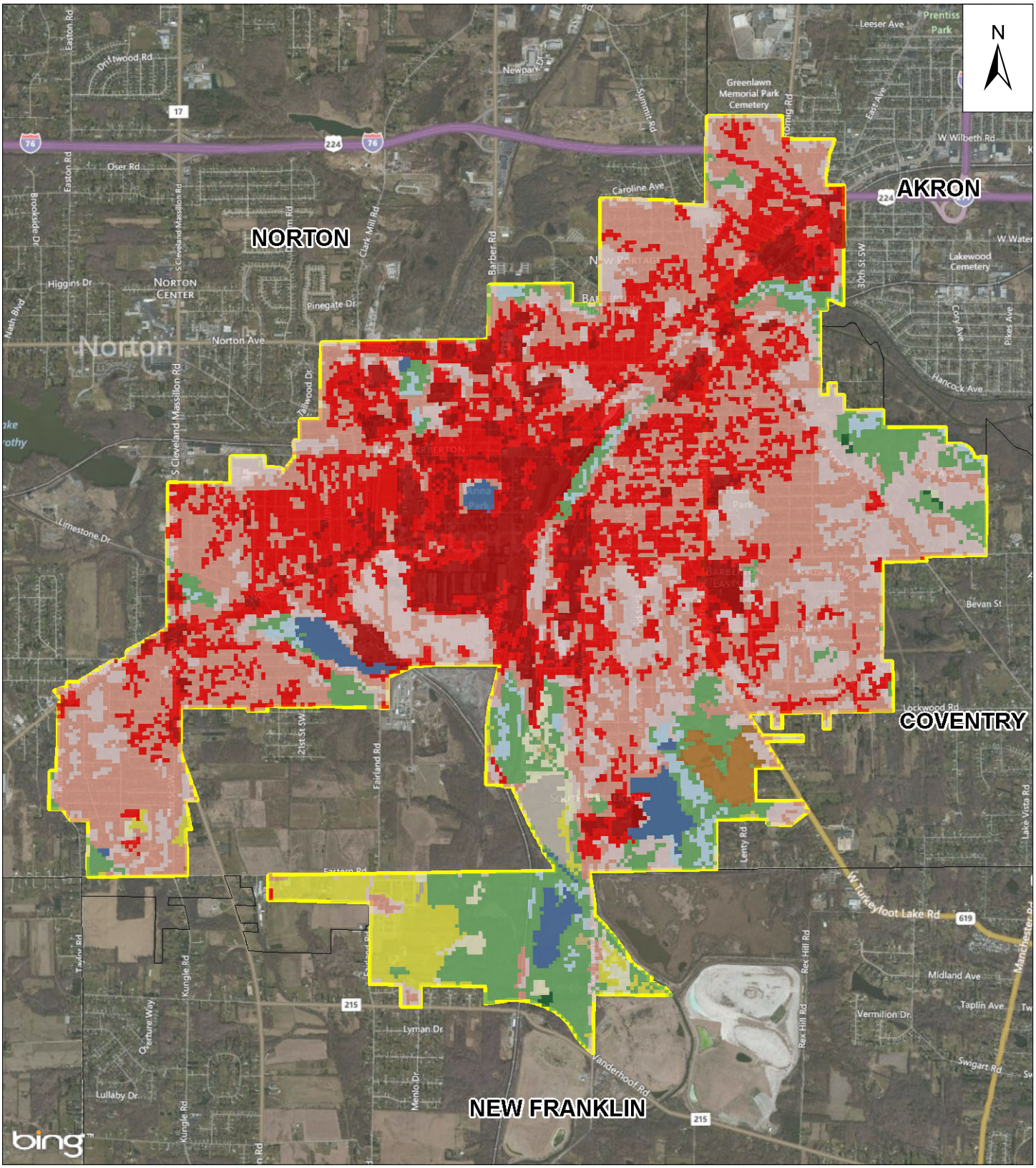
Land use in the city is predominately developed. According to the land cover data, as calculated by the 2006 National Land Cover Data set (NLCD), approximately 81% of the city is classified as developed. Figure 2 shows the land cover of the City of Barberton within Summit County. Table 1 is a summary of the land cover data, provided by the NLCD.

Table 1. Land Cover Data

Cover Type	Percent Cover
Barren Land	<1%
Cultivated Crops	<1%
Deciduous Forest	9.7%
Developed, High	9.9%
Developed, Low	31.4%
Developed, Medium	23.8%
Developed, Open	15.6%
Evergreen Forest	<1%
Grassland/Herbaceous	1.1%
Open Water	2.1%
Pasture/Hay	2.9%
Shrub/Scrub	<1%
Woody Wetlands	1.7%

Source: United States Geological Survey (USGS) 2006 NLCD.

The land area of City of Barberton is approximately 9.3 square miles with roughly 11 miles of mapped streams and rivers. Summit County is situated on the continental divide separating the Muskingum River and the Ohio River watersheds from the St. Lawrence watershed. Land surface in Barberton is dominated by glacial deposits of the Wisconsin Geologic age. Soils in the community range from well-drained sandy and gravelly glacial outwash in the lower areas to moderately well-drained glacial till in the higher areas.



V:\1743\active\174332008\gis\mxd\Barberton_MHMP_Landuse_flooding_dams.mxd
Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
2006 National Land Cover Dataset (NLCD)

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Legend

- Open Water
- Developed, Open Space
- Developed, Low Intensity
- Developed, Medium Intensity
- Developed, High Intensity
- Barren Land (Rock/Sand/Clay)
- Deciduous Forest
- Evergreen Forest
- Shrub/Scrub
- Grassland/Herbaceous
- Pasture/Hay
- Cultivated Crops
- Woody Wetlands

Jurisdictions

- Other Jurisdictions
- City of Barberton

0 820
Feet
1 inch equals 3,500 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment

February 2015

Title

Figure 2. Landuse

1.1 AREA CLIMATE

The climate in northern Ohio is described as mid-continental, moderated by close proximity to Lake Erie. Summer and winter temperatures range from a mean high of 72.4 degree Fahrenheit (°F) in July to a mean low of 27.4 °F in January, with a record high of 104°F recorded in August 1918, and a record low of -20°F recorded in February 1899. Average annual precipitation for the region is 37.3 inches, with average recorded snowfall of 52.5 inches. The precipitation is distributed throughout the year with the maximum received in April (about 4 inches average) and the minimum in October (about 2.5 inches average). The maximum 24-hour rainfall in Barberton was 7 inches recorded in April 1943, and maximum 24-hour snowfall in Summit County was 16 inches, recorded in 1999. Source: FEMA & Summit County Hazard Mitigation Plan (2013)

1.2 ADOPTION BY THE LOCAL GOVERNING BODY

The City of Barberton Multi-Hazard Mitigation Plan, hereafter known as "the Plan" adheres to the guidelines outlined in *44 CFR, Section 201.6*.

The City of Barberton (FEMA Community ID 390524) submitted the Plan to the Ohio Emergency Management Agency (OEMA) and the FEMA Region V for review and comment. After the state reviewers certified that the Plan was approved, City of Barberton then formally adopted the Plan on April 14, 2015. Signed copies of the executed orders are included in **Appendix A** of the Plan.

2.0 Planning Process

2.1 DESCRIPTION OF THE PLANNING PROCESS

This Plan is the first effort by the City of Barberton to comprehensively address various natural hazards which can impact the community and its residents. As an inaugural effort, it establishes important baseline measurements and a decision-making framework the City can develop further with specific projects and plan updates.

The Plan process was based upon FEMA's Single-Jurisdictional Planning document. Specifically, the planning process focused upon soliciting comprehensive feedback from stakeholders and the general public through meetings, questionnaires, and document comment forms.

The planning process was designed to maximize stakeholder involvement and participation to create a viable plan, complete with risk identification and risk mitigation strategies.

2.2 THE PLANNING TEAM

The Planning Team was represented by the following groups:

- Chief Elected Officials. Consisted of the City's senior leadership including the Mayor and City Council. This group authorized and committed the necessary resources and personnel to ensure that stakeholders were properly represented and the Plan met the participation requirements.
- Planning Committee. Consisted of City employees and members of the Flood Action Committee. The Planning Committee was responsible for collecting data, reviewing plans/studies, facilitating public input, developing mitigation goals and, and helping draft the Plan. The Planning Committee is also responsible for coordinating future plan maintenance including yearly reviews and five-year updates.
- Plan Consultant. (Stantec Consulting Services Inc.) Was responsible for facilitating plan development, analysis, mapping, and document preparation support.

Appendix B contains a list of all meeting participants and the organizations they represented.

2.3 PUBLIC INVOLVEMENT

Public participation, for the purpose of the Plan, is defined as an opportunity for the citizens of Barberton to participate in the planning process. Opportunities for public participation were offered through multiple public stakeholder meetings, a publicly available website, and additional future plan maintenance opportunities. In addition, representatives of neighboring counties and jurisdictions were solicited for their input into the planning process and the results of the plan. Documentation announcing the meetings and soliciting input from the public and stakeholders is available in **Appendix B**.

Opportunities for the public to participate were provided in the following ways:

a. Planning Team stakeholder meetings were open to the public;

b. Open public meetings were held to inform the public of the planning process and to request participation;

c. Draft plan text and supporting information were made available via the website for public input and review; and

d. Public opportunities for review of the final plan.

2.3.1 Public Meetings

Three public meetings were held during the development of the Plan, as shown in Table 2. The meetings were publicized through a web link from the City's government homepage.

Table 2 Stakeholder Meetings Scheduled

Date	Purpose of Meeting	Location
1/31/2013	Steering Committee Meeting, Data Collection	Barberton City Hall
11/13/2013	Hazard Assessment and Mitigation Activities	YMCA Meeting Room
2/11/2015	Draft Plan Presentation Meeting	YMCA Meeting Room

The Plan Kickoff Meeting held on January 31, 2013 included a presentation to inform community representatives and the public about the hazard mitigation planning process and the benefits for each jurisdiction. The focus of the meeting was to introduce the planning process, request assistance from the public/private sector and citizens, collect hazard data and critical facilities, and encourage continued participation in the planning and implementation process. During this meeting, Mr. Alan Keltyka (Stormwater & Floodplain Administrator) was identified as the Plan's primary point of contact for public input or questions and the primary contact between the City and the Plan's consultant.

The Risk Assessment Meeting held on November 13, 2013, included a presentation sharing the results of the hazard identification, hazard profiles, and hazard assessments.

The third meeting presented the Draft Multi-Hazard Mitigation Plan held on February 11, 2015, for the hazards identified at the previous meetings. This public meeting allowed the stakeholders and general public to provide feedback on the draft plan. Mike Vinay (Director of Public Service) was chosen as the Plan point of contact from this point forward.

The Planning Consultant and local plan administrators provided guidance throughout both meetings and shared ideas for maximizing stakeholder input. Minutes for each meeting were kept by Stantec and made available to the public, as well as the presentations. They are provided in **Appendix B** of this Plan.

2.3.2 Multi-Media Outreach

The Planning Team used the City website for purposes of promoting planning meetings, providing hazard questionnaires, storing documents, facilitating Plan review and providing general plan information to the public and stakeholders.

The site allowed users to download and access sections of the hazard plan and supporting documents. The result allowed the public to easily obtain and comment on the Plan during both draft stages and prior to Plan adoption. The site was also used to disseminate brochures, past presentations, meeting minutes, other example hazard plans, as well as promote FEMA mitigation project programs and link to the Ohio Emergency Management Agency for additional support.

2.3.3 Public Review of Draft Plan

The draft plan was assembled and provided to the Planning Team for review on January 16, 2015, and then for public review on February 2, 2015. The public and planning team was given three weeks to provide comments. Hardcopy versions of the draft plan were delivered to the jurisdiction's public library, while electronic versions were made accessible from the City website *www.**cityofbarberton**.com/*

2.3.4 Final Plan Access

Following local adoption and FEMA approval of the Plan, the document will be made available to the public at the City of Barberton Storm Water and Floodplain Department and website.

2.4 INCORPORATION OF EXISTING DOCUMENTS

Existing plans, studies, reports, and technical information were collected during the planning process and at meetings. The Planning Team members reviewed and identified common problems, development policies, mitigation strategies, and other policies, plans, programs, and regulations. As part of this effort, the Team contacted numerous agencies seeking local hazard data, existing plans, partnerships, common goals, projects, and commitment to a multi-hazards mitigation plan. This outreach included soliciting information from federal, state, and local resources.

The following are examples of the types of information used to identify natural hazards, vulnerable areas and assets, mitigation actions, and mitigation projects.

- Zoning and Subdivision Ordinances. The ordinances adopted by the City prohibit most development in floodplains and "land subject to inundation" to minimize the danger and financial losses of flooding. The Zoning Ordinance does allow development which would not be overly impacted by flooding, such as parks, golf courses, playgrounds, etc.
- Emergency Operations Plan (EOP). The City of Barberton maintains an Emergency Operations Plan. The plan is a source for hazard identification and emergency operation procedures. Procedures include lists of roles and responsibilities of persons/departments in charge of dispatching support during a natural hazard, rules that are followed, evacuation routes, etc.
- Floodplain Ordinance. This ordinance was adopted in 2011 to prevent damages caused by flooding and to regulate development in the floodplain. The ordinance prohibits development in the floodplain without a permit from the Zoning Administrator. No development in the flood hazard area is permitted to increase the base flood elevation or impact other properties.
- Flood Insurance Rate Maps (FIRMs). Summit County's Flood Insurance Rate Maps were published in 2009. The data was made available by FEMA and the data was used in correlation with geographic information systems (GIS) to estimate structural vulnerability and critical facilities that are located within area floodplains.

- Ohio State Enhanced Hazard Mitigation Plan. The state hazard mitigation plan was useful in providing information for each hazard (i.e. identifying hazards), vulnerability classes, and assessment methods. http://ohiosharpp.ema.state.oh.us/OhioSHARPP/Planning.aspx#ehmp
- National Flood Insurance Program (NFIP). The County and the City of Barberton are enrolled in the NFIP. The NFIP establishes standards for development in the floodplain and provides flood insurance to property owners. The NFIP also maintains a database, which contains information regarding the number and value of flood insurance policies in each jurisdiction, the value of any claims paid, and the number of repetitive loss structures in the communities.

These plans, reports, and studies are incorporated or referenced throughout the Plan. If any plans, report, or studies were not included in the Plan or if new documents are published, they may be added to the Plan during the next update.

3.0 Hazard Risk Assessment

In order to identify and prioritize mitigation actions for the City, the vulnerabilities and risks posed by each hazard to the community's population and infrastructure must be identified and calculated. Risk is defined as the combination of probability of a hazard occurring and the damage caused by the hazard. It is often expressed in terms of damage dollars per year or percent chance of life loss. The goal of the risk analysis is to compare each hazard on an even basis because some hazards may be more likely to occur with less damage (e.g. thunderstorms) and others are relatively rare but can cause catastrophic damage (e.g. tornadoes).

3.1 RISK ASSESSMENT METHODOLOGY

The Planning Team utilized a multi-step process for the hazard risk assessment that utilized the following steps.

- Identify specific hazards of concern
- Identify vulnerable populations, assets and critical infrastructure
- Gather information on historic events and technical studies
- Calculate the probability of occurrence and associated damages
- Prioritize hazards

3.1.1 Hazard Identification

The Planning Team identified the following 8 hazards of concern for inclusion in the plan.

1. Flooding
2. Severe Storms
3. Subsidence
4. Dam / Levee Failure
5. Tornadoes
6. Winter Storms
7. Earthquakes
8. Hazardous Materials

3.1.2 Vulnerable Populations and Critical Infrastructure

At the outset of the project, data was gathered from project stakeholders including the locations of residential and commercial structures, utility and transportation infrastructure and critical facilities. Critical facilities are commonly considered to be police stations, fire and rescue facilities, hospitals, shelters, schools, nursing homes, water supply and waste treatment facilities and other structures the community identifies as essential to the health and welfare of the population and that are especially important following a disaster. These datasets were analyzed in a GIS to compare their proximities to expected hazards.

Table 3 lists the population of the City and Summit County. Table 4 provides a summary of all critical facilities identified during the project. Location of Critical Facilities is in **Appendix I**. Additional information on specific properties and facilities at risk from individual hazards are discussed in the following sections.

Table 3. 2000 – 2010 U.S. Census

FIPS CODE			2000 Census	2010 Census	2000-2010	
CO	PLACE	Municipalities	Total Population	Total Population	Change	% Change
153	N/A	Summit County	542,899	541,781	--1,118	--0.2
153	0524	Barberton, City of	27,899	26,550	-1,349	-4.8

Source: http://www.census.gov/prod/cen2010/doc/dpsf.pdf

Table 4. Critical Facilities Summary

Barberton and Joint Cooperation Facilities	Emergency Operations Center / Warning Sirens	3
	Police Stations	1
	Fire Stations	2
	Education Facilities	8
	Medical Facilities / Health District	2
	Senior Citizen Housing	11
	Community Facilities / Government / Public Works	6
Infrastructure and Utilities	Dams	3
	Electric Substations	5
	Oil/Gas Substations	5
	Water Treatment Plants / Pump Stations	3
	Water Sources – Surface and Supply Towers	5
	Wastewater Treatment Plants / Facilities (Pump Stations)	3
	Total	**57**

3.1.3 Historic Records and Relevant Technical Studies

Data from the National Climatic Data Center (NCDC) was downloaded to review historic hazard information at the County level. The NCDC website presents each hazard and the historic information associated with it for each County, offering several hazard search results including: droughts, dust storm, flooding, fog, hail, hurricanes, lightning, tornadoes, wild/forest fires, ocean/lake surf, precipitation, snow and ice, temperature extremes, thunderstorms and high winds. Of those results, dust storms, severe fog, hurricanes, wild/forest fires, ocean/lake surf and severe precipitation have either never been documented in Summit County, or have not occurred since 1950. This left blizzards, droughts, flooding, hail, lightning, tornadoes, snow and ice, temperature extremes, thunderstorms, high winds, and winter storms to further assess. Note that earthquakes are not part of the NCDC database; the information pertaining to earthquake susceptibility was attained from United States Geological Survey (USGS), the Ohio Department of Natural Resources (ODNR), and the Ohio Emergency Management Agency (OEMA).

In addition to the NCDC data, Stantec reviewed other data sources for a more detailed analysis. These data sources included: local flooding high water marks and precipitation, ODNRs Abandoned Mines Inventory and Locator, 2003 Barberton Subsidence Risk Evaluation Project, 2013 Summit County Natural Hazard Mitigation Plan, and the 2012 Ohio Enhanced Hazard Mitigation Plan.

3.1.4 Hazard Risk Calculations

The next step was to analyze data sources to calculate risk for each hazard and its impact on each community. Two methods were utilized to prioritize hazards. The first, Average

Annualized Loss (AAL) calculations, is a quantitative method. The AAL was computed from known damages and/or structures at risk. These values were gathered from the NCDC, City of Barberton Parcel/Structure Values, and FEMA's All Hazards Loss Estimation Software (HAZUS-MH). The HAZUS-MH program was used for in-depth analyses for Flooding and Earthquake Hazards.

Not all hazards had enough information to calculate direct AALs. For this reason, a second more qualitative method was utilized to compare each hazard through a consistent framework.

3.2 FLOODING

Floods are generally the result of excessive precipitation, and can be classified under two categories: flash floods, the product of heavy localized precipitation in a short time period over a given location; and riverine floods, caused by precipitation over a longer time period. **Appendix F** provides further information/resources on flooding.

3.2.1 Historic Events

NOAA has recorded twenty-seven (27) Flash Flood and eight (8) Flood events documented between 1994 and 2014 in Summit County (see **Appendix C**). Table 5 summarizes the estimated damages caused by flooding.

Table 5. Summary of Flooding Events for Summit County

Hazards	Sum of Property Damage(s)	Sum of Crop Damages(s)	Sum of Deaths	Sum of Injuries
Flash Flooding	179,595,000	75,000	4	0
Flooding	920,000	59,480	0	0
Total	**180,515,000**	**134,480**	**4**	**0**

Summit County has been impacted by four Flood/Flash Flood Disasters over the past 60 years. The City of Barberton has been directly impacted by most of these events. Federal Disaster Declarations (Table 6) were filed for the following flooding events. The Public Assistance figures were directly provided to the City.

Table 6. Summit County / City of Barberton Declared Disasters

DISASTER NUMBER	DISASTER TYPE	DECLARED	PUBLIC ASSISTANCE ($)
DR-167	Heavy Rains, Flooding	3/24/1964	(No data available)
DR-951	Severe Storms, Tornados, Flooding	8/14/1992	50,000
DR-1484	Flooding, Severe Storms High Winds	8/1/2003	City did not apply
DR-1519	Flood, Severe Summer Storm	6/3/2004	34,223
DR-1805	Associated with Tropical Depression Ike	10/24/2008	37,706
		Total	**121,929**

The following flooding events which occurred in Barberton between 2004 & 2013 have been identified by Mr. Alan Keltyka and the Stormwater & Floodplain Department. Pictures from a 1979 flood event can also be found in Appendix C.

- 2004 – May
- 2007 – July 28, August 9, and August 20
- 2008 – February 5, March 4, March 18, and July 26
- 2009 – February 12, March 9, May 27, June 19, July 31, and August 10
- 2010 – March 22, June 23, October 26, November 25, and December 1
- 2011 – February 28, march 10, May 25, June 7, July 19, September 26, October 19, November 19, and December 6
- 2013 – July 10

The following figures (Figures 3 - 8) and descriptions show the extent of some of these flooding events. Figures were taken from a document prepared by the City of Barberton Stormwater / Engineering Department, July 18, 2008 called Westside Flooding Tour.

Figure 3. Slovene Center 14th St. NW – May 2004

Figure 4. Southeast Corner 14th St. NW and Tuscarawas Ave. – May 2004

Figure 5. 44 16TH St. NW – August 20, 2007

Figure 6. 58 19TH St. NW – August 20, 2007

Figure 7. Stormwater Detention Pond – Foundation Baseball Fields, February 2008

Figure 8. Stormwater Detention Pond Outlet to Wolf Creek Foundation Baseball Fields, March 2008

A particularly noteworthy flood occurred in July, 2013. A series of summer storms passed through the Barberton-Norton Area between July 8th and July 10th culminating in a high intensity thunderstorm on the afternoon of the 10th. While the total amount of rainfall for the afternoon storm was less than 3 inches, the intensity of the rainfall during periods of the storm exceeded four inches per hour. Heavy rainfall of this intensity overwhelmed the existing stormwater systems resulting in extensive street flooding throughout Barberton. In many areas of Barberton the flooded streets drained within a few hours but left many flooded basements, garages and yards. A second round of flooding began a few hours after the rains stopped with the local waterways rising from rainfall in surrounding areas making its way downstream to Barberton. These areas began flooding during the night of July 10 and by the morning of July 11th flooding was reaching into new areas. Flood waters in most areas receded by Sunday July 14th leaving behind large areas of the City needing clean-up operations. The City estimates over 700 buildings suffered some form of water intrusion including sewage backups. The following areas of flooding were reported during this storm event:

- 14th, 15th & 16th Streets NW – Wolf Creek: Flooding began during the intense rain on the afternoon of July 10th and the area remained underwater for three days. The flooding closed bridges across Wolf Creek at Wooster Road West, Brady Ave., Norton Ave., and Barber Road in the City of Norton leaving only the Hopocan Ave. bridge crossing Wolf Creek in Barberton accessible. Over sixty businesses and residences reported flooding issues.

- Norton Ave. Barber Road and Miami St. – Wolf Creek: Rising waters of Wolf Creek over the night of July 10-11 flooded the commercial area on Norton Ave. Residents of the Shamrock Motel were evacuated on July 11 and businesses along the north side of Norton Ave. experienced up to two feet of flooding. Over thirty business and residences experienced flooding problems.

- South Barberton – Tuscarawas River: Flooding through the storm sewer system started as the Tuscarawas River levels rose during the night of July 10 – 11 and continued for three days. Over fifty residences reported flooding issues.

- 30th and 31st Streets NW, South Ave. - Hudson Run: Hudson Run experienced a rapid rise in floodwaters during the heavy rainfall in northwest Barberton and Norton. Flood conditions developed rapidly and affected a large Senior Citizen Complex that required evacuation by Barberton Safety Forces on the evening of July 11th along with a number of residences on 31st St. NW and South Ave. Floodwaters overtopped the spillway at the Columbia Lake Dam, about three-quarters of a mile downstream from Wooster Road and closed Hudson Run Road for a short period of time until gates on the dam were opened.

- Coventry Road , Eagon Street Industrial Areas – Mud Run: Six businesses and three residences were affected by the floodwaters of Mud Run.

- 5th St. NE Industrial Area – Tuscarawas River: Three large industries were affected by flooding of parts of their complexes.

3.2.2 Areas of Barberton Flooding

3.2.2.1 14TH, 15TH & 16TH Streets NW

This area of Barberton has been subjected to flooding from Wolf Creek since the City was founded. The first FEMA floodplain maps of the area were published in 1981. The updated flood plain maps of 2009 did not show significant changes to this flood prone area. The majority of the flooding is lower living levels and streets,which appear to have greater potential for assistance then other areas of the city.

Flood Mechanisms:

- Wolf Creek rises due to precipitation within the watershed.
- Rain events in the immediate area from 14th St. NW to 25th St. NW drain into Wolf Creek.
- The Betz Run Drainage that enters Wolf Creek at the BCF Ball fields extends well into Norton and drains a significant area.
- Storm sewers back up and are incapable of draining to Wolf Creek. When additional rainfall in this area and surface runoff from the areas to the west, it accumulates in the streets with nowhere to drain. (Figure 9)

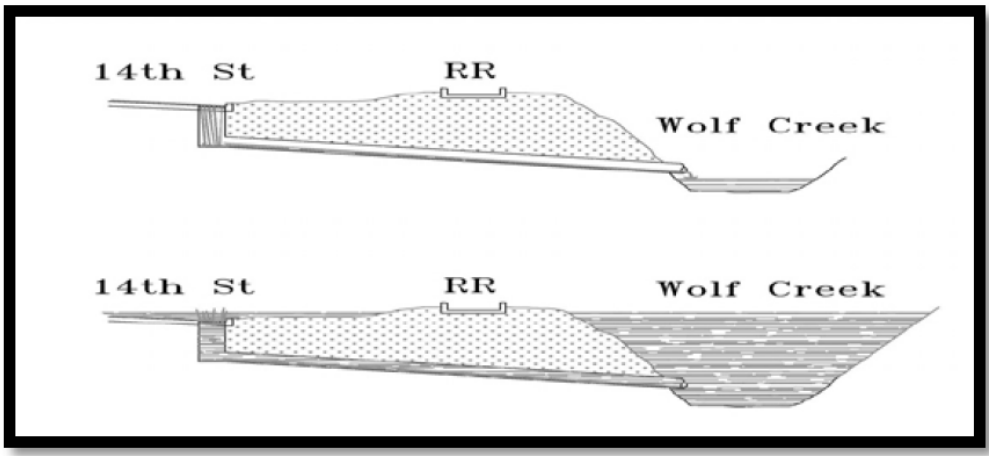


Figure 9. Storm sewer drainage into Wolf Creek during normal vs. elevated creek levels

3.2.2.2 South Barberton Flood Zone

This area of Barberton has been subjected to flooding since the area was first developed. Low-lying areas have been built up by filling in numerous former wetland areas. The first FEMA floodplain maps of the area were published in 1981, and the updated flood plain maps of 2009 have significantly increased the floodplain zone. The majority of the flooding is lower living levels and streets. Sewage backups are also a source of resident complaints.

Flood Mechanisms:

- The Tuscarawas River rises due to precipitation in Barberton and surrounding areas. The drainage area of the Upper Tuscarawas Watershed encompasses southern Summit County and portions of Medina and Stark Counties.
- The three major tributaries in Barberton flowing into the Tuscarawas River are Wolf Creek, Hudson Run and Mud Run.
- Rain events in other parts of the city affect the South Barberton area.
- Storm sewers that back up, as they are unable to drain into the Tuscarawas River.
- Rainfall in the area along with surface water running off from the high ground to the east drains into the South Barberton area.

3.2.2.3 31st Street – Hudson Run Flood Zone

A number of single-family and apartment structures have been subjected to flooding over the years. The FEMA floodplain maps of 1981 did not show these areas within the 100-year flood zone. However, the 2009 updated FEMA flood plain maps have extended the flood zone into these areas.

Flood Mechanisms:

- Hudson Run experiences a rapid rise in floodwaters during heavy rainfall events in the northwest Barberton and Norton areas.
- Flood conditions along Hudson Run are impacted by two dams operated by PPG; the Lake Dorothy Dam lies approximately one-half mile upstream of the Barberton Corporate Line and the Columbia Lake Dam is about three-quarters of a mile downstream from Wooster Road.

3.2.2.4 Mud Run – Coventry Road - Eagon Street Flood Zone

This is primarily a commercial-industrial area with a few older residential structures. Most of the property in the area lies within the FEMA 100 year Flood Zone.

Flood Mechanisms:

- Flooding occurs when high water levels on the Tuscarawas River back up Mud Run. This combined with flow in Mud Run coming down from Akron causes flooding to occur.

3.2.2.5 Robinson Ave. – East Tuscarawas Ave. Flood Zone

This residential area suffered some of the most extensive damage in the 2007 and 2011 flood events. In both of these instances the stormwater retention pond was unable to contain the stormwater runoff and overflowed the levee. The rushing waters filled some residences with over six feet of water and required a boat evacuation of an elderly resident by city safety forces. This pond was constructed in the mid-1970s, primarily for the new east side residential neighborhoods.

Flood Mechanisms:

- During heavy rainfall events in the East Barberton and Coventry Township areas, the stormwater runoff can exceed the present capacity of the retention pond.
- Development of new residential areas is exceeding the system's design capacity. Drainage from this area flows directly into the Tuscarawas River and affects downstream flood zones in Barberton.

3.2.2.6 2nd Street SE – Lamberton Ave. Flood Zone

This residential area of single family homes and three apartment complexes has suffered serious flooding, especially in the 2007 flood events.

Flood Mechanisms:

- During heavy rainfall events on the east side of Barberton, runoff exceeds the capacity of existing drainage systems. Water overflows the local waterway, floods 2nd St. SE and the local structures. While new development in the area is required to construct stormwater storage, the intensity of recent storms exceeds the design capacity. Drainage from this

area flows directly into the Tuscarawas River and adversely affects the South Barberton flood situation.

3.2.2.7 Additional Areas, Not in the Floodplain, Experiencing Problems

17th St. NW - Runoff from Norton flows south on 17th St. NW, flooding yards and approaches foundation walls on structures. The existing storm sewer system is inadequate for the water. While moving the water off 17th St. and the yards is feasible, transmitting this amount of water down a steep slope will create additional problems downstream. As this runoff goes to Wolf Creek, storage is essential to any improvement plan.

Area East of 5th St. NE – A number of neighborhoods are experiencing significant amount of stormwater accumulations in their yards. The depths can exceed two feet and outlying structures are affected. Rapid draining of these areas will increase flow to the major waterways and the construction of additional detention ponds; underground storage chambers and infiltration basins may be needed.

19th And 21st Streets NW– Sections of the streets have low-lying areas that collect runoff in moderate to heavy rain events. The existing storm sewer system has difficulty in handling large amounts of runoff. The runoff water overtops the curbs and flows into residences. The July 19, 2011 flooding resulted in three basement wall failures.

Van- Hyning Neighborhood – Moderate to heavy rain events result in storm water overtopping the curbs and flowing into residences.

Orchard Street And Evergreen Ave. – A natural basin at this intersection overwhelms the existing drainage system and causes flooding.

City Storm Sewer systems in most communities are designed to carry a 10-25 year frequency storm. It is assume that larger storms will be stored or conveyed in the streets. Obviously, much larger storms that exceed both the storm sewer and street capacity will impact adjoining properties.

3.2.3 NFIP (FEMA) and Repetitive Loss

The primary purpose of the NFIP is to provide flood insurance to properties located in floodplains, as delineated by FIRMs. The NFIP maintains records of the frequency and costs of insurance claims for each jurisdiction. Table 7 summarizes the number and value of policies and claims in City of Barberton, as well as number of repetitive loss properties and associated claims.

The most current effective FIRM/FIS for Summit County and the City of Barberton is July 20, 2009. **Figure10** shows the current FEMA floodplains within the city.

Table 7. Summary of NFIP Policies and Claims

Community	Policies		Repetitive Loss Properties		
	Flood Policies	Past Claims No. /Total $	Residential / Non-Residential	Total Losses Residential / Non-Residential	Total Payments Residential / Non-Residential
City of Barberton	110	122 / $1,715,064	27 / 6	64 / 15	$ 409,550.62 / 606,563.69

One of the primary concerns of the NFIP and FEMA are the repetitive loss structures and payments. In general, these structures are located in the floodplain, and account for approximately 30% of insurance policies in City of Barberton, but represents 59% of the total claims value. Thus, minimizing, or ideally eliminating, repetitive loss structures is a primary goal of the NFIP and FEMA. The majority of the repetitive loss structures throughout the City are single family residences.

3.2.4 Risk Assessment and Vulnerability Analysis / Potential Dollars Lost

3.2.4.1 Structure Inventory in City of Barberton

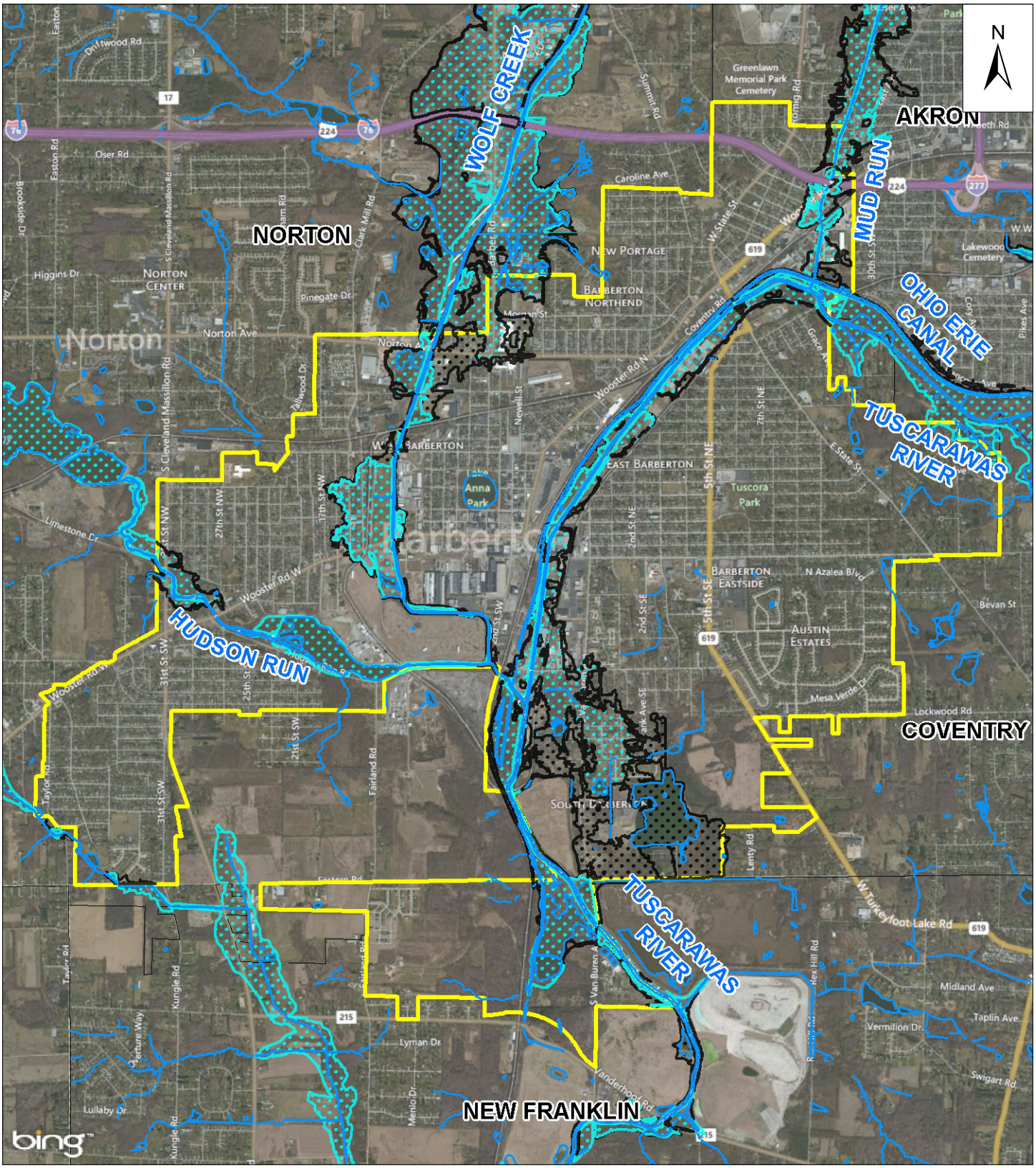
There are approximately 17,500 (building footprints) in the City (Source: Summit County GIS structure inventory), approximately 4.6% of which are located in the FEMA floodplains.

3.2.4.2 Infrastructure and Critical Facilities

There are currently 14 critical facilities within the floodplains, with four (4) of those not associated with infrastructure. Table 8 provides a summary of these critical facilities inside the floodplain.

Table 8. Critical Facilities inside FEMA Floodplains

Barberton and Joint Cooperation Facilities	Tornado Shelters	1
	Education Facilities	2
	Community / Government Facilities	1
	Senior Citizen Housing	1
Infrastructure	Dams	4
Utilities	Electric & Oil/Gas Substations	2
	Wastewater Treatment Plants / Facilities (Pump Stations)	3
	Total	**14**



V:\1743\active\17433008\gis\mxd\Barberton_MHMP_Landuse_flooding_dams.mxd
Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
Federal Emergency Management Agency (FEMA)

Stantec

Legend

- 500-Year
- 100-Year
- Floodway

Jurisdictions

- Other Jurisdictions
- City of Barberton

0 790
Feet
1 inch equals 3,400 feet

City of Barberton Multi-Hazard Mitigation Plan

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Figure 10. FEMA Floodplains

3.2.5 Flood Probability and HAZUS Analysis

Table 9 provides the probability of occurrence for several magnitudes of flooding that the City may experience, in addition to the 1% annual chance flood. The probability of occurrence is expressed as the percent chance that a flood of a specific magnitude will occur in any given year.

Table 9. Flood Probability of Occurrence

Flood Return Interval	Chance of Occurrence in Any Given Year
10 - Year	10 %
25 - Year	5 %
50 - Year	2 %
100 - Year	1 %
500 - Year	0.2 %

To determine potential dollars lost due to flooding events, the program software HAZUS-MH 2.1 was applied to the City. HAZUS was developed by FEMA under contract with the National Institute of Building Sciences. Per FEMA's HAZUS website, "HAZUS-MH is a powerful risk assessment methodology for analyzing potential losses from floods, hurricane winds and earthquakes. In HAZUS-MH, current scientific and engineering knowledge is coupled with the latest geographic information systems (GIS) technology to produce estimates of hazard-related damage before, or after, a disaster occurs." A base Level 1 analysis uses standard modeling and Census data to provide a basic Flood Risk Analysis without any supplied local and/or Flood Insurance (FIS) data.

A Level 2 analysis was performed on a city-wide basis to determine flood risk. HAZUS-MH utilizes national elevation datasets, and US Census data to estimate damages resulting from specified storm events. The program performs hydrologic and hydraulic analyses to identify flood inundation limits for each stream within the City with a watershed of greater than 10 square miles. The base HAZUS-MH run was replaced with flood study information for the Tuscarawas River, Wolf Creek, Hudson Run, and Mud Run from the Summit County FEMA Flood Insurance Study. The FEMA flood profiles can provide a more accurate picture of flood risk, especially for large river systems. This analysis was performed for the 10%, 5%, 2%, 1% and 0.2% annual chance flood events.

The analysis produces an Average Annualized Loss (AAL) estimate based on the results of each flood event and the probability of that event occurring. The AAL is intended to provide an estimate of a community's annual flood risk exposure. The calculated AAL for the City of Barberton is $5.84 Million per year. Table 10 summarizes the results of the HAZUS-MH analysis and an estimate of the number of buildings impacted for the listed flood events. The detailed HAZUS analysis results are included as **Appendix G** of this plan. A graphical depiction of the HAZUS-MH AAL results, at the census block level, is provided in **Appendix G** for the Areas of Flooding concern within Barberton.

Table 10. HAZUS-MH Results Summary

Flood Annual Chance of Occurrence	Buildings Damaged / Destroyed	Total Economic Loss (Millions)
10 %	42	$ 40.3
5%	58	$ 53.3
2 %	97	$ 70.9
1 %	136	$ 86.4
0.2 %	277	$124.6
AAL	N/A	$ 5.8

Table 11 displays the potential structure exposure within the Barberton Area found in the HAZUS results in Appendix G.

Table 11. Potential Structure Exposure (Vulnerability Analysis for SHARPP)

Building Type	Number of Buildings	Exposure ($)
Residential	2,203	453,726,000
Non-Residential	2,190	451,017,000
Critical Facilities	106	21,795,000
Total	4,498	926,538,000

3.2.6 Future Development Risks

The City has developed a Flood Action Committee starting in 2012 to assist with the production of the Multi-Hazard Mitigation Plan. This committee meets quarterly to discuss known flooding issues, identify mitigation actions, and assist with the Plan.

The risks associated with flooding are directly related to the population and infrastructure located within the boundaries of the riverine floodplains. Development should be limited in these potential impact areas. Infrastructure improvements should also consider potential impacts. Existing floodplain and construction regulations are in place to help reduce the impacts from flooding.

Stormwater infrastructure should also be looked at to determine the impact from flash flooding. This infrastructure does not always take into effect the growth of a community. An increase in impervious surfaces (e.g., concrete parking lots) may cause increased storm water runoff during a rain event.

3.2.7 Flood Mitigation Strategies and Goals

The City of Barberton developed a Flood Risk & Vulnerability Assessment document (2013), prepared by the Barberton Fire Department and Stormwater & Floodplain Department. The City has prepared the following recommendations to improve its flood preparedness and recovery efforts. Figures 11-14 below were taken from a presentation given at the February 2012 Flood Action Committee meeting.

- Improve data collection pertaining to flood loss and quantify losses.
- Develop an official Flood Risk and Vulnerability Assessment for the City of Barberton.
- Continually review and update emergency response and flood mitigation SOP's
- Review and update policies, procedures, and local ordinances.

A listing of identified Mitigation Actions as part of this planning process can be found in **Appendix D.** The following goals can be achieved through the identified Mitigation Actions.

- Reduce risks through regulations including building and zoning codes, development outside of hazardous areas, and local planning or capital improvement projects.
- Reduce exposure to hazards through building or parcel-specific activities such as flood proofing, structure acquisition, or retrofitting.
- Reduce impacts through response and recovery activities that are implemented during a disaster.
- Minimize impacts through projects, such as detention basins, acquisition & demolition, elevation and other projects.
- Assist residents to prepare for risks and protective measures to better protect themselves and their property.

Figure 11. Wolf Creek Stormwater Mitigation Strategies

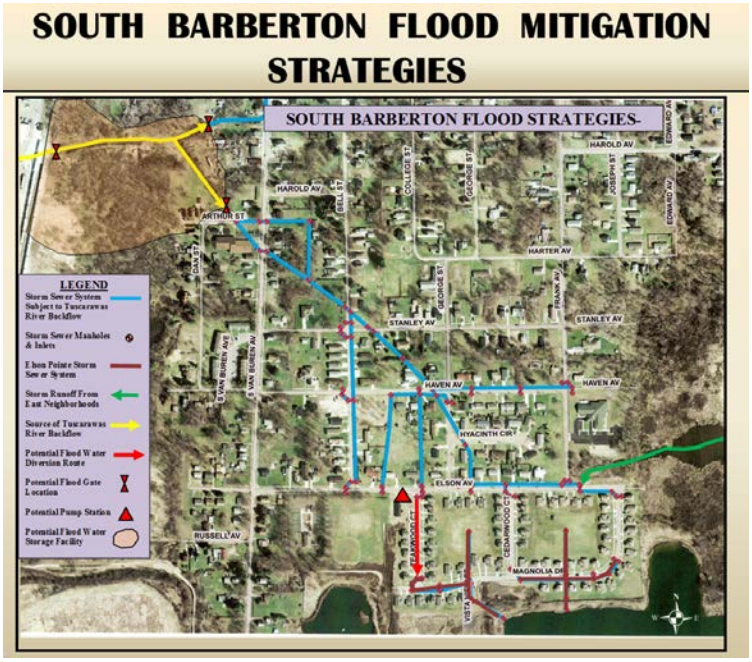


Figure 12. South Barberton Flood Mitigation Strategies

Figure 13. Hudson Run Flood Mitigation Strategies

Figure 14. Robinson Ave. – E Tuscarawas Ave. Stormwater Mitigation Strategies

3.3 SEVERE STORMS

Severe storm hazards include severe thunderstorms, high wind, hail and lightning. While tornadoes and flooding may be related to these events, they have been broken out as separate categories for this plan. Severe Storms are jurisdiction-wide and can affect all areas of the City. **Appendix F** provides further information/resources on severe storms.

3.3.1 Historic Events

Federal Disaster Declarations were filed for the following severe storm events with impacts to Summit County. The descriptions of events were gathered from NOAA and FEMA.

- Federal Disaster Number DR-951, July 12, 1992 to August 1, 1992.
- Federal Disaster Number DR-1444, November 10, 2002. Severe storms and tornadoes caused flooding and high wind damages in Ohio. Multiple residents and businesses received Individual Assistance through FEMA. Dozens of cars were damaged or destroyed and hundreds of trees and power poles downed in Summit County.
- Federal Disaster Number DR-1484, July 21, 2003 to August 25, 2003. Severe storms and tornadoes caused flooding and high wind damages in Ohio. Multiple counties received Public Assistance through FEMA. The first month after the disaster, 11 counties including Summit were approved for $20.5 million in Public Assistance. Thunderstorm winds, downed many large tree limbs in southern Summit County.
- Federal Disaster Number DR-1519, May 18, 2004 to June 21, 2004. Severe storms caused flooding and high wind damages in Ohio. Multiple counties received Public Assistance through FEMA. The first month after the disaster, A line of severe thunderstorms moved across Summit County and downed hundreds of trees and caused widespread power outages.
- Federal Emergency Number EM-3250, August 29 - October 1, 2005. All 88 counties in Ohio were included in the federal declaration from remnants of Hurricane Katrina. Costs were incurred due to evacuation of other states.
- Federal Disaster Number DR-1805, September 14, 2008. Summit County received $1,015,863 in Public Assistance funds from severe storms associated with tropical depression Ike. The City of Barberton acquired $37,706 of those funds.
- Federal Disaster Number DR-4077, June 29 - July 2, 2012. The “derecho” wind storms of late June and early July were the third-most expensive natural disaster in Ohio in 38 years. Only the tornado outbreak in Xenia in 1974 and the hurricane-borne winds of 2008 created costlier damage, according to an insurance trade association at that time. All communities/counties were eligible for hazard mitigation grants.

The complete list of historic severe storm events documented by NOAA since 1965 can be found in **Appendix C**. Table 12 below provides a summary of these events. Only events specific to Summit County were used in the analysis. Region-wide / State-Wide were not considered due to inflated impacts.

Table 12. Summary Table of Severe Storm Events

Hazards	Sum of Property Damage(s)	Sum of Crop Damages(s)	Sum of Deaths	Sum of Injuries
Hail	114,301,000	10,000	0	1
High Winds	4,749,000	30,000	0	1
Lightning	295,000	0	1	10
Total	**119,350,000**	**40,000**	**1**	**12**

3.3.2 Risk Assessment and Vulnerability Analysis / Potential Dollars Lost

Because the location and impacts associated with severe storms are random in nature, the Planning Team utilized historic events to determine Barberton's susceptibility to severe storms. NOAA has recorded 245 severe storms in Summit County since 1955, with total losses of approximately $119 Million (please see **Appendix C**). Based on these results, Summit County averages approximately four (4) to five (5) severe storm events per year with average annual damages of approximately $2 Million. Approximately 5% of the buildings reside within the Barberton area, which means the average annual damages for the City could be approximately $100 Thousand.

Table 13 displays the potential structure loss within City of Barberton, jurisdiction-wide. Due to the unpredictable nature of Severe Storm events, all structures are at risk. (Source: Summit County Building Footprints)

Table 13. Potential Structure Loss (Vulnerability Analysis for SHARPP)

Building Type	*Number of Buildings	*Exposure ($)
Residential	3,906	128,625,175
Non-Residential	548	59,955,023
Critical Facilities	0	0
Total	4,454	188,580,198
*Realistic 25% of structures/value		

Critical facilities can be impacted most directly by severe storms through power outages. The critical facilities with power concerns (e.g. hospitals, nursing homes, etc.) can be greatly impacted by severe storms and precautions must be taken for the provision of backup power. In terms of potential impacts on infrastructure and utilities, roads may be flooded by heavy rains associated with severe storms. Utility outages can be attributed to heavy winds. Continuous operation of services such as Sanitary Sewer, Drinking Water, Electricity, and Natural Gas are very important during a Severe Storm.

3.3.3 Future Development Risks and Mitigation Strategy

Due to the non-site-specific nature of this hazard, future development trends will have no significant effects on the occurrence of severe storms. However, population growth and increased infrastructure and building stock will likely increase annual expected damages.

New construction should seek to minimize wind-load impacts for buildings and provide basement areas or other secure locations to serve as storm shelters. Additionally, utility areas could be maintained to reduce the number of power outages from fallen trees and/or branches due to strong winds.

A listing of identified Mitigation Actions as part of this planning process can be found in **Appendix D.** The following goals can be achieved through the identified Mitigation Actions.

- Reduce risks through early emergency notification systems.
- Reduce impacts through response and recovery activities that are implemented during a disaster.
- Reduce impacts to critical facilities during/after an emergency by assessing vulnerability for each facility.
- Reduce impacts by providing adequate Storm Shelters during/after an emergency.
- Assist residents to prepare for risks and protective measures to better protect themselves and their property.

3.4 SUBSIDENCE

Sinkholes due to Mine Subsidence can strike with little or no warning and can result in very costly damage. Mine Subsidence usually only affects a smaller area, but still can affect many lives and industries. The largest impact is to major roads where underground mining has occurred in the past. **Appendix F** provides further information and resources on subsidence.

Figure 15 depicts a general layout of an underground mine.

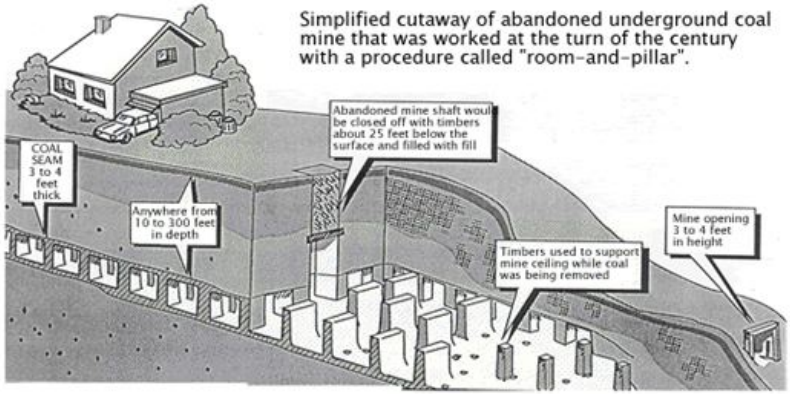


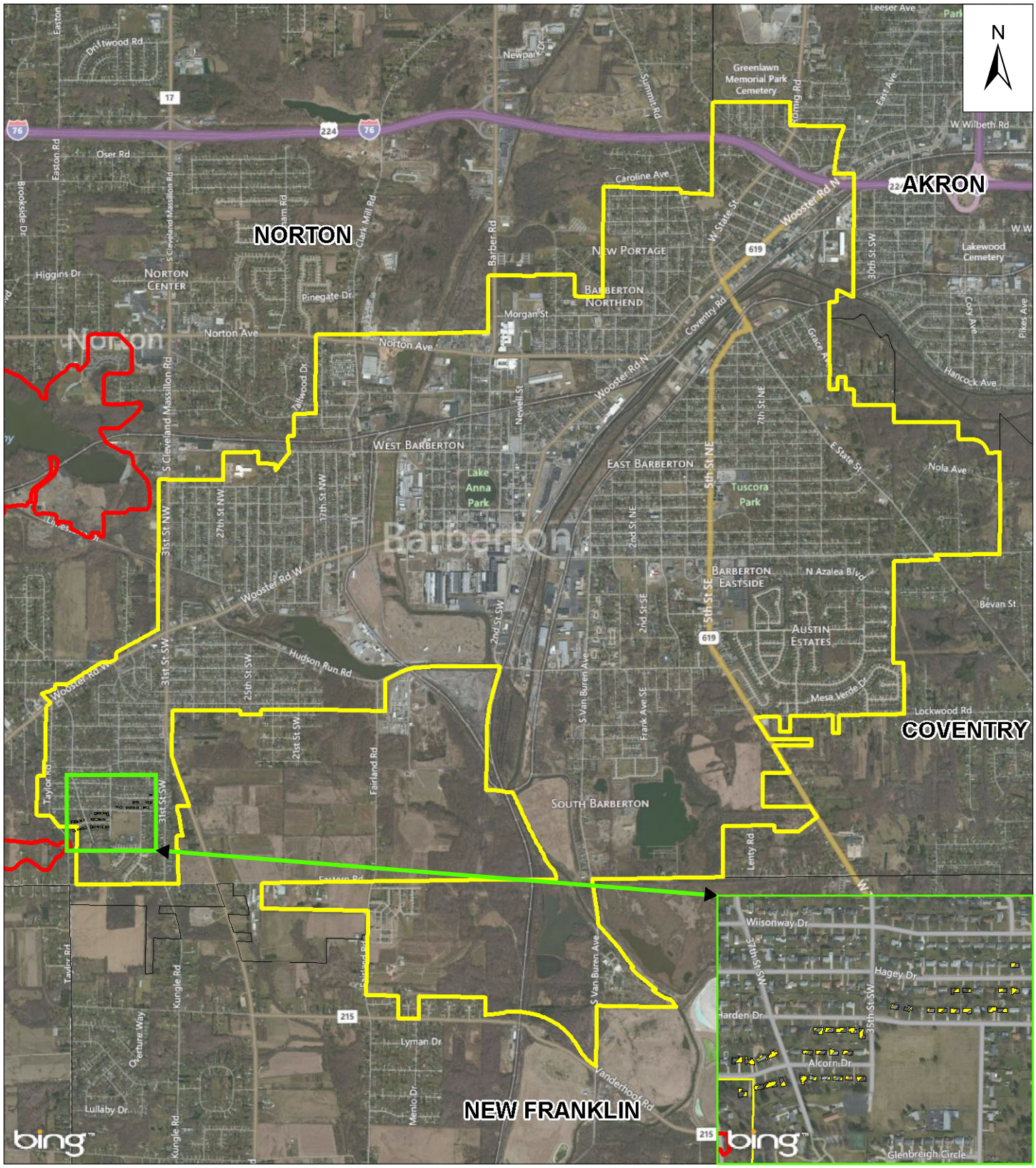
Figure 15. Underground Mine Layout Example

3.4.1 Historic Events

One area within the southwest quadrant of Barberton has been experiencing subsidence events for a period of over thirty years. The community between the streets of Taylor Road on the west, Harden Drive and Alcorn Drive on the south, 31st Street along the east, and Hagey Drive on the North. ODNR contracted Baker and Associates to perform a Barberton Subsidence Risk Evaluation Project for this area, which was completed in 2003. This report consolidated two reports, one from 1982 and the other from 2001. The main purpose of these reports was to define the subsurface profile within proximity of known subsidence areas and to determine the extent of the unmapped mine works and its potential for future subsidence areas.

The consolidated report concluded that there were 69 parcels (including a school) that lay above an underground mine that had closed in the late 1800s. The purpose of this project was to conduct a risk assessment and rank each potentially undermined structure based on its risk of subsidence damage. As of 2006, there have been 8 potential subsidence events reported within or near Barberton.

Two different stabilization methods were suggested (Source: 2003 Barberton Subsidence Risk Evaluation Report, ODNR): 1) “In standing voids where lateral confinement is not available for grouting, premixed concrete pillar or staged grouted aggregate columns can be used.” 2.), and “In collapse and fractured areas, pressure grouting may be used with care not to exceed predetermined pressures with depth to prevent uplift and collateral damage to structures. **Figure 16** shows the general location of abandoned underground mines and other subsidence concerns.



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
Ohio Department of Natural Resources (ODNR)

Stantec

Legend

- Bldgs Assessed by ODNR
- Underground Mine

Jurisdictions

- Other Jurisdictions
- City of Barberton

0 790
Feet
1 inch equals 3,400 feet

City of Barberton Multi-Hazard Mitigation Plan

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Figure 16. Subsidence Concerns

3.4.2 Risk Assessment and Vulnerability Analysis / Potential Dollars Lost

Because of the variables that contribute to mine related subsidence, no acceptable system exists that is capable of accurately predicting the time or amount of subsidence in a variety of geological settings, especially for mines that have an irregular pattern of room-and-pillar mining. In addition to subsidence above a mine, collapse of improperly stabilized mine openings presents great risk to public property and safety.

Table 14 displays the potential structure loss within Barberton within the area studied by ODNR. Residential structures are only located near the impacted study area.

Table 14. Potential Structure Loss (Source: Summit Parcels / Structure Inventory)

Structure Type	Number	Loss Estimate ($)*
Southwest Area		
Residential	36	3,688,810
Non-Residential	0	0
Critical Facilities	0	0
* Total Appraised Value		

3.4.3 Future Development Risks and Mitigation Strategy

The risks associated with subsidence are directly related to the population and infrastructure located within proximity to underground mines. Development should be limited in these potential impact areas. Infrastructure improvements should consider potential impacts.

A listing of identified Mitigation Actions as part of this planning process can be found in **Appendix D.** The following are examples of mitigation projects designed to reduce the risk from mine subsidence.

- Map and assess vulnerability to subsidence. Use GIS to map and identify areas more susceptible to subsidence. Using Ground-Penetrating Radar to detect underground mining.
- Develop regulations to help manage development in high-risk areas.
- Consider subsidence concerns in future building design.
- Monitor subsidence risk factors where open mines or removal of natural resources exist.
- Remove existing structure from high-risk areas.
- Increase residents' knowledge / awareness of subsidence risks.

3.5 DAM / LEVEE FAILURE

A dam/levee failure can result in the uncontrolled release of floodwaters downstream of a facility. The resulting flood wave can cause significant damage to buildings and infrastructure downstream. The unexpected nature of the flood wave also increases the likelihood of life loss in the impacted area due to reduced warning times. **Appendix F** provides further information/resources on Dam/Levee Failure.

3.5.1 Historic Events

According to the Stanford University, National Performance of Dams Program, Lake Dorothy Dam had a "Gate Operation" Incident in 1995. However, that incident did not result in any failure. The City of Barberton has no reported incidents of Dam/Levee failures.

3.5.2 Risk Assessment and Vulnerability Analysis / Potential Dollars Lost

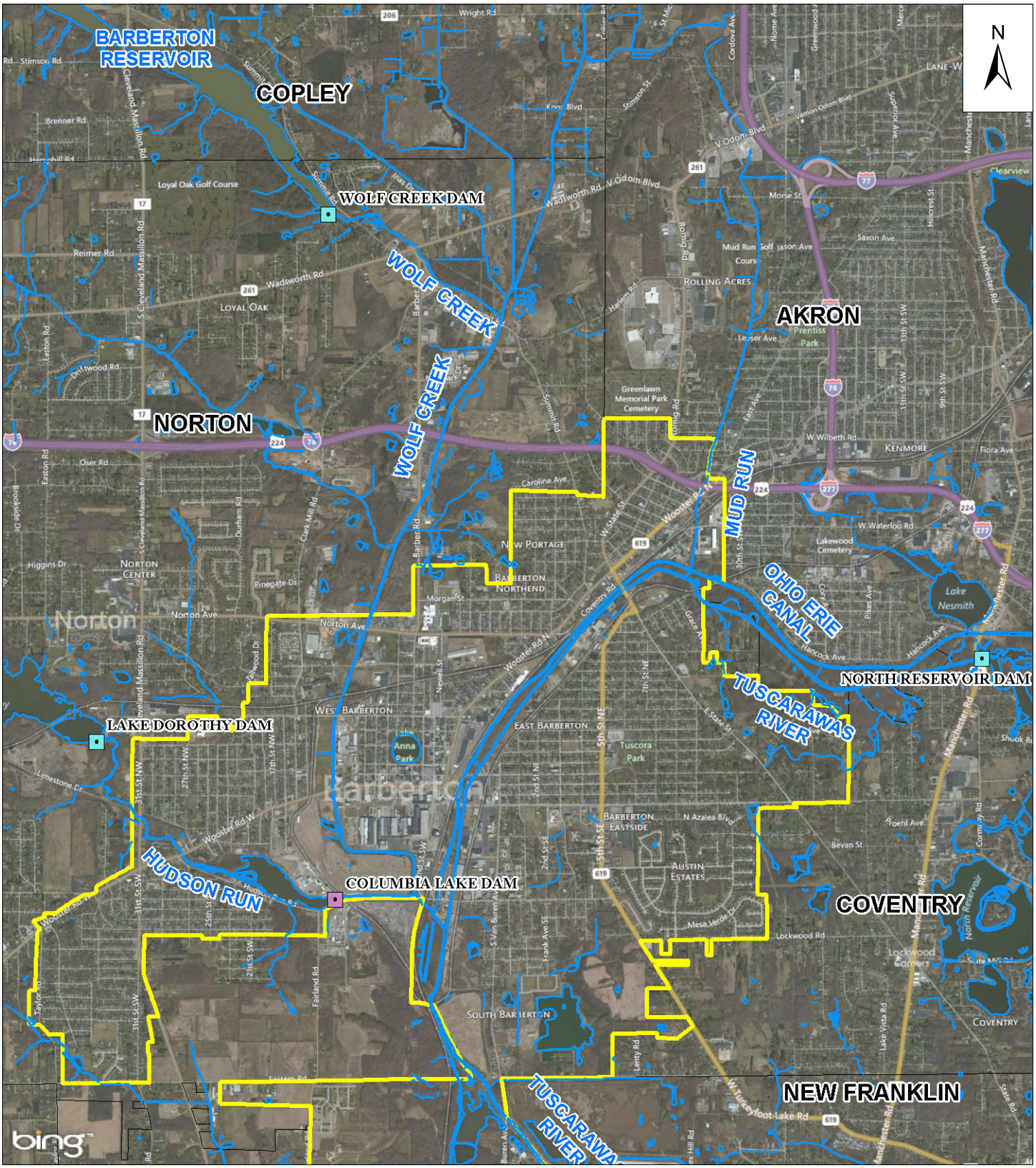
The city has identified four (4) known dams: Lake Dorothy Dam, Wolf Creek Dam, North Reservoir Dam, and Columbia Lake Dam. **Figure 17** shows the location of these dams. At the time of Plan development, only one of the dams (Lake Dorothy) had an available Emergency Action Plan including breach analysis for review and incorporation.

The Lake Dorothy, Wolf Creek and North Reservoir Dams are all considered Class I structures as defined by the Ohio Department of Natural Resources; meaning a failure of the facility has a high probability for causing loss of life or substantial economic loss. Impacts from a dam failure could impact multiple structures, bridges, and infrastructure downstream of the dam.

Lake Dorothy Dam is an industrial dam created by PPG Industries within the Township of Norton. The dam lies just outside of the City of Barberton and contains a reservoir on Hudson Run. PPG Industries had a Dam Breach Analysis Study performed on the dam to determine the impact from a dam breach at different water levels. Table 15 provides the potential structure loss within Barberton within the inundation zone for Lake Dorothy.

Table 15. Potential Structure Loss (Source: Summit Parcels / Structure Inventory)

Structure Type	Number	Loss Estimate ($)
Lake Dorothy Dam		
Residential	266	7,578,090
Non-Residential	44	3,003,690
Critical Facilities	3	808,940
Total	310	11,390,720



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
Ohio Department of Natural Resources (ODNR)

Stantec

Legend

Summit Dams
CLASS
- I
- II
- III
- IV
- Unclassified

Summit County Drainage Jurisdictions
- Other Jurisdictions
- City of Barberton

0 930
Feet
1 inch equals 4,000 feet

City of Barberton Multi-Hazard Mitigation Plan

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Figure 17. Dams of Concern

Wolf Creek Dam (Class 1) is located within Norton Township. The reservoir supported by this dam supplies Barberton with its main drinking water source. The water treatment plant near the base of the dam was identified as a Critical Facility. Along with the potential loss of the water source, there is also a potential of pollution and contamination. The Emergency Action Plan (EAP) should identify and mitigate potential contamination.

North Reservoir Dam (Class 1) is part of the Portage Lake System within Summit County. This dam controls the flow of the Tuscarawas River and Ohio Erie Canal. The Portage Lakes, a series of lakes south of Akron, were created as part of this network of water supply reservoirs. They were formed by the construction of dikes and dams to raise the water levels of some of the swamps and small lakes typical of this heavily glaciated southern part of Summit County. During heavy rainfall, ODNR releases water out of the North Reservoir Dam, which causes increased flow into Barberton. The North Reservoir Dam is now used for Recreation.

Columbia Lake Dam is another PPG Industries Dam, with its primary purpose as a water supply. The reservoir is located in the City of Barberton along Hudson Run. This dam is Class II structure as defined by the Ohio Department of Natural Resources.

Classification criteria for dams are found in the Administrative Rules Chapter 13-1501:21-13-01.

(1) A dam shall be placed in Class I when failure of the dam would result in probable loss of human life. Dams having a total storage volume greater than five thousand acre-feet or a height of greater than sixty feet shall be placed in class I.

(2) Dams having a total storage volume greater than five hundred acre-feet or a height of greater than forty feet shall be placed in Class II. A dam shall be placed in Class II when failure of the dam would result in at least one of the following conditions, but loss of human life is not envisioned.

(3) Dams having a height of greater than twenty-five feet, or a total storage volume of greater than fifty acre-feet, shall be placed in Class III. A dam shall be placed in Class III when failure of the dam would result in at least one of the following conditions, but loss of human life or hazard to health is not envisioned.

(4) When failure of the dam would result in property losses restricted mainly to the dam and rural lands, and no loss of human life or hazard to health is envisioned, the dam may be placed in Class IV. Dams which are twenty-five feet or less in height and have a total storage volume of fifty acre-feet or less may be placed in Class IV.

3.5.3 Future Development Risks and Mitigation Strategy

The risks associated with dam failure are directly related to the population and infrastructure located in the downstream breach path. Development should be limited in these potential impact areas. Infrastructure improvements should consider potential impacts.

A listing of identified Mitigation Actions as part of this planning process can be found in **Appendix D.** The following goals can be achieved through the identified Mitigation Actions.

- Reduce risks through early emergency notification systems.
- Develop a comprehensive study of all dams that could impact the Barberton Area.

3.6 TORNADOES

Tornadoes are produced from the energy released during a thunderstorm, but account for only a tiny fraction of the overall energy generated by a thunderstorm. What makes tornadoes particularly dangerous is that the energy is concentrated in a small area, perhaps only a hundred yards in diameter. **Appendix F** provides further information/resources on tornadoes.

3.6.1 Historic Events

Tornadoes are relatively common in the northeast portion of the State of Ohio. **Figure 18** shows the locations of tornadoes that have impacted Summit County over the past 50 years. There have been no reported tornadoes resulting in damages within the City of Barberton. Table 16 provides a summary of tornado events listed within the NCDC database. A complete list of reported NOAA tornado events is located in **Appendix C**.

Table 16. Summary Table of Tornado Events

Category	# of Events	Deaths	Injuries	Damages ($)	Average Death/Event	Average Injury/Event	Average $/Event
EF0	8	0	0	277,000	0.00	0.00	15,400
EF1	4	0	0	4,002,500	0.00	0.00	1,000,625
EF2	2	0	0	12,700,000	0.00	0.00	6,350,000
EF3	2	0	1	2,525,000	0.00	0.50	1,262,500
EF4	0	0	0	0	0.00	0.00	0
Total	16	0	1	19,504,500			8,628,525

Federal Disaster Declarations were filed for the following tornadoes with impacts to Summit County. The descriptions of events were gathered from NOAA and FEMA.

- Federal Disaster Number DR-421, April 4, 1974. Tornadoes and high winds caused severe damage throughout northeastern Ohio. Multiple counties received Public Assistance through FEMA.
- Federal Disaster Number DR-951, July 12, 1992 to August 1, 1992. Severe storms and tornadoes caused high wind damages in Ohio. Multiple residents and businesses received Individual Assistance through FEMA.
- Federal Disaster Number DR-1444, November 10, 2002. Severe storms and tornadoes caused flooding and high wind damages in Ohio. Multiple residents and businesses received Individual Assistance through FEMA.

According to the National Climatic Data Center, there have been no tornadoes inside the Barberton city limits within record. However, there have been events in the vicinity of the city.

Vicinity of Akron
F-2, April 19, 1963 3:20 pm
Fatalities: 0 Injuries: 0

In the Akron-Canton area, several small, poorly-developed tornadoes were in evidence, several buildings in a shopping center were heavily damaged, and a brick wall on a factory building was blown down. These were part of a squall line thunderstorms which completely removed or heavily damaged several hundred roofs and demolished a dozen or more buildings over Wayne, Summit, Stark and Portage Counties. As the result of this event, property damage was estimated at $1.5 million.

Copley Center, Ohio
F-0, April 19, 1995 3:00 pm & F-0
Fatalities: 0 Injuries: 0

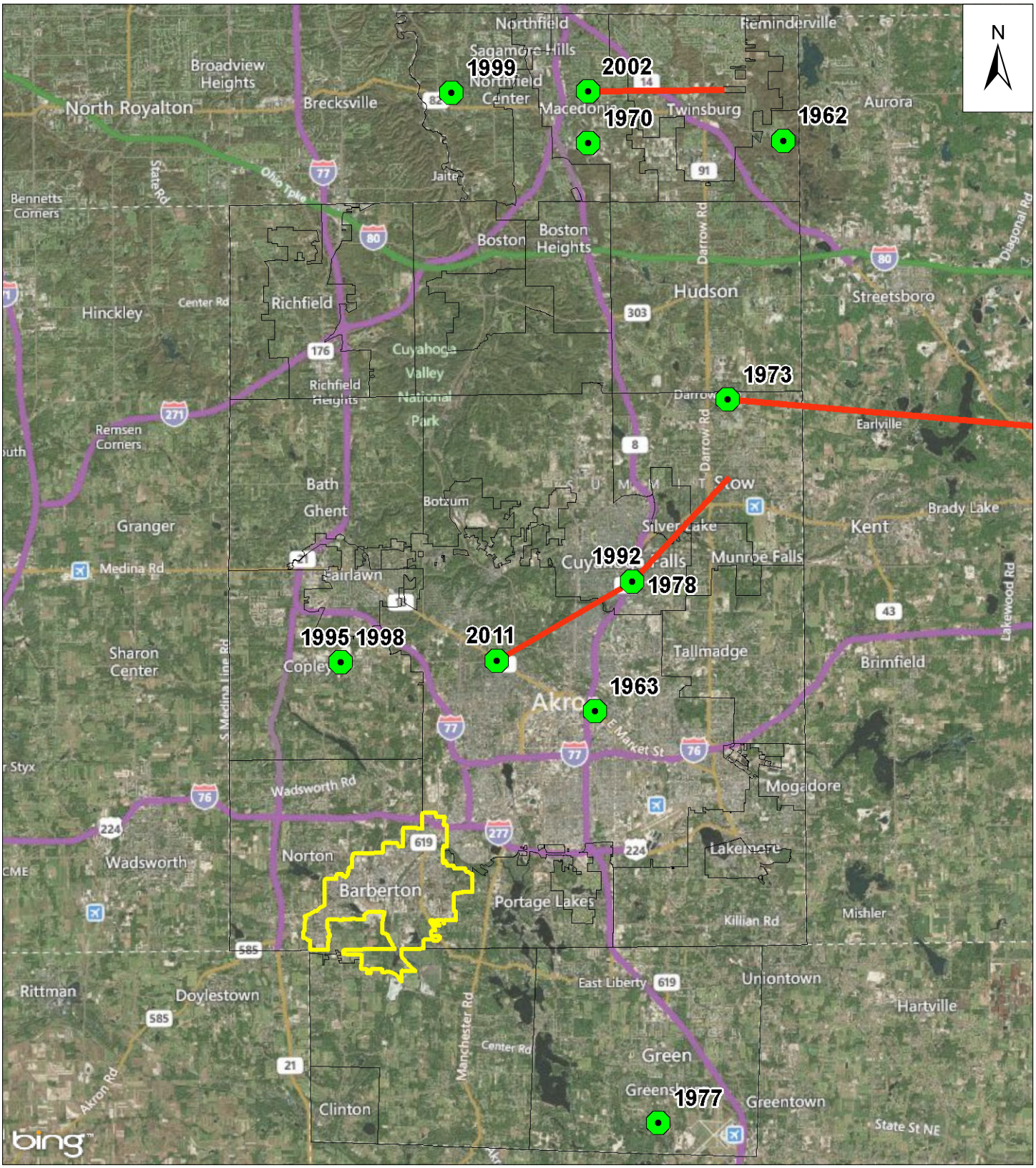
A tornado touched down just north of the intersection of Hametown Road and Copley Road and moved east to Copley Center. Several businesses were damaged including a plastics manufacturer where an office building and warehouse suffered roof and structural damage. Several trucks were overturned. A lumber and home center just outside of Copley Center suffered significant damage, estimated at about $500,000. About 20 homes suffered minor to moderate damage. Numerous trees were downed. A local haunted house business was struck and several dummy bodies were blown from the building. Residents mistook the dummies for real bodies and reported them to the police. As the result of this event, property damage was estimated at $1.5 million.

F-0; April 9, 1998 12:45 pm
Fatalities: 0 Injuries: 0

A weak tornado touched down briefly near Copley causing some minor roof damage. Property damage was estimated at $2,000.

Fairlawn, Ohio
EF-0, May 25, 2011 12:45 pm
Fatalities: 0 Injuries: 0

An EF0 tornado touched down in Fairlawn and traveled northeast for over four miles before lifting for good near Cuyahoga Falls. The damage survey suggested that the tornado may not have been in contact with the ground for much of the path length which was no more than 50 yards in width. Only intermittent damage was observed and it is likely that some of this was caused by straight line winds. Most of the damage was from fallen trees, but some buildings were also damaged. A church in Fairlawn lost its roof and several buildings sustained roof damage in downtown Cuyahoga Falls. Dozens of trees were either uprooted or snapped by the tornado. Several witnesses reported seeing a tornado in contact with the ground. As the result of this event, property damage was estimated at $200,000.



V:\1743\active\174332008\gis\mxd\Barberton_MHMP_Tornado.mxd
Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
National Climatic Data Center (NCDC)

Stantec

Legend

- Tornado Touchdowns
- Tornado Paths

Jurisdictions

- Other Jurisdictions
- City of Barberton

0 1
Miles
1 inch equals 19,400 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment

February 2015

Title

Figure 18. Tornado Impacts

3.6.2 Risk Assessment and Vulnerability Analysis / Potential Dollars Lost

The location, frequency and impacts of tornadoes cannot be accurately predicted. However, an analysis of historic events can provide a reasonable understanding of expected future risks.

According to NOAA and local sources, there have been 16 tornadoes/waterspouts in 11 unique years in Summit County reported since 1963, with total losses of approximately $19.5 Million. (please see Appendix C). The annual chance of occurrence for a tornado in Barberton is 2% (land area within Barberton makes up 2% of Summit County). The annualized risk in Summit County is approximately $400,000.

Table 17 displays the potential structure loss within City of Barberton, jurisdiction-wide. Due to the unpredictable nature of Tornado events, all structures are at risk. (Source: Summit County Building Footprints)

Table 17. Potential Structure Loss (Vulnerability Analysis for SHARPP)

Building Type	Number of Buildings	Exposure ($)
Residential	15,622	514,500,700
Non-Residential	2,190	239,820,090
Critical Facilities	0	0
Total	17,498	754,320,790

3.6.3 Future Development Risks and Mitigation Strategy

Due to the non-site-specific nature of this hazard, future development trends will have no significant effects on the occurrence of tornadoes. However, population growth and increased infrastructure and building stock will likely increase annual expected damages.

A listing of identified Mitigation Actions as part of this planning process can be found in **Appendix D.** The following goals can be achieved through the identified Mitigation Actions.

- Reduce risks through early emergency notification systems.
- Reduce impacts through response and recovery activities that are implemented during a disaster.
- Reduce impacts to critical facilities during/after an emergency by assessing vulnerability for each facility.
- Reduce impacts by providing adequate Storm Shelters during/after an emergency.

3.7 WINTER STORMS

Winter storm hazards include wind chill, ice storms, heavy snow, and blizzard conditions. Winter Storms are jurisdiction-wide and can affect all areas of the City. **Appendix F** provides further information and resources on winter storms.

3.7.1 Historic Events

The complete list of Winter Storm Events documented by NOAA since 1993 for Summit County is provided in **Appendix C.** Table 18 below contains a summary of these events for regional / statewide events including Summit County. During these events, multiple communities in Summit County experienced similar issues.

Table 18. Summary of Regional/Statewide Winter Storm Events impacting the City of Barberton

Hazards	Sum of Property Damage ($) *	Sum of Crop Damage ($)	Sum of Deaths	Sum of Injuries
Blizzard	800,000	0	1	0
Winter Weather	200,668,000	500,000	14	77
Total	**201,968,000**	**500,000**	**15**	**77**

***** Regional / Statewide Events

The events below were taken from a publication called "Ohio Winter Storm History through March 2013" published by the Ohio Insurance Institute (OII). (*2013 Dollar Value)

- **February 27-28, 2011**: A late February deluge that brought several inches of rain to parts of Ohio and significant flood, wind and water-related losses caused at least $68.9 million ($70.3M*) in insured losses. Nearly 15,900 claims had been filed through March 2011.
- **February 2011**: The "Groundhog Day Blizzard of 2011" that brought white-out conditions to Northwest Ohio and high winds, ice and snow accumulations to the southern and central portions of the state caused at least $23 million ($23.5M*) in insured losses and over 9,000 claims.
- **February 2010** winter storm series: According to the Ohio Insurance Institute (OII), insured losses from the series of February 2010 winter storms caused at least $28.2 million ($29.6M*) in losses, from 12,173 claims filed across the state.
- **February 11-12, 2009 windstorm:** Unseasonably warm air combined with an approaching cold front across the Ohio Valley resulted in wind gusts in the 50-60 mph range in many parts of the state. Darke County recorded the highest gust at 76 mph, according to the National Weather Service. A series of complex storms near Cincinnati also produced marginally severe hail. This winter windstorm caused at least $88.9 million ($94.9M*) in damages, based on preliminary insured loss estimates by OII.
- **January 4-6, 2005 winter storm:** OII estimates this snow and ice storm caused at least $38 million ($44.2M*) in insured losses in Ohio. 21 insurers reported their losses with totals ranging from 35 claims to about 2,600. Insured loss estimates ranged from $100,000 to over $6.4 million. According to OII survey results, insurers reported at least

14,800 claims from the storms through January 25, 2005. The January 4-6 storms combined ice, snow and rain. Massive power outages due to ice in the Cleveland-Akron corridor were reported as well as western and central portions of the state. Flooding was also reported, resulting in 59 counties being declared disaster emergencies by Ohio Governor Taft.

- **December 2004 holiday storm:** OII estimates from the holiday snow and ice storm resulted in at least $85 million ($102.2M*) in insured losses based on 27,119 claims. About 69% of the claims filed through mid-January '05 pertained to homeowners or renters insurance. The estimated homeowner's losses were $62.5 million for 18,657 claims. Losses in the personal auto line were estimated at just over 2,800 claims for $5.9 million. Commercial losses, based on 1,322 claims, were at least $11.8 million. The storm began December 22 and affected parts of the state throughout the Christmas holiday period. Massive power outages, ice and heavy snowfall were reported. Ohio Governor Taft declared emergencies in 20 counties.
- **February 2003 winter storm:** The February 2003 snow and ice storms that hammered several states from the Mid-Atlantic to New England resulted in preliminary insured losses of about $20 million ($24.8M*) in Ohio. According to PCS this was part of three winter storms during the first quarter 2003 that blanketed 15 states, causing $1.1 billion ($1.4B*) in insured losses.
- **January 1999 winter storms:** Snow, ice, freezing rain and high winds combined forces throughout the Buckeye state in a series of January 1999 winter storms that caused over $41 million ($55.8M*) in insured losses from at least 26,000 claims.
- **Blizzard of '96:** This dual winter storm system first hit the second week of January 1996, followed by more snow, ice and strong winds during the third week of January. OII estimates that insured losses from these two storms topped $46.2 million ($66.7M*) in the Buckeye state, with at least 28,500 claims filed. Total losses from the storms were $960 million ($1.4B*) from 485,000 claims in 17 states according to PCS.
- **Winter Freeze of '94:** Two separate winter storm events occurred January 14–20, 1994 affecting 20 states. It was followed up by an ice storm that hit parts of Ohio on February 8–9. OII preliminary figures found that at least $40 million ($61M*) in insured losses resulted from 24,740 claims around the state.
- **Blizzard of March 14, 1993:** The March 11–14 storm front affected the eastern third of the US and caused $1.75 billion ($2.74B*) in insured losses, the ninth costliest US catastrophe. States hardest hit were Florida, North and South Carolina and Georgia. Ohio preliminary claims were above 45,000 with insured losses of over $120 million ($187.8M*). PCS reported that Florida, North and South Carolina and Georgia were hardest hit by this storm.
- **Great Blizzard of '78** (January 26-28, 1978): Although no insured loss information is available from this massive storm that paralyzed the entire state for days, it's reported that it caused $73 million ($253M*) in agricultural losses alone, including livestock. In all, there were 51 storm-related fatalities in Ohio.

Federal Disaster Declarations were filed for the following winter storm events with impacts to Summit County. The descriptions of events were gathered from NOAA and FEMA.

- Federal Emergency Number EM-3198, December 22-24, 2004. A severe snowstorm impacted multiple counties throughout Ohio. Public Assistance funds were provided to the impacted counties.

- Federal Disaster Number DR-1580, December 22, 2004 - February 1, 2005. The snowstorm left more than 20 inches of snow in some areas and then was followed by unseasonable warmer temperatures in January 2005, which caused flooding and mudslides. 62 counties were included the federal list of declared counties. Approximately 3,700 private structures were damaged or destroyed throughout Ohio.

3.7.2 Risk Assessment and Vulnerability Analysis / Potential Dollars Lost

Because the location and impacts associated with winter storms are random in nature, the Planning Team utilized historic events to determine Barberton's susceptibility to winter storms. The NCDC has recorded 56 regional / statewide winter storms which included Summit County since 1993, with total losses of approximately $201,968,000. In the last 35 years, Summit County has experienced 13 major storms. Summit County also qualified for natural disaster assistance due to damages/losses caused by frost/freeze back in March – May 2012 (Source: Summit County Hazard Mitigation Plan – 2013). Based on these results, Summit County averages approximately one (1) to two (2) winter storm events per year.

Table 19 displays the potential structure loss within City of Barberton, jurisdiction-wide. Due to the unpredictable nature of Winter Storm events, all structures are at risk. (Source: Summit County Building Footprints)

Table 19. Potential Structure Loss (Vulnerability Analysis for SHARPP)

Building Type	*Number of Buildings	*Exposure ($)
Residential	16	514,501
Non-Residential	3	239,820
Critical Facilities	0	0
Total	19	754,321
*Realistic 0.1% of structures/value		

Similar to severe storms, critical facilities can be impacted most directly by winter storms through power outages. Those critical facilities for which power is crucial (i.e. hospitals, nursing homes, etc.) can be greatly impacted by winter storms and precautions must be taken for the provision of backup power generators. In terms of potential impacts on infrastructure and utilities, roads may be covered by snow and ice. Utility outages can be attributed to heavy winds and freezing temperatures.

3.7.3 Future Development Risks and Mitigation Strategy

Due to the non-site-specific nature of this hazard, future development trends will have no significant effects on the occurrence of severe storms. However, population growth and increased infrastructure and building stock will likely increase annual expected damages.

A listing of identified Mitigation Actions as part of this planning process can be found in **Appendix D.** The following goals can be achieved through the identified Mitigation Actions.

- Reduce risks through early emergency notification systems.
- Reduce impacts through response and recovery activities that are implemented during a disaster.
- Reduce impacts to critical facilities during/after an emergency by assessing vulnerability for each facility.
- Reduce impacts by providing adequate Storm Shelters during/after an emergency.

3.8 EARTHQUAKES

Earthquakes can affect hundreds of thousands of square miles; cause damage to property measured in the tens of billions of dollars; result in fatalities and injuries to widespread populations; and disrupt the social and economic functioning of the affected area. Earthquakes can collapse buildings and bridges, disrupt utilities, and sometimes trigger secondary disasters, such as landslides, avalanches, flash floods, and fires.

Appendix F provides further information and resources on earthquakes.

3.8.1 Historic Events

This type of an event is a regional-wide hazard. It is surprising to many Ohioans that the State has experienced more than 120 earthquakes since 1776, and that 14 of these events have caused minor to moderate damage. The largest historic earthquake in Ohio was centered in Shelby County in 1937. This event, estimated to have had a magnitude of 5.5 on the Richter scale, caused considerable damage in Anna and several other western Ohio communities, where at least 40 earthquakes have been felt since 1875. Northeastern Ohio, east of Cleveland, is the second most active area of the state. At least 20 earthquakes were recorded in the area since 1836, including a 5.0 magnitude event in 1986 that caused moderate damage.

The Ohio Department of Natural Resources (ODNR) Division of Geological Survey has established a 29 station cooperative network of seismograph stations throughout the State in order to continuously record earthquake activity.

The 29 stations of the seismograph network, which is called OhioSeis, are distributed across the state, but are concentrated in the most seismically active areas or in areas that provide optimal conditions for detecting and locating very small earthquakes that are below the threshold of human notice. These small micro earthquakes are important because they occur more frequently and help to identify the location of faults that may periodically produce larger, potentially damaging earthquakes.

Historic Quakes near the Barberton Area

According to Ohio Department of Natural Resources (ODNR) Division of Geological Survey and OhioSeis, there have been no earthquakes inside the Barberton city limits since recorded time. However, there have been a few quakes in the vicinity of the city. **Figure 19** shows the location of these events.

A 3.8 magnitude (0 kilometer depth) earthquake occurred in Northampton Township on January 18, 1885 at 10:30 in the morning. It had a Modified Mercalli Index of IV and was felt throughout an 11,000 square kilometer area. Unfortunately, there is no event narrative available for this incident.

On Christmas Day 1998, a 2.8 magnitude (0 kilometer depth) earthquake occurred near the Village of Silver Lake at 9:22 in the morning. No event narrative was available for this incident.

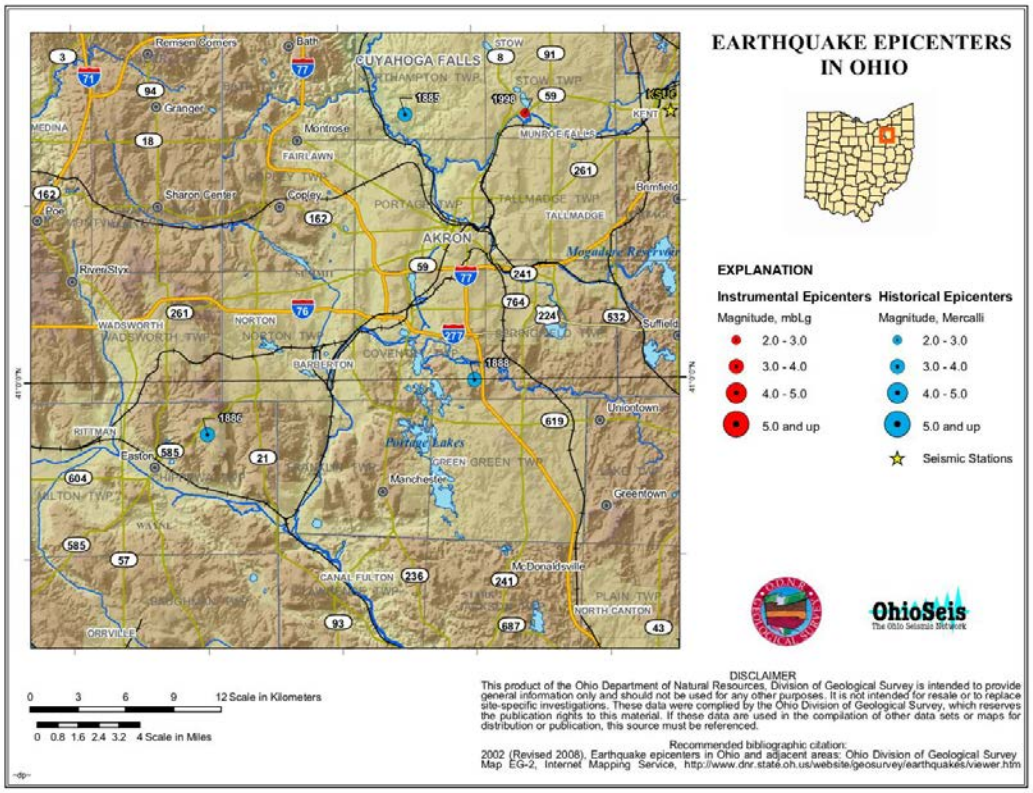


Figure 19. Historical Epicenters near the City of Barberton

3.8.2 Risk Assessment and Vulnerability Analysis / Potential DollarsVulnerability Analysis / Potential Dollars Lost

As with flooding, the potential for dollars lost due to earthquakes was estimated using the HAZUS-MH software. An AAL simulation in HAZUS-MH calculates the expected damages to building stock, infrastructure and utilities for a series of 8 events with increasing return periods. These events include the 100-, 250-, 500-, 750-, 1000-, 1500-, 2000- and 2500-year return

intervals. The results of each analysis is then transformed and combined to calculate a community's annual risk exposure or AAL.

The total AAL for earthquakes is $42,896. This result reflects the relatively low risk of earthquakes for the Barberton community; however, low risk should not be confused with "no" risk. Based on the simulations, a 500-year (0.2% annual chance) earthquake event could cause damages of approximately $3.85 Million and a 2500-year event (0.04% chance) approximately $42 Million. The results of the HAZUS analysis for earthquakes are included in **Appendix G**.

Table 20 displays the potential structure exposure within the Barberton area found in the HAZUS results in Appendix G

Table 20. Potential Structure Exposure (Vulnerability Analysis for SHARPP)

Building Type	Number of Buildings	Exposure ($) (Avg. Bldg. Value = 163,970.74; # Bldgs. x Avg. Value)
Residential	46	7,542,654.03
Non-Residential	0	0
Critical Facilities	0	0
Total	46	7,542,654.03

3.8.3 Future Development Risks and Mitigation Strategy

Earthquakes do not have a specific area or size that is usually associated with them. Therefore, all areas located within the City of Barberton have a probability of being affected by a seismic event.

Since earthquakes are a non-site specific hazard, current development trends have no affect other than the potential increased population and greater building stock and infrastructure that would be susceptible to earthquakes within the City of Barberton.

A listing of identified Mitigation Actions as part of this planning process can be found in **Appendix D.** The following goals can be achieved through the identified Mitigation Actions.

- Reduce risks through early emergency notification systems.
- Reduce impacts through response and recovery activities that are implemented during a disaster.
- Reduce impacts to critical facilities during/after an emergency by assessing vulnerability for each facility.

- Reduce impacts by providing adequate Storm Shelters during/after an emergency.

3.9 HAZARDOUS MATERIALS

3.9.1 Historic Hazardous Materials Incidents

The City of Barberton works directly with Summit County to identify Hazard Materials accidents. The Counties updated Hazard Mitigation Plan provides useful information to mitigate for Hazardous Materials.

Summit County has a Hazardous Materials Plan which outlines the mitigation, preparedness, response, and recovery actions to a hazardous materials spill or release. The plan was developed in accordance with Ohio Revised Code 3750.

Table 21 shows historical Hazardous Materials Incidents as taken from the 2013 Summit County Hazard Mitigation Plan.

Table 21. Hazardous Materials Incidents within Barberton

Date	Damage and Cost of Incident	Location of Incident
6/20/1995	Natural Gas Leak off of Snyder Ave. Personnel costs to the owner were a factor in this incident. Response costs were also a factor.	Herm's Court Snyder Ave Barberton, Ohio 44203
4/30/1997	Hazardous Material spill at a local business. Cost of response to the incident was $1,926.01.	103 5th St SE Barberton, Ohio 44203
12/24/1998	Chlorine leak in Barberton Citizens Hospital Laundry Room. Cost of incident was $5,602.03	Barberton Citizens Hospital Barberton, Ohio
10/1/1999	Hazardous Material Incident at Kreidel Plastics. Response cost was $22,276.55.	Kreidel Plastics 16 N Van Buren Ave Barberton, Ohio
2/17/2001	Hazardous Material Leak into the Tuscarawas River. Cost for response was $2,887.53.	Malco Products, Inc. 361 Fairview Ave Barberton, Ohio
9/14/2001	Hazardous Material incident at RI International.	RI International 440 West Hopocan Ave.
1/11/2012	Mercury spill hazmat incident at Barberton High school. Total incident costs $ 1,506.62.	Barberton 555 Barber Rd.
4/11/2013	Suspicious letter with unknown white powder. Total cost: $3,410.37	20 South Van Buren Barberton, Ohio

Appendix F provides further information and resources on hazardous materials accidents.

3.9.2 Infrastructure and Critical Facilities

The City of Barberton currently has nineteen (19) hazardous material sites. All sites are required to report quantities and types to the City of Barberton Fire Department.

3.9.3 Hazard Assessment and Vulnerability Analysis / Potential Dollars Lost

Due to the unpredictable nature of hazardous material accidents, all structures and population are at risk. Specific probabilities of occurrence or return intervals were not developed for this hazard. A hazard vulnerability analysis is completed for each EHS facility as part of Summit County's Hazardous Material Plan. Table 22 displays the potential structure exposure within the Barberton area.

Table 22. Potential Structure Exposure (Vulnerability Analysis for SHARPP)

Building Type	Number of Buildings	Exposure ($)
Residential	2,191	451,254,501
Non-Residential	1,766	915,644
Critical Facilities	104	21,383,773
Total	4,061	473,553,918

The vulnerability for hazardous material accidents usually does not affect structures as other hazards. However, a hazardous material accident can have significant impact on humans, animals, and transportation routes. This results in injuries, possible fatalities, and blocked transportation routes. Structures located near EHS facilities and along major transportation corridors are considered at higher risk.

3.9.4 Future Development Trends and Mitigation Strategy

Future risks associated with hazardous materials relate to the proximity of human populations to transportation, storage and handling facilities. For mitigation of future development risks, the City could consider limitations on residential development adjacent to high risk EHS facilities.

A listing of identified Mitigation Actions as part of this planning process can be found in **Appendix D.** The following goals can be achieved through the identified Mitigation Actions.

- Reduce risks through early emergency notification systems.
- Reduce impacts through response and recovery activities that are implemented during a disaster.
- Reduce impacts to critical facilities during/after an emergency by assessing vulnerability for each facility.
- Reduce impacts by providing adequate Shelters during/after an emergency.
- Locate EHS facilities and follow Summit County's Hazardous Material Plan for proper evacuation/mitigation procedures.

3.10 HAZARD PRIORITIZATION

The prioritization rankings were developed from each hazard analysis. These rankings were developed from three criteria: Probability, Vulnerability, and Severity of Impact. Table 23 provides a description of the three criteria. The community prioritization can be found in Table 24. Higher total score indicates a greater importance of that hazard.

Table 23. Probability, Vulnerability and Severity of Impact

Probability (frequency)	
Low (1)	<1% - 20% chance of occurrence per year
Medium (2)	21% - 100% chance of occurrence per year
High (3)	Excellent chance of more than one occurrence per year
Vulnerability (percentage of people)	
Low (1)	Less than 10% of the total population of the jurisdiction
Medium (2)	10% to 25% of the total population of the jurisdiction
High (3)	More than 25% of the total population of the jurisdiction
Severity of Impact (injuries, fatalities, personal property & infrastructure)	
Low (1)	Minor injuries (under 50) & property damage (under $1,000,000), or less than 24 hour shutdown of essential facilities
Medium (2)	Serious injury (more than 50), major property damage (structural stability) ($1,000,001 to $15,000,000), or 24 to 72 hour shutdown of essential facilities
High (3)	Multiple deaths (more than 5), property destroyed or damaged beyond repair (more than $15,000,000), or more than 3 days of shutdown for essential facilities

3.10.1 Community Specific Prioritizations

Table 24. Community Prioritization

Hazard	Average Annualized Loss ($)	Probability	Vulnerability	Severity of Impact	Total
Flooding	5,847,000	2	3	2	7
***Severe Storm**	1,987,583	3	2	2	7
****Severe Winter Storm**	N/A	3	2	1	6
Subsidence	N/A	2	1	1	4
Dam/Levee Failure	N/A	1	2	1	4
***Tornadoes**	398,051	1	1	2	4
Earthquakes	42,896	1	1	1	3
Hazardous Materials	N/A	1	1	1	3
*County/Regional Events only					
**Statewide/Regional Events only					

4.0 Mitigation Strategy

The Mitigation Strategy portion of this plan leverages the results of the hazard identification and vulnerability assessment to identify local risk reduction goals and actions. The process incorporated participation and coordination amongst the Planning Team to develop goals and actions that were Specific, Measurable, Achievable, Relevant and Time or schedule dependent (SMART).

The mitigation strategies developed within the Plan provide a blueprint for reducing the potential losses identified in the risk assessments and does not conflict with existing authorities, policies, programs and resources.

4.1 DEFINITION OF MITIGATION

FEMA defines mitigation as "sustained action that reduces or eliminates long-term risk to people and property from hazards and their effects." Mitigation is the ongoing effort at the federal, state, local and individual levels to decrease the impact of disasters upon families, homes, the jurisdiction and the economy. Mitigation also includes making existing and future development in hazard prone areas safer. A jurisdiction can steer growth to areas with fewer risks through non-structural measures such as regulations and land use plans. Preventing damages or loss to lives or property is the essence of mitigation. Incorporating mitigation into decisions relating to a jurisdiction's growth can result in a safer, more resilient jurisdiction, and one that is more attractive to families and businesses.

4.2 LOCAL HAZARD MITIGATION GOALS

The Mitigation Strategies were developed through work sessions, individual conversations, and meetings at the local level. The planning participants worked together to develop and complete a series of community mitigation worksheets. These worksheets encouraged the community to work with local resources to develop mitigation goals, activities, priorities, and capabilities. A copy of the worksheet provided to the community is attached as **Figure 20**.

During the November 13, 2013 stakeholder meeting, attendees reviewed the hazard profiles and results of the vulnerability assessments. The concept of risk mitigation activities was introduced and examples were discussed together. As a result of the process, the group ultimately developed several mitigation goals to reduce or avoid long-term vulnerabilities for hazards within each jurisdiction. These goals are provided in **Appendix D**.

CITY OF BARBERTON MULTI - HAZARD MITIGATION PLAN
Mitigation Strategy
February 11, 2015

Community Name/Department _____ Contact Name _____ Contact Phone No. _____
Mitigation Goals:

1. Preventative Activities. Reduce risks through regulations including building codes, development outside of hazardous areas, and local planning or capital improvement projects.
2. Property Protection. Reduce exposure to hazards through building or parcel specific activities such as flood proofing, structure acquisition, or retrofitting.
3. Emergency Services. Reduce impacts through response and recovery activities that are implemented during a disaster.
4. Structural Projects. Minimize impacts through projects, such as detention basins, tornado shelters, tornado sirens, etc.
5. Public Information. Assist residents to prepare for risks and protective measures to better protect themselves and their property.

Item Number	Goal Number	Mitigation Action	Responsible Agency & Contact Person	Funding Source	Implementation Timeline	Estimated Benefits*	Estimated Costs*
1.	1.						Medium
2.	2.						Low
3.	3.						Medium

t Rank Each Mitigation Action Higher = **1** Lower = **5**

"Benefit and Cost estimates should be based on these categories:

Less than $100,000 = Low
$100,000 - $500,000 = Medium
More than $500,000 = High

Figure 20 – Mitigation Strategies Worksheet

The overall goals and objectives of mitigation actions are designed to reduce the impacts from the hazards identified in this plan.

A. Reduce risks through regulations including building and zoning codes, development outside of hazardous areas, and local planning or capital improvement projects.

B. Reduce exposure to hazards through building or parcel-specific activities such as flood proofing, structure acquisition, or retrofitting.

C. Reduce impacts through response and recovery activities that are implemented during a disaster.

D. Minimize impacts through projects, such as detention basins, acquisition & demolition, elevation and other projects.

E. Assist residents to prepare for risks and protective measures to better protect themselves and their property.

4.2.1 Mitigation Activities by Type

The group focused upon various types of activities that could be performed to reduce the risk of natural hazards throughout their community. These activities were categorized as follows:

a. Prevention. (PA) Preventative activities are designed to keep current problems from getting worse and to minimize future problems. Preventative activities reduce a jurisdiction's vulnerability to hazard events. This type of activity is especially effective in hazard prone areas where development has not occurred. Preventative activity examples include the following:

   1) Planning and Zoning
   2) Floodplain regulations
   3) Local ordinances

b. Property Protection. (PP) Property protection activities are designed to adapt existing structures to withstand natural hazards or to remove structures away from hazard prone areas. Property protection activity examples include the following:

   1) Acquisition
   2) Relocation
   3) Foundation elevation
   4) Insurance – flood and homeowner's
   5) Retrofitting (includes activities such as wind proofing, flood proofing, and seismic design standards)

c. Emergency Services. (ES) Emergency services minimize the impact that a natural hazard has on the residents of a jurisdiction. Usually, actions are taken by emergency response services immediately before, during, or in response to a hazard event. Emergency service activity examples include the following:

1) Warning systems
2) Evacuation planning and management
3) Sandbagging for flood protection

d. Structural Projects. (SP) Structural projects lessen the impact of a natural hazard by changing the natural progression of the hazard. These types of projects are usually designed by engineers. Structural projects include the following:

1) Storm sewers
2) Floodwalls
3) Highway projects
4) Tornado shelters

e. Public Information and Awareness. (PI) Public information and awareness activities are used to educate the residents of a jurisdiction about the potential hazards that affect their area, hazard prone areas, and mitigation strategies they can take part in to protect themselves and their property. Public information and awareness activity examples include the following:

1) Public speaking events
2) Outreach projects
3) Availability of hazard maps
4) School programs
5) Library materials

4.3 IMPLEMENTATION OF MITIGATION ACTIVITIES

The Planning Team worked with community resources to develop mitigation activities based upon local vulnerabilities and capabilities. These actions were identified and prioritized using a prioritization scheme, generalized benefit/cost approach, and funding identification strategy. For each action developed, an action administrator or authority was defined along with an estimated timeframe for completing the activity.

The hazard mitigation actions developed were prioritized based upon the capacity of an action to eliminate or reduce risk, the category of activity performed, the generalized benefit to cost of each activity, and it's potential for funding.

4.3.1 Activity Prioritization

The Planning Team prioritized each activity based upon its ability to eliminate or reduce risk associated with the mitigation goal. The community's hazard prioritizations and benefit/cost were incorporated into the activity prioritization.

4.3.2 Activity Benefit-Cost Review

The Planning Team also considered the return on investment for each activity. Both the benefits and the costs were examined on a qualitative basis (i.e. High, Medium, and Low). The three categories were divided based on the estimated value of the benefits derived or the cost of developing the action or project. If the costs or benefits were expected to be less than $100,000, the category was low. If the costs or benefits were expected to surpass $100,000 but be less than $500,000, the category was medium. If the costs or benefits were expected to exceed $500,000, the category was high. The result produced a generalized approach for assessing relative benefits to cost. The Planning Team agreed that more detailed benefit cost analysis would be performed as necessary prior to the implementation of each activity. In cases of activities identified for funding through FEMA mitigation programs, the group recognized that FEMA approved benefit-cost analysis would be required.

4.3.3 Activity Funding and Implementation

The Planning Team considered and identified the funding resources that may be available for each activity. At this stage, no specific plans were developed to fund projects, but probable sources of funding were identified. In general, the identified source of funding corresponded to the implementing agency.

Most sources of public funding will require a detailed cost-benefit analysis of the proposed mitigation activities, as well as an analysis of potential alternatives. Development of mitigation actions should also include a Social, Technical, Administrative, Political, Legal, Environmental, and Economic (STAPLEE) analysis. Each of these criteria should be reviewed to determine the usefulness and potential for implementation. Difficulties in any of the seven criteria could potentially derail a mitigation action because of unforeseen opposition or ramifications.

4.4 LOCAL MITIGATION STRATEGY AND CAPABILITIES ASSESSMENT

This plan includes specific actions for the City of Barberton. These actions are based on goals developed to address the risks identified throughout the region. It is the intent of each identified department or agency to implement these actions using practices that are cost-effective, environmentally sound, and technically feasible.

Following the Plan's adoption, the Planning Committee will continue to work with Barberton's departments and other regional organizations to implement mitigation strategies on a regional basis where feasible. While the commitment to implementing this strategy is strong, the potential for success is directly linked to each department's capability.

The purpose of the capability assessment is to identify the potential hazard mitigation opportunities available to each department that may already exist as part of daily operations (e.g. code enforcement, operations, maintenance, etc.).

This assessment will highlight the positive measures already in place in the agency/department as well as identify weaknesses that could increase vulnerability. The capability assessment serves as the foundation for an effective hazard mitigation strategy. By establishing goals and objectives for agencies/departments to pursue under the City of Barberton Plan, it ensures that the goals and objectives that are decided upon are realistically attainable given local resources.

4.4.1 Local Mitigation Practices

The following defines local practices already in place throughout the city that encourage or promote mitigation activities. These practices reside within existing policies, ordinances, programs, and other planning efforts.

Mitigation Management Policies. The Emergency Operations Plan (EOP) provides for an integrated city-wide emergency preparedness and response plan, utilizing public, nonprofit, and private resources. The plan includes roles and responsibilities of persons/departments in charge of dispatching help during a natural hazard, rules that are followed, evacuation procedures dispersed by the transportation officer to be followed, etc.

Existing Plans. In general, the City's policies encourage cooperation and coordination within its jurisdictional agencies, as well as cooperation, including mutual aid compacts, between the county and neighboring municipalities within the region. The EOP provides for an integrated city-wide emergency preparedness and response plan, utilizing public, nonprofit, and private resources.

Mitigation Programs. The main mitigation programs are the City's floodplain management regulations and participation in and administration of the NFIP. In cooperation with Summit County, the City of Barberton began their floodplain modernization with ODNR in Fiscal Year 2005. This process began with a scoping meeting held on July 27, 2005 and culminated with revised maps becoming effective on July 20, 2009 when they were formally adopted by the City. Under the City Planning Commission, the City's Floodplain Management Program and regulations were adopted in 2009 and are currently in effect. Section 3.0 designates a Floodplain Administrator and duties of that Office, to include updating regulations and enforcement of such regulations under Section 6.0. Additionally, the Floodplain Administrator routinely monitors flood hazard areas to enforce regulations and provide community assistance such as encouraging owners to maintain flood insurance policies. Additional programs include:

a. The City's Floodplain Regulations are aimed at restricting development in the floodplain. The City Zoning Ordinance restricts development to those uses which are unlikely to be severely impacted by floodwaters, such as agricultural fields, camps, parks, etc. In addition, the ordinance requires that any development in the floodplain not decrease the capacity of the floodplain to contain flood waters. The Subdivision Ordinance restricts most development in flood-prone areas.

b. City of Barberton severe weather warnings will be disseminated by broadcast radio and television stations. In addition, the emergency radio warning systems may be used to alert residents of the city.

c. Communicating to the Public

   i. Barberton is establishing a New Siren Warning System.

   ii. Barberton has established a Nixle Community Information Service System for area alerts.

   iii. Barberton uses twitter to broadcast emergency information.

d. Safety Forces Communications

   i. Barberton is upgrading its Radio Communication System for compatibility with other Local Community Safety Forces.

   ii. Barberton has joined the City of Norton and Copley Township to establish Southwest Summit Communications (SWSCOM) that will serve as a dispatch station for fire and emergency management services for the three communities.

   iii. Barberton Has Established a Call Tree for Critical City Departments in Responding to Emergencies When the Emergency Operations Center is activated.

   iv. Weather Forecasting via SWSCOM, which will receive access to the Barberton Weather Subscription Service Earth Networks. They can provide services for forecasting, severe weather notifications and area lightning strikes.

4.4.2 Available Funding Resources

There are several sources of funding for both pre- and post-disaster hazard mitigation policies and projects. While all mitigation techniques will save money by avoiding different types of losses, the implementation of mitigation efforts can be costly and well beyond the City's capacity to fund the mitigation activity. There are existing federal and state funding programs that can be utilized for funding assistance. The list of some sources of funding presently available is provided below. This list is not comprehensive, as new programs can be developed or existing programs can be eliminated or modified over time. Other resources are found in Appendix D.

HMGP

The Hazard Mitigation Grant Program (HMGP) is authorized by Section 404 of the Robert T. Stafford Disaster Relief and Emergency Act, as amended. The key purpose of HMGP is to ensure that the opportunity to take critical mitigation measures to reduce the risk of loss of life and property from future disasters is not lost during the reconstruction process following a disaster. HMGP is available, when authorized under the Presidential major disaster declaration, in areas of the State requested by the Governor.

PDM

The Pre-Disaster Mitigation (PDM) program is authorized by Section 203 of the Stafford Act, 42 USC 5133. The PDM program is designed to assist States and local communities to implement a sustained pre-disaster natural hazard mitigation program to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding from future major disaster declarations.

FMA

The Flood Mitigation Assistance (FMA) program is authorized by Section 1366 of the National Flood Insurance Act (NFIA) of 1968, as amended with the goal of reducing or eliminating claims under the National Flood Insurance Program (NFIP).

SHARPP

The State Hazard Analysis Resource and Planning Portal (SHARPP) has additional resources listed in the Grants section under Other Mitigation Grants. Go to http://ohiosharpp.ema.state.oh.us/OhioSHARPP/Grants.aspx#otherMitigationGrants for more information.

The City of Barberton is well positioned to perform successful implementation of the activities identified within the Plan. As a result, the community is better prepared to achieve its identified goals for mitigating local risk to natural hazards throughout the region.

5.0 Plan Maintenance

Plan Maintenance is the process by which the City of Barberton Plan will be monitored, evaluated, and updated within a five-year cycle. When updated, the Plan will be reviewed, revised, and resubmitted to the State/OEMA within five years of the Plan for approval by FEMA Region V. As appropriate, the Plan will also be evaluated after a disaster, or after unexpected changes in land use or demographics in or near hazard areas. The Planning Committee also will be kept apprised of a change in federal regulations, programs and policies, such as a change in the allocation of FEMA's funding for mitigation grant programs. These evaluations will be addressed in the annual progress report for the Plan and may affect the Action Plan for Mitigation goals and activities.

5.1 MONITORING, EVALUATING, AND UPDATING THE PLAN

5.1.1 Monitoring

The Community Representatives will continue to monitor the status and track the progress of the Plan elements on an annual basis. The Community Representatives will oversee the

progress made on the implementation of the identified actions and update the Plan as needed to reflect changing conditions. Representatives will also meet annually to evaluate the Plan progress and recommend updates.

5.1.2 Evaluating

Evaluation of the Plan will not only include checking the implementation status of mitigation actions, but also assessing their degree of effectiveness and assessing whether other natural hazards need to be addressed and added to the Plan (man-made hazards). This will be accomplished by reviewing the benefits (or avoided losses) of the mitigation activities that were in place within each jurisdiction. These will be compared to the goals the Plan has set to achieve. The team will also evaluate whether mitigation actions need to be discontinued or modified in light of new developments or changes within the community. Public comment on the Plan and achievement of goals and objectives will also be solicited annually during the evaluation by the committee. The process will be documented by the Community Representatives and submitted to the City's Stormwater and Floodplain Department. Any updates will be included in the Plan at the next update.

5.1.3 Updating

As required by part 201.6(c)(4)(i) of the Local Hazard Mitigation Plan Review Crosswalk, this plan will be updated within five years of the date of the FEMA approval of the plan. The plan may be updated earlier, at the discretion of the Planning Committee and its jurisdictions. Also, the Committee's ability to update the mitigation process by adding new data and incorporating it into the mitigation plan, will allow for the efficient use of available resources, staff, and programs. Any changes in the Plan will be documented and appended in a section titled "Amendments". The Action Plan will be maintained as an Appendix so it can remain a living document.

5.2 IMPLEMENTATION THROUGH EXISTING PROGRAMS

The identified action projects address reducing the effects of hazards on new buildings and infrastructure as well as existing buildings and infrastructure. Activities also incorporate mitigation activities into other planning mechanisms and recommends mitigation projects that can be integrated into Master Plans, Flood Mitigation Plans, Capital Improvement Plans, Land Use Plans, Emergency Management Plans, Zoning Ordinances, Building Codes, and Post-Disaster Mitigation Policies and Procedures where appropriate. In addition, projects will be implemented through existing or ongoing programs.

5.3 CONTINUED PUBLIC PARTICIPATION

In order to have continued public support of the mitigation process, it is important that the public be involved not only in the preparation of the initial plan, but also in any modifications or updates to the plan. To ensure that public support is maintained, the following actions may be taken by the Community Representatives or Project Administrator:

- Develop informational mailings to be distributed to the public about mitigation efforts in the City and updates made to the Plan.
- Develop mitigation flyers or mailings that contain mitigation activities and actions that promote reducing damages and risks of natural hazards.
- Develop a survey following a Presidential, Emergency, or State Declaration to solicit public input about current or possible future mitigation activities, and place it on the City website.
- Hold a public meeting prior to plan updates.

6.0 Conclusion

The City of Barberton is vulnerable to many hazards, especially flooding. The large number of repetitive loss properties in the city can be mitigated with the assistance of federal grants. In addition, the planning participants developed a list of several actions that will mitigate the risks to the citizens of the city, if they are enacted. By adopting the City of Barberton Multi-Hazard Mitigation Plan and incorporating the results into other planning and regulatory mechanisms, the City of Barberton can become a safer place to live and work.

Appendix A

Plan Adoption

LOM:raf
04/06/2015

Presented by: Mr. Soyars

RESOLUTION NO. 51-2015

TITLE: NATURAL HAZARDS MITIGATION PLAN

A RESOLUTION APPROVING AND ADOPTING THE CITY OF BARBERTON NATURAL HAZARDS MITIGATION PLAN, AND DECLARING AN EMERGENCY.

WHEREAS, this plan is the result of hazard mitigation planning efforts that begun in The City of Barberton in 2011 when the City received a grant to develop and adopt a Natural Hazards Mitigation Plan for the City and presents an evaluation of the potential negative consequences of the natural hazards that may affect the City of Barberton and proposed strategies that will reduce or mitigate losses; and

WHEREAS, adoption and implementation of this plan ensures that the City of Barberton continues to be eligible to apply for and receive certain Federal grant funds that are administered by the State of Ohio (OEMA) and the Federal Emergency Management Agency (FEMA) and this plan complies with the requirements of the Disaster Mitigation Act of 2000 and its implementing regulations published in Title 44 of the Code of Federal Regulations (CFR) Section 201.6; and

WHEREAS, the State of Ohio (OEMA) and the Federal Emergency Management Agency (FEMA) have previously approved the updated Mitigation Plan; and

WHEREAS, this Resolution should be passed as an emergency measure under suspension of the rules in accordance with Section 14 of the City Charter in order to be compliant with the Federal Disaster Mitigation Act of 2000, satisfy the requirements of FEMA and Ohio EMA and thereby not jeopardize any potential future mitigation funding for the City; and

WHEREAS, in that it is deemed necessary in order to provide for the immediate preservation of the public peace, property, health, and safety of the City of Barberton, Ohio, and its citizens, and to provide for the efficient daily operation of Municipal Department of the City of Barberton, Ohio the City Council of the City of Barberton, Ohio, finds that an emergency exists regarding the aforesaid, and that it is advisable that this **Resolution** be declared an emergency measure which will take immediate effect in accordance with Section 5.13 of the City Charter upon its adoption; and

NOW, THEREFORE, BE IT ORDAINED by the Council of the City of Barberton, State of Ohio:

SECTION 1. This City Council approves and adopts the City of Barberton Natural Hazards Mitigation Plan.

SECTION 2. If any section, phrase, sentence, or portion of this Resolution is for any reason held invalid or unconstitutional by any Court of competent jurisdiction, such portion shall be deemed a separate, distinct, and independent provision, and such holding shall not affect the validity of the remaining portions thereof.

SECTION 3. That it is hereby found and determined that all formal actions of this Council concerning and relating to the passage of this ordinance were taken in an open meeting of this Council and that all deliberations of this Council and of any of its committees that resulted in such formal action were meetings open to the public in compliance with the law.

SECTION 4. That this ordinance is hereby declared to be an emergency measure necessary for the immediate preservation of the public peace, health, safety, convenience and welfare of the City of Barberton and the inhabitants thereof, in order for the project to commence as soon as possible, and provided it receives the necessary votes required by the City Charter, shall be in full force and effect from and after its passage and approval; otherwise to be in full force and effect from and after the earliest period allowed by law.

Passed April 13, 2015

Clerk of Council

President of Council

Approved April 14, 2015

Mayor

OHIO DEPARTMENT OF PUBLIC SAFETY
SAFETY · SERVICE · PROTECTION

- Bureau of Motor Vehicles
- **Emergency Management Agency**
- Emergency Medical Services
- Office of Criminal Justice Services
- Ohio Homeland Security
- Ohio Investigative Unit
- Ohio State Highway Patrol

John R. Kasich, Governor
John Born, Director
Evan W. Schumann
Executive Director

Emergency Management Agency
2855 West Dublin-Granville Road
Columbus, Ohio 43235-2206
(614) 889-7150
www.ema.ohio.gov

June 15, 2015
EMC-2011-PD-0002

Mr. Mike Vinay, Director of Public Service
City of Barberton
576 West Park Avenue
Barberton, Ohio 44203

RE: City of Barberton, Ohio Multi-Hazard Mitigation Plan

Dear Director Vinay,

Congratulations on the final Federal approval for the City of Barberton as a participant in the updated Hazard Mitigation Plan.

In accordance with 44 CFR 201.6(d)(3), the expiration date of the plan is **June 8, 2020**.

Should you have any questions please contact Dean Ervin at 614/799-3681, by fax at 614/799-3526 or dervin@dps.state.oh.us email.

Sincerely,

Steven A. Ferryman, CFM
State Hazard Mitigation Officer
Ohio EMA / Mitigation Branch

Attachment: FEMA Region V letter dated June 8, 2015

Cc: Sharon Rolf, Mitigation Specialist
Bob Zehentbauer, Regional Supervisor
Rudi Blaser, Planner 3
Chas Keeley, Planner 3
Ms. Valerie DeRose, Director, Summit County Emergency Management Agency
File

SAF/de

U.S. Department of Homeland Security
Region V
536 S. Clark St., 6th Floor
Chicago, IL 60605-1509

FEMA

JUN 0 8 2015

Mr. Steve Ferryman
Mitigation and Recovery Branch Chief
Ohio Emergency Management Agency
2855 W. Dublin-Granville Road
Columbus, Ohio 43235-2206

Dear Mr. Ferryman:

Thank you for submitting the adoption documentation for the City of Barberton Hazard Mitigation Plan. The plan was reviewed based on the local plan criteria contained in 44 CFR Part 201, as authorized by the Disaster Mitigation Act of 2000. Barberton met the required criteria for a single jurisdiction hazard mitigation plan and the plan is now approved for the City.

The approval of this plan ensures continued availability of the full complement of Hazard Mitigation Assistance (HMA) Grants. All requests for funding, however, will be evaluated individually according to the specific eligibility and other requirements of the particular program under which the application is submitted.

We encourage Barberton to follow the plan's schedule for monitoring and updating the plan, and continue their efforts to implement the mitigation measures. The expiration date of the City of Barberton Plan is five years from the date of this letter. In order to continue project grant eligibility, the plan must be reviewed, revised as appropriate, resubmitted, and approved no later than the plan expiration date.

Please pass on our congratulations to the City for this significant action. If you or the community has any questions, please contact Rebecca Leitschuh at (312) 408-4421 or Rebecca.Leitschuh@fema.dhs.gov.

Sincerely,

Christine Stack

Christine Stack, Director
Mitigation Division

Appendix B

Stakeholder Involvement

	Agency/Organizations	Department	Name	E-mail
	City of Barberton	Mayor	William Judge	mayor@cityofbarberton.com
	City of Barberton	City Council, President	Fred Maurer	fmaurer@cityofbarberton.com
	City of Barberton	City Council, At-Large	Michael Soyars	msoyars@cityofbarberton.com
	City of Barberton	City Council, At-Large	Carla Debevec	cdebevec@cityofbarberton.com
	City of Barberton	City Council, 1st Ward	Gary Endres	gendres@cityofbarberton.com
	City of Barberton	City Council, 2nd Ward	John Lysenko	jlysenko@cityofbarberton.com
	City of Barberton	City Council, 3rd Ward	John Wagner	jwagner@cityofbarberton.com
	City of Barberton	City Council, 4th Ward	Craig Megyes	cmegyes@cityofbarberton.com
	City of Barberton	City Council, 5th Ward	Terry Avant	tavant@cityofbarberton.com
	City of Barberton	City Council, 6th Ward	Carol Frey	cfrey@cityofbarberton.com
	City of Barberton	Clerk of City Council	Renee Fox	rfox@cityofbarberton.com
	City of Barberton	Service Director	Michael Vinay	mvinay@cityofbarberton.com
	City of Barberton	Utilities Director	Jim Stender	jstender@cityofbarberton.com
	City of Barberton	Planning Director	Joe Stefan	jstefan@cityofbarberton.com
	City of Barberton	Police Chief	Vince Morber	vmorber@cityofbarberton.com
	City of Barberton	Fire Chief	Kim Baldwin	Kbaldwin@cityofbarberton.com
	Summit Co.	Health Dept.	Bob Hasenyager	bhasenyager@schd.org
	Summit Co.	Emergency Management Agency	Valerie DeRose	vderose@summitoh.net
	Summit Co.	Summit County Engineer	Alan Brubaker, P.E., P.S.	abrubaker@summitengineer.net
	City of Akron	Director of Public Service	John Moore	Jmoore@akronOhio.gov
	City of Norton	Mayor	Mike Zita	mayorzita@cityofnorton.org
	City of Norton	Engineering	Dave White, P.E.	dwhite@summitengineer.net
	Coventry Township	Zoning	George Beckham	zoning@coventrytownship.com
	City of New Franklin	Mayor	Al Bollas	mayor@newfranklin.org
	Ohio EMA	Mitigation Branch - Chief	Steve Ferryman	sferryman@dps.state.oh.us
	Ohio EMA	Mitigation Branch	Dean Erwin	derwin@dps.state.oh.us
	Ohio Dept. Of Natural Resourses	Program Mgr, Floodplain Mgmt.	C. Thoms CFM	christopher.thoms@dnr.state.oh.us
	PPG	Facilitiy Engineer	Mario Narbutaitis	mjnarbutaitis@ppg.com
	Barberton Community Hospital	Facilitiy Engineer	Ricki Gerber	rickig@summahealth.org
	Babcock & Wilcox	Facilitiy Engineer	Jim Smart	jssmart@babcock.com
	American Red Cross	Summit & Portage Co.	Joseph Cavarett	joe.cavaretta@redcross.org
	Copley Township	Trustee	Scott Dressler - President	sdressler@copley.oh.us
	Copley Township	Trustee	Dale Panovich - VP	dpanovich@copley.oh.us
	Copley Township	Trustee	Helen Humphrys	hhumphrys@copley.oh.us
	Corp.	Director	Scott Wagner	scottwagner@bcdc.org
	Barberton Community Foundation	Director	Larry Lallo	llallo@barbertoncf.org

	BARBERTON FLOOD ACTION COMMITTEE			
		Citizen Member	Barbara J. Coburn	bjcoburn@ameritech.net
		Citizen Member	Sara Johnson	jnsjohnson@hotmail.com
		Citizen Member	Shorter Griffin	shortergriffin@hotmail.com
		Citizen Member	Dan Pelligrini	danpellegrini@yahoo.com
		Mayor	William Judge	mayor@cityofbarberton.com
		Service Director	Michael Vinay	mvinay@cityofbarberton.com
		Planning Director	Joe Stefan	jstefan@cityofbarberton.com
		Utilities Director	Jim Stender	jstender@cityofbarberton.com
		Stormwater/Floodplain Admin.		
		Police Dept.	Martin Eberhaart	meberhart@cityofbarberton.com
		Fire Dept.	Dave Conner	ryback@neo.rr.com
		Utilities Dept.	Bryce Kuhl	bkuhl@cityofbarberton.com
		Street Dept	Tom Pasternak	tpasternak@att.net
		Stormwater Manager	Caroline Knorr	cknorr@cityofbarberton.com

Agenda

City of Barberton Hazard Mitigation Plan

Kickoff Meeting

Thursday, January 31, 2013: 1:00 PM

1) **Introduction**

2) **Background**

- History of Flooding and other Natural Hazards
- Existing Grant: Purpose and Time Frame

3) **Planning Process Review**

- Advisory Committee Meeting / Data Collection
- Hazard Identification
- Risk Assessment
- Mitigation Planning
- Plan Review and Adoption

4) **Initial Advisory Committee Meeting**

- Participating City Departments
- Additional Local Stakeholders
- Public Involvement
- Location / Date / Time

5) **Project Schedule**

6) **Administration / Financials**

7) **Action Items**

Meeting Notes

Kickoff Meeting

City of Barberton Hazard Mitigation Plan

Stantec

Date/Time:	January 31, 2013 / 1:00 PM
Place:	576 West Park Avenue, Barberton, OH 44203
Attendees:	Keltyka, Alan; Palmer, Elwood; Stender, James; Menninger, John; Whitehead, Emily
Absentees:	

Item:

City Tour (1:00-2:00pm)

Alan Keltyka took John Menninger and Emily Whitehead on a tour of the City of Barberton to highlight flooding concerns throughout the City. Alan mentioned the following items on the tour:

- Alan provided a packet of information to Stantec regarding Significant Storms and Flooding from 2007-2012, Areas of Barberton Flooding, and two maps of flood events on August 20, 2007 and July 19, 2011.
- He and other City staff take measurements of high water marks after significant flood events.
- Wolf Creek backs up and floods towards 14th Street. The 14th Street area also gets hit with runoff from higher ground the opposite direction of Wolf Creek. This is one of three major problem flooding areas in the City as designated by the Flood Action Committee.
- The area between 19th and 21st get localized flooding that subsides within a few hours.
- The last time the City received FEMA disaster funding was 2003-2004 around Memorial Day after a flood event.
- The original FEMA Flood Insurance Rate Maps (FIRM) for Barberton are from 1981. Then FEMA re-did the maps in 2009. In 1981 there were 150 structures in the Special Flood Hazard Area (SFHA) and in 2009 that number increased to around 400 structures.
- The Tuscarawas River was channelized in the 1950's.
- South Barberton is another problematic flooding area and also has the highest potential for mitigation. Some mitigation project ideas include: conversion to flood storage or addition of a pump station. The Stanley and Bell Streets were

added to SFHA in latest FEMA DFIRM release. The biggest problem in this newly added area is some newer homes that were built with basements.

- There is an inflow and infiltration (I&I) problem throughout the City.
- Only gaging station is on the Canal which only raises about six inches. The canal has a towpath which is complete through Summit County. Eventually the Canal will make it to the Ohio River.
- Mud Run floods Eagon Street and a number of industrial buildings that flood.
- There is a lot of yard flooding in Barberton.
- Alan estimates there have been four or five 100-year flood events since 2006 (that he knows of).
- The worst flooded area is not mapped on the FIRM and results from the Unnamed Tributary to the Tuscarawas River. This flooding results from sheet flow.

Kickoff Meeting (2:00-3:30pm)

- Barberton was a participant in the Summit County Hazard Mitigation Planning process but was told by Ohio EMA that they needed their own HMP.
- Barberton's storm water system was mapped in GIS in the early 2000's. This data can be shared with Stantec for HMP use.
- The Flood Advisory Committee (FAC) was started in January 2012 by the Mayor and includes Elwood and Diane. Alan will provide minutes from the FAC meetings thus far.
- Stantec will send Alan the list of data and documents that we normally ask for during HMP process.
- Alan will also provide that latest quarterly report.
- Everyone present at the meeting had a preliminary discussion regarding the hazards of concern. The list includes: Flood, Storm (Wind), Coal Mines (sinkholes), Dam Failure, Tornado, and Severe Winter Storms.
- The City has two (2) I&I studies on-going. Barberton would like us to include the sanitary sewer problems and actions in the HMP.
- Barberton had five (5) bypass events in 2011 at the Water Treatment Plant. The Waste Water Treatment Plant was also bypassed in 2011.
- There is also some problem with erosion in the City.

- Alan has many flooding pictures that can be provided for use in the HMP.

- Stantec will provide a draft schedule to Alan for review. This draft schedule will include a general idea of when to hold the meetings needed during the HMP: Risk Analysis, Mitigation Planning, and Review the Draft Plan. Alan thought the final plan needed to be completed by March 2014.

- Invoices should be sent to Alan's attention.

- Stantec should make a list of who is normally invited to the initial advisory committee meeting for the HMP.

- Other than the plan, Barberton is looking for help with grant planning for the future. Advice on how to obtain grants in the future.

- John mentioned that the next phase for the project is Risk Analysis. We are looking for historic records of past hazard events. Alan suggested that newspaper accounts are usually pretty poor in terms of historical records. Past wind events include Hurricane Ike and another event around July 4th 1998. The Summit County HMP should have pretty good record of past events.

- There is some problem locally with coal mine subsidence. The State came in to address the issue in 2004 but was not able to fix everything.

- Earthquakes are a concern. Barberton felt a jolt from the Virginia earthquake a couple of years ago. Unreinforced masonry is a concern in Barberton. John mentioned that we will use FEMA's HAZUS software program to assess ground acceleration and estimate damages.

- Dam failure is a concern. There are two Pittsburg Plate & Glass (PPG) owned dams within the City that have full dam failure studies available: Columbia Lake and Lake Dorothy. James mentioned a reservoir dam that is owned by the City. Burgess and Niple have been studying the dam and may have some information or data available.

- The City of Barberton is 120 years old and much of the infrastructure was built at the turn of the Century. Failure of the infrastructure is a concern.

The meeting adjourned at 3:30 PM
The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

STANTEC CONSULTING SERVICES INC.

John Menninger
Project Manager
John.Menninger@stantec.com

Agenda

City of Barberton Hazard Mitigation Plan

Initial Stakeholder Meeting & Risk Assessment

Wednesday, November 13, 2013: 6:30 PM

1) **Introduction**

2) **Hazard Mitigation Plan Overview:**

- **Goal of Hazard Mitigation Plan:** Protect lives and property through identification of County specific hazards and development of hazard mitigation projects.
- **Meeting Purpose:** Introduce the Hazard Mitigation Planning process to local stakeholders and solicit input and feedback.

3) **Data Inventory**

- Critical Facilities
- Population/Structural Vulnerabilities

4) **Hazard Risk Analysis**

- Methodology and Data Sources
- Hazard Risk Assessment & Vulnerabilities
- Prioritization and Rankings
- Mitigation Project Development

5) **Next Steps Forward**

- Develop Mitigation Actions
- Planning Schedule

Meeting Notes

Risk Assessment Meeting

City of Barberton Hazard Mitigation Plan

Stantec

Date/Time:	November 13, 2013 / 6:30 PM
Place:	YMCA Community Room, Barberton, OH 44203
Attendees:	Keltyka, Alan; Palmer, Elwood; Stender, James; Sheridan, Diane; DeRose, Valerie; Davis, Brandon; Coburn, Barb; Griffin, Shorter; Stefan, Joe; Knorr, Caroline; Calderone, David; Menninger, John; Whitehead, Emily; Pooler, Adam
Absentees:	

Risk Assessment Meeting (6:30-9:00pm)

- Introductions were given out amongst the attendees. Mr. Menninger started out on the Plan and Meeting Goals and Overview. The schedule was introduced to the group. John and Alan mentioned that the FEMA/OEMA grant will be extended, which could impact the schedule.

- John then went into the hazards agreed upon at the kickoff meeting. He asked if there were any other hazards of concern.

    - Summit County EMA Director Valerie DeRose suggested including hazardous materials as a hazard. The statistics are all available inside the updated Summit County Plan. This hazard will be considered as an addition to the list.

- Mr. Pooler then went into the Risk Analysis portion. Adam first introduced the Critical Facilities currently identified by Stantec. He then encouraged the attendees to identify all critical facilities, which will be incorporated into the plan.

- Adam then described the flooding hazard analysis. The summary of events and future probability was discussed.

- Mr. Keltyka commented on the recorded damages from flood events in 2007 & 2011. He then described how the 2013 flood started on a Wednesday and may have subsided by Sunday. He also has the latest amount of NFIP claims and losses paid for Barberton.

    - A study on Robinson Ave. has been contracted out, but has not started.

    - The Flood Action Committee has identified South Barberton as the

highest priority area due to the sewage backups.

- Alan then mentioned how the city is looking at the cost of upgrading Robinson retention pond versus buying out 3 homes. The cheaper option at the moment is buying out the homes.
- Robinson and 5th experience flooding the making the road impassible for EMS vehicles to the Hospital. Considerations for planning routes of emergency services during a hazard have been considered.
- The 17th St. flooding concerns are the City's lowest priority.
- The 5th St. NE area is mostly industrial and commercial.
- The Van-Hyning neighborhood's storm system is under capacity for what it intakes.
- The Orchard St. and Evergreen Ave. intersection is considered to be a flooded bowl.

- The attendees discussed how the Cost/Benefit requirement is currently being waived for the Repetitive Loss program. Mr. Steve Ferryman had provided this information to Mr. Keltyka during the OFMA conference. Mr. Ferryman was not aware of how long this will be waived.
- Mr. Keltyka has more information / data to report on subsidence in other areas of the city. Subsidence is almost exclusively limited to south of the county. The Subsidence prioritization may change due to the updated areas.
- Mr. Stender has a dam breach study for Wolf Creek Dam. The EAP is currently being updated along with the Dam Breach Study.
- Mr. Keltyka confirmed that Lake Dorothy and Columbia Lake Dams currently have EAPs. The Firestone Dam was also mentioned as a concern.
- The Severe Storm Analysis will be aggregate the damages to just reflect Barberton's Risk. The ratio of Barberton buildings to Summit County buildings will be used. Mr. Pooler added that the City of Barberton contains about 5% of the total buildings within the county.
- The Snider Ave. Pump Lift Station will be added to the list of Critical Facilities at risk of flooding. Mr. Keltyka confirmed that the High School was built above the 100-year flood elevation.
- Attendees could not recall any Tornadoes within Barberton.
- Mr. Menninger discussed the Draft Hazard Prioritization and how the plan requires local input. The attendees will review the prioritization and provide

feedback.

- Ms. Whitehead then discussed the mitigation options and actions. FEMA's Mitigation Ideas handbook was provided to the attendees to develop Mitigation Ideas for each hazard. The mitigation worksheet was also provided.

- Mr. Stefan and Mr. Keltyka discussed 500 homes have been removed/bought out in a ten year time period. The city and Summit County have their own Land Banks. The funds for a majority of these buy-outs came from the Project Impact and NSP.

- The city is working with multiple jurisdictions / organizations to provide regional floodplain management programs. The city is working with Norton and Copley townships as well as the MWCD.

- The city is currently working with Ms. Coburn on a buy-out for her house, due to the multiple flooding occurrences within her house. Ms. Coburn and Mr. Griffin discussed their own flooding concerns. Both have been impacted directly by the flooding issues, as well as submitted claims through the NFIP.

Next Steps

The city will continue to gather mitigation ideas and data resources. Stantec will use the information provided to complete the Risk Analysis. The next meeting will focus on Mitigation Actions and strategies, which will probably take place in January 2014.

The meeting adjourned at 9:00 PM
The foregoing is considered to be a true and accurate record of all items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

STANTEC CONSULTING SERVICES INC.

John Menninger
Project Manager
John.Menninger@stantec.com

CITY OF BARBERTON MULTI - HAZARD MITIGATION PLAN

Mitigation Strategy

November 13, 2013

Community Name/Department _____ **Contact Name** _____ **Contact Phone No.** _____

Mitigation Goals:

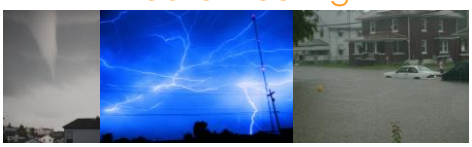
1. **Preventative Activities**. Reduce risks through regulations including building codes, development outside of hazardous areas, and local planning or capital improvement projects.
2. **Property Protection**. Reduce exposure to hazards through building or parcel specific activities such as flood proofing, structure acquisition, or retrofitting.
3. **Emergency Services**. Reduce impacts through response and recovery activities that are implemented during a disaster.
4. **Structural Projects**. Minimize impacts through projects, such as detention basins, tornado shelters, tornado sirens, etc.
5. **Public Information**. Assist residents to prepare for risks and protective measures to better protect themselves and their property.

Item Number	Goal Number	Mitigation Action	Responsible Agency & Contact Person	Funding Source	Implementation Timeline	Estimated Benefits†	Estimated Costs†
Example	*2*	*Purchase homes in the 100 year floodplain and convert the space to a park*	*County Planning Department – Bob Jones, Director*	*HMGP & General Funds*	*5 years*	*Medium*	*Medium*
1.							
2.							
3.							
4.							
5.							

† **Rank Each Mitigation Action Higher = 1 Lower = 5**

†† **Benefit and Cost estimates should be based on these categories**:
Less than $100,000 = Low
$100,000 - $500,000 = Medium
More than $500,000 = High

City of Barberton Multi-Hazard Mitigation Plan Risk Vulnerability - Public Meeting



November 2013

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Introductions

Alan Keltyka – Planning Lead Director
Floodplain Administrator – Stormwater Utility Manager -
AKeltyka@cityofbarberton.com

John Menninger, PE – Consultant
Stantec Consulting Services, Inc.
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emily.whitehead@stantec.com

Adam Pooler, GISP – Consultant
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adam.pooler@stantec.com

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Meeting Agenda

Outline

1. Introductions
2. Plan and Meeting Goals
3. Hazard Mitigation Plan - Overview
4. Risk Analysis Overview
5. Hazard Profiles
6. Vulnerability Rankings
7. Mitigation Project Development

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Hazard Mitigation Plan - Goals

Hazard Mitigation Plan Goal

1. Protect lives and property through identification of City of Barberton specific hazards and development of sound mitigation projects
2. Allows for Federal funding for mitigation projects.

Today's Meeting Goal

1. Review Hazard Profiles and Initial Vulnerability Rankings
2. Begin Development of Mitigation Actions

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Hazard Mitigation Plan - Overview

Primary Elements

1. Planning
2. Risk Assessment
3. Mitigation Strategies
4. Plan Review and Adoption
5. Plan Maintenance

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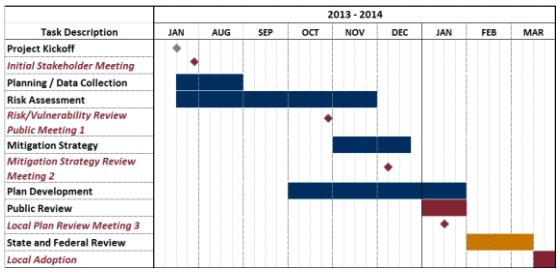
Hazard Mitigation Plan - Schedule



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Hazard Risk Analysis

Hazards of Concern

1. Flooding
2. Severe Thunderstorms
3. Sinkholes / Subsidence
4. Dam / Levee Failure
5. Tornadoes
6. Severe Winter Storms
7. Earthquakes

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Hazard Risk Analysis

Methodology

1. Calculate Event Probabilities
2. Determine Potential Impacts
   - Economic Damage, Population, Critical Facilities
3. Calculate Risks / Vulnerabilities

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Hazard Risk Analysis

Data Sources

1. FEMA's HAZUS-MH
   - Flooding and Earthquakes
2. Historic Events
   - Tornadoes, Severe Storms, Extreme Temperatures
3. Additional Studies
   - ODNR Mine Subsidence Study
4. Qualitative Assessments
   - Dam Failure

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Critical Facilities

Critical Facility Types

1. Emergency – Police, Fire, Emergency Operations Center, Warning Sirens
2. Medical – Hospitals, Ambulance Companies, Extended Care / Nursing
3. Schools
4. Utility Locations – Storm, Sanitary, Drinking Water, Electric, Natural Gas
5. Transportation – Bridges, Airports, Heliports

Community	Critical Facilities				Transportation		Utilities				
	Schools	Police Station	Fire Stations	Medical / Nursing Facilities	Bridge	Dams	Water Treatment Plants	Water Sources	Wastewater Treatment Plants / Facilities (Pump Stations)	Community Facilities / Government	Total
CITY OF BARBERTON	10	1	2	2	23	1	1	1	2	1	44
NORTON TOWNSHIP	4					1					5
COVENTRY TOWNSHIP											0
CITY OF AKRON	2										2
TOTAL	16	1	2	2	23	2	1	1	2	1	51

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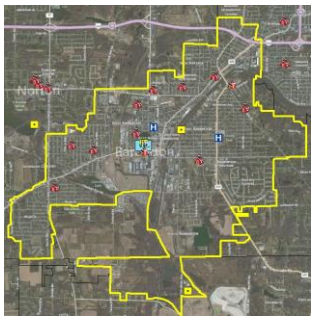
Critical Facilities



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Hazard Risk Analysis

Population & Structural Vulnerability – City-wide

2010 Census Population – 26,550 / 742 Census Blocks
Population in Floodplain - 4,889 / 156 Census Blocks

Structural Vulnerability by Type for the Entire City

	Residential		Commercial		Industrial		Religion/Government/Education = Exempt PUC; Unknown PUC; or Other PUC		Agricultural		Total	
Community	Number	Value ($)*	Number	Value ($)*	Number	Value ($)*	Number	Value ($)*	Number	Value ($)*	Number	Value ($)*
City of Barberton	15,622	514,500,700	998	91,143,720	366	35,363,460	520	112,973,370	37	339,540	17,543	754,320,790
Total	15,622	514,500,700	998	91,143,720	366	35,363,460	520	112,973,370	37	339,540	17,543	754,320,790

*Value taken from Assessors building values. Value based on Parcel, which meant multiple structures with the same Parcel Number were not duplicated within the table.
Total Structures within/adjacent to Barberton is 17,543

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Hazard Risk Analysis – Flooding

Summary of Events & Future Probability

- 46 Events from 1994 -2013 –Summit County
  - Damages: $161,149,480
  - Life Loss: 4
  - Injuries: 0
- 7/10/2013 – $15 Million in Barberton (NOAA)
- Annual Chance of Occurrence = 100%
- FEMA NFIP – $1,008,370.46 Losses Paid
  - 116 Claims
- HAZUS-MH: City of Barberton
  - Average Annualized Loss: $5,847,000

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Hazard Risk Analysis – Flooding

Streams Affecting Barberton

- Hudson Run
  - July 2013 – 500 year event
- Mud Run
  - July 2013 – 50 year event
- Pancake Creek
- Tuscarawas River
  - July 2013 – 100 year event
- Wolf Creek
  - July 2013 – 100 year event

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Hazard Risk Analysis – Flooding

Area of Barberton Flooding

- *FLOOD ZONE*
  - *14TH, 15TH, & 16TH STREETS NW*
  - *SOUTH BARBERTON*
  - *31st STREET – HUDSON RUN*
  - *MUD RUN – COVENTRY ROAD - EAGON STREET*
  - *ROBINSON AVE. – EAST TUSCARAWAS AVE.*
  - *2nd STREET SE – LAMBERTON AVE.*
- *NON-FLOOD ZONE*
  - 17TH ST. NW
  - AREA EAST OF 5TH ST. NE
  - 19TH AND 21ST STS. NW
  - VAN- HYNING NEIGHBORHOOD
  - ORCHARD STREET AND EVERGREEN AVE

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Hazard Risk Analysis – Flooding

Area of Barberton Flooding - *14TH, 15TH, 16TH 17TH, 19TH & 21ST STREETS NW*

- Historical flooding.
- Lower living levels and streets.
- Greatest potential for assistance.

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Hazard Risk Analysis – Flooding

SOUTH BARBERTON FLOOD ZONE - Tuscarawas River

- Historical flooding.
- Lower living levels and streets.
- Sewage backups

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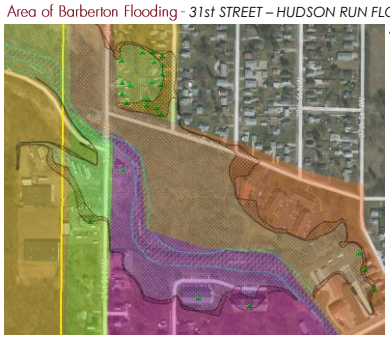
Hazard Risk Analysis – Flooding

Area of Barberton Flooding - *31st STREET – HUDSON RUN FLOOD ZONE*



- Single-family and apartment structures at-risk.

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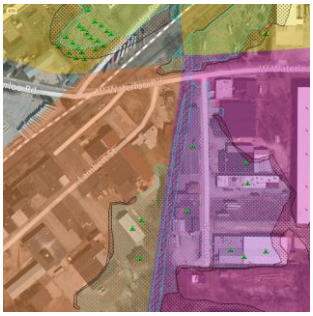
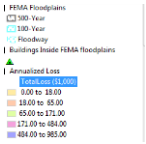
Hazard Risk Analysis – Flooding

Area of Barberton Flooding - *MUD RUN – COVENTRY ROAD - EAGON STREET FLOOD ZONE*



- Commercial & Industrial structures at-risk.
- Few older residential structures



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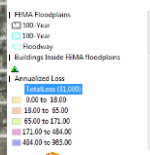
Hazard Risk Analysis – Flooding

Area of Barberton Flooding - *ROBINSON AVE. – EAST TUSCARAWAS AVE. FLOOD ZONE*

- 2007 & 2011 flood events
- Stormwater Retention Pond storage problems



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Hazard Risk Analysis – Flooding

- Area of Barberton Flooding - *2nd STREET SE – LAMBERTON AVE. FLOOD ZONE*

- 2007 flood events
- Single family homes and apartment complexes suffered damages.

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Hazard Risk Analysis – Flooding

- Area of Barberton Flooding - 17TH ST. NW

- Runoff from Norton Ave. flows south on 17th St. NW.
- Inadequate existing Stormwater sewer system.
- Increasing runoff storage is essential.

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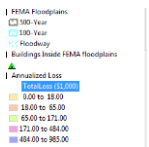
Hazard Risk Analysis – Flooding

- Area of Barberton Flooding - AREA EAST OF 5TH ST. NE

- Neighborhoods experiencing stormwater accumulation in yards – exceeding 2 ft.



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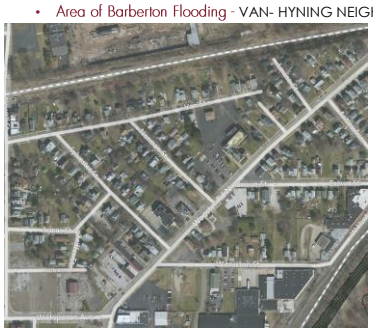
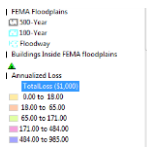
Hazard Risk Analysis – Flooding

- Area of Barberton Flooding - VAN- HYNING NEIGHBORHOOD



- Moderate to heavy rain events result in stormwater overtopping curbs.



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Hazard Risk Analysis – Flooding

- Area of Barberton Flooding - ORCHARD STREET AND EVERGREEN AVE

- Natural basin at intersection overwhelms existing stormwater infrastructure.

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Critical Facilities – At Risk of Flooding

Critical Facilities

1. School – Barberton High School
2. Bridges – 23
3. Sanitary Treatment Plant – 1

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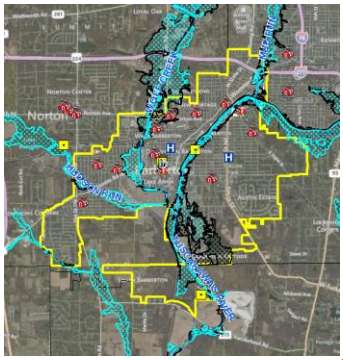

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Hazard Risk Analysis – Severe Storms

Summary of Events & Future Probability

- 304 Events from 1955 – 2012 Summit County (NOAA)
  - Damages: $119,255,000
  - Life Loss: 1 – Due to Lightning
  - Injuries: 12
- Annual Chance of Occurrence = 100%
- Annualized Risk
  - Damages: $2,056,120.69
  - Life Loss: 0.02
  - Injuries: 0.21

Ind. Annual Probabilities	
Hail:	100%
Wind:	100%
Lightning:	19%

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Hazard Risk Analysis – Sinkholes / Coal Mining / Mine Subsidence

Summary of Events & Future Probability

Source: ODNR Report March 2003

- 69 Parcels Studied – 36 Buildings assessed
- Subsidence Risk identified along Hagey Drive, Harden Drive, Alcorn Drive, 33rd Street, 35th Street, and 37th Street
- Multiple ODNR borings with full height void and some state of roof collapse.

Future Probability: Unknown

Vulnerability: 36 Buildings – $3,020,300

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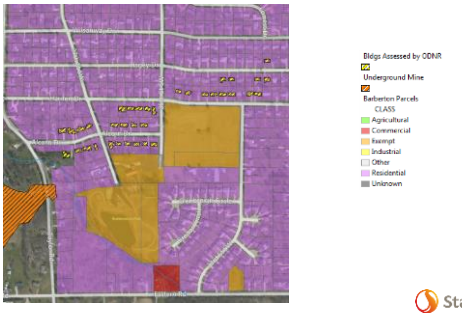
Hazard Risk Analysis – Sinkholes / Coal Mining / Mine Subsidence

Underground Mining Potential Impact



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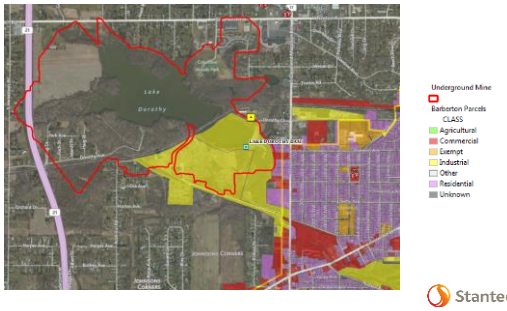
Hazard Risk Analysis – Sinkholes / Coal Mining / Mine Subsidence

Underground Mining Potential Impact – Lake Dorothy



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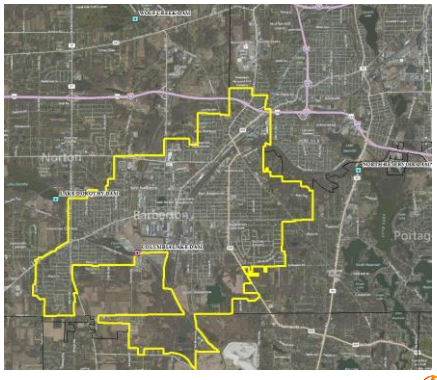

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Hazard Risk Analysis – Dam / Levee Failure

Summary of Events & Future Probability

- Local Dams of Concern
  - Lake Dorothy
  - Columbia Lake
  - Wolf Creek
  - North Reservoir Dam
- No Historical Record
- Dam and Levee Breach Analyses: Unknown
- Probability of Occurrence: Low
- Potential Impacts:
  - Damage to Critical Infrastructure
    - Downstream Bridges
    - Inundation Downstream
    - Loss of Water Source

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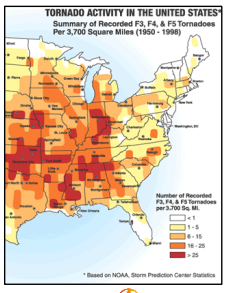
Hazard Risk Analysis – Tornadoes

Summary of Events & Future Probability

- 16 Events from 1963 -2013 (Summit County)
  - Damages: $19,504,500
  - Life Loss: 0
  - Injuries: 1
- Barberton Annual Chance of Occurrence = 7%
- Annualized Risk
  - Damages: $482,612
  - Life Loss: 0
  - Injuries: 0.02



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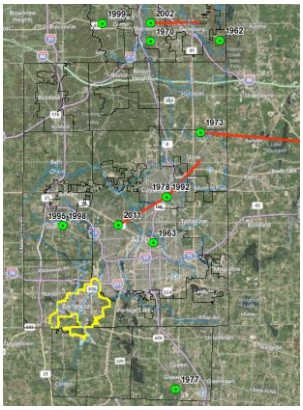

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Hazard Risk Analysis – Severe Winter Storms

Summary of Events & Future Probability

- *56 Events from 1993 – 2009
  - Damages: $201,968,000
  - Life Loss: 15
  - Injuries: 77
- Annual Chance of Occurrence = 100%
- *Annualized Risk
  - Damages: $11,880,470.59
  - Life Loss: 0.79
  - Injuries: 4.05
- Annualized Risk Barberton: $594,023

*Statewide or Regional Events

*Ind. Annual Probabilities	
Heavy Snow:	100%
Extreme Cold:	35%
Blizzard:	6%

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Hazard Risk Analysis – Earthquakes

Summary of Events & Future Probability

- *4 Events from 1885 – 2010 (Summit County)
  - Damages: Unknown
  - Life Loss: Unknown
  - Injuries: Unknown
- Annual Chance of Occurrence = Minimal
- HAZUS-MH Annualized Risk (Barberton)
  - Damages: $100,968
- *Source: Ohio Department of Natural Resources

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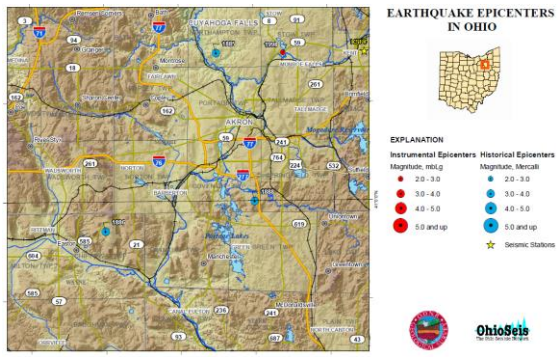

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Hazard Risk Analysis – Prioritization

Probability	
Low (1)	<1% - 20% chance of occurrence per year
Medium (2)	21% - 100% chance of occurrence per year
High (3)	Excellent chance of more than one occurrence per year

Vulnerability	
Low (1)	Less than 10% of the total population of the jurisdiction
Medium (2)	10% to 25% of the total population of the jurisdiction
High (3)	More than 25% of the total population of the jurisdiction

Severity of Impact	
Low (1)	Minor injuries (under 50) & property damage (under $1,000,000), or less than 24 hour shutdown of essential facilities
Medium (2)	Serious injury (more than 50), major property damage (structural stability) ($1,000,001 to $15,000,000), or 24 to 72 hour shutdown of essential facilities
High (3)	Multiple deaths (more than 5), property destroyed or damaged beyond repair (more than $15,000,000), or more than 3 days of shutdown for essential facilities

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Hazard Risk Analysis – Prioritization

City of Barberton				
Hazard	Probability	Vulnerability	Severity of Impact	Total
Flooding	2	3	3	8
Severe Storms*	3	2	2	7
Sinkholes / Subsidence	1	2	1	4
Dam/Levee Failure	1	2	3	6
Tornadoes	1	1	2	4
Winter Storms*	3	2	1	6
Earthquakes*	1	1	1	3
* Countywide or Regional Events				

Low	3
Guarded	4
Elevated	5-6
High	7-8
Severe	9

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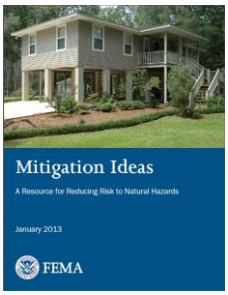
Mitigation Project Development

Mitigation Actions

1. Local Plans and Regulations
2. Community Identified Programs
3. Structure and Infrastructure Projects



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Local Plans and Regulations

Open Space Preservation
Zoning
Building Codes
Considering risk reduction across departments

- Comprehensive Plans
- Master Plans

Community Identified Program

- Funding Mechanisms (e.g. stormwater utility)
- Incentives for Local Risk Reduction
- Stream Maintenance Program

Structure and Infrastructure Projects

- Acquisition and Elevation
- Soil Stabilization and Erosion Control
- Retrofitting

Mitigation Project Development

Flood Mitigation Activities Currently Identified by the Stormwater & Floodplain Administration Department

1. Remove flood prone structures from the area.
2. Flood Proof Structures in the Flood Plain
3. Install Structural Flood Control
4. Reduce Stormwater Entering multiple streams
5. Increase Storage Capacity (multiple streams)

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Mitigation Project Worksheet

CITY OF BARBERTON MULTI- HAZARD MITIGATION PLAN
Mitigation Strategy
November 13, 2013

Community Name _____ Contact Name _____ Contact Phone No. _____

Mitigation Goals:

1. **Preventative Activities**. Reduce risks through regulations including building codes, development outside of hazardous areas, and local planning or capital improvement projects.
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5. **Public Information**. Assist residents to prepare for risks and protective measures to better protect themselves and their property.

Item Number	Goal Number	Mitigation Action	Responsible Agency & Contact Person	Funding Source	Implementation Timeline	Estimated Benefits[1]	Estimated Costs[1]
Example	*2*	*Purchase homes in the 100 year floodplain and convert the space to a park*	*County Planning Department – Bob Jones, Director*	*HMGP & General Funds*	*5 years*	*Medium*	*Medium*
1.							
2.							
3.							
4.							
5.							

[1]Benefit and Cost estimates should be based on these categories:
Less than $100,000 = Low
$100,000 - $500,000 = Medium
More than $500,000 = High

Mitigation Activity Development Worksheet

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Next Steps

Community / Stakeholders

1. Review and Provide Input on Hazard Prioritization
2. Continue Development of Mitigation Goals

Planning Team

1. Complete Risk Analysis
2. Develop Mitigation Projects

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Questions

Alan Keltyka – Planning Lead Director
Floodplain Administrator – Stormwater Utility Manager -
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emily.whitehead@stantec.com

Adam Pooler, GISP – Consultant
Stantec Consulting Services, Inc.
adam.pooler@stantec.com

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Agency/Organizations	Department	Name	E-mail
City of Barberton	Mayor	William Judge	mayor@cityofbarberton.com
City of Barberton	City Council, President	Fred Maurer	fmaurer@cityofbarberton.com
City of Barberton	City Council, At-Large	Michael Soyars	msoyars@cityofbarberton.com
City of Barberton	City Council, At-Large	Carla Debevec	cdebevec@cityofbarberton.com
City of Barberton	City Council, 1st Ward	Gary Endres	gendres@cityofbarberton.com
City of Barberton	City Council, 2nd Ward	John Lysenko	jlysenko@cityofbarberton.com
City of Barberton	City Council, 3rd Ward	John Wagner	jwagner@cityofbarberton.com
City of Barberton	City Council, 4th Ward	Craig Megyes	cmegyes@cityofbarberton.com
City of Barberton	City Council, 5th Ward	Terry Avant	tavant@cityofbarberton.com
City of Barberton	City Council, 6th Ward	Carol Frey	cfrey@cityofbarberton.com
City of Barberton	Clerk of City Council	Renee Fox	rfox@cityofbarberton.com
City of Barberton	Service Director	Elwood Palmer	epalmer@cityofbarberton.com
City of Barberton	Safety Director	Michael Kimble	Mkimble@cityofbarberton.com
City of Barberton	Utilities Director	Jim Stender	jstender@cityofbarberton.com
City of Barberton	Building Commissioner	Jim Bauschlinger	Jbauschlinger@cityofbarberton.com
City of Barberton	Planning Director	Diane Sheridan	planning@cityofbarberton.com
City of Barberton	Assistant. Planning Director	Joe Stefan	jstefan@cityofbarberton.com
City of Barberton	Information Technology	Keith Whitton/Chris Stoll	Kwhitton@cityofbarberton.com/Cstoll@cityofbarberton.com
City of Barberton	Police Chief	Vince Morber	vmorber@cityofbarberton.com
City of Barberton	Fire Chief	Kim Baldwin	Kbaldwin@cityofbarberton.com
Summit Co.	Health Dept.	Gene Nixon. R.S., M.P.A.	gnixon@schd.org
Summit Co.	Emergency Management Agency	Valerie DeRose	vderose@summitoh.net
Summit Co.	Summit County Engineer	Alan Brubaker, P.E., P.S.	abrubaker@summitengineer.net
City of Akron	Director of Public Service	John Moore	Jmoore@akronOhio.gov
City of Norton	Mayor	Mike Zita	mayorzita@cityofnorton.org
City of Norton	Engineering	Dave White, P.E.	dwhite@summitengineer.net
Coventry Township	Zoning	George Beckham	zoning@coventrytownship.com
City of New Franklin	Mayor	Al Bollas	mayor@newfranklin.org
Ohio EMA	Mitigation Branch - Chief	Steve Ferryman	sferryman@dps.state.oh.us
Ohio EMA	Mitigation Branch	Rachael Evans	revans@dps.state.oh.us
Ohio Dept. Of Natural Resourses	Program Mgr, Floodplain Mgmt.	C. Thoms CFM	christopher.thoms@dnr.state.oh.us
PPG	Facilitiy Engineer	Mario Narbutaitis	mjnarbutaitis@ppg.com
Barberton Community Hospital	Facilitiy Engineer	Ricki Gerber	rickig@summahealth.org
Babcock & Wilcox	Facilitiy Engineer	Jim Smart	jssmart@babcock.com
American Red Cross	Summit & Portage Co.	Joseph Cavarett	joe.cavaretta@redcross.org
Copley Township	Trustee	Scott Dressler - President	sdressler@copley.oh.us
Copley Township	Trustee	Dale Panovich - VP	dpanovich@copley.oh.us
Copley Township	Trustee	Helen Humphrys	hhumphrys@copley.oh.us
Barberton Community Development Corp.	Director	Scott Wagner	scottwagner@bcdc.org
Barberton Community Foundation	Director	Larry Lallo	llallo@barbertoncf.org

BARBERTON FLOOD ACTION COMMITTEE			
	Citizen Member	Barbara J. Coburn	bjcoburn@ameritech.net
	Citizen Member	Sara Johnson	jnsjohnson@hotmail.com
	Citizen Member	Shorter Griffin	shortergriffin@hotmail.com
	Citizen Member	Dan Pelligrini	danpellegrini@yahoo.com
	Mayor	William Judge	mayor@cityofbarberton.com
	Service Director	Elwood Palmer	epalmer@cityofbarberton.com
	Planning Director	Diane Sheridan	planning@cityofbarberton.com
	Assistant Planning Director	Joe Stefan	jstefan@cityofbarberton.com
	Utilities Director	Jim Stender	jstender@cityofbarberton.com
	Stormwater/Floodplain Admin.	Alan Keltyka	akeltyka@cityofbarberton.com
	Police Dept.	Martin Eberhaart	meberhart@cityofbarberton.com
	Fire Dept.	Dave Conner	ryback@neo.rr.com
	Utilities Dept.	Bryce Kuhl	bkuhl@cityofbarberton.com
	Street Dept	Tom Pasternak	tpasternak@att.net
	Stormwater Manager	Caroline Knorr	cknorr@cityofbarberton.com

MULTI-HAZARD MITIGATION PLAN
INITIAL STAKEHOLDER &
RISK ASSESSMENT MEETING
PUBLIC MEETING
SIGN-IN SHEET

City of Barberton, Ohio
Barberton, OH
November 13, 2013
6:30 PM

PLEASE PRINT

Name	Street Address City, State, Zip	Affiliation	Phone Number	Email Address
1. Diane Sheridan	364 E. Baird Ave	C.O.B	848.6729	dsheridan@cityofbarberton.com
2. Valerie DeRose	175 S Main St #101 Akron 44308	Summit County Emergency Mgt	330 643-2558	vderose@summitoh.net
3. Brandon Davis	175 S Main St. #101 Akron, OH	SCEMA	330 643-2558	Bdavis@Summitoh.net
4. BARB COBURN	166 14TH ST BARBERTON		330-310-7346	bjcoburn@AMPRITECH.NET
5. SHORTER GRIFFIN	225 STANLEY Ave	FLOOD ACTION COMMITTEE	330-753-5414	GEEZEKJNS5@YAHOO.COM
6. ALAN KELTYKA		CoB	330-861-7299	akeltyka@cityofbarberton
7.				
8.				
9.				

	Name	Street Address	Affiliation	Phone Number	Email Address
10.	ELWOOD PALMER	961 MESA VERDE DR.	SERVICE DIRECTOR	848-6717	epalmer@cityofbarb.com
11.	JIM STENGER	576 W Park Ave	UTILITIES	848.6720	jstenger@cityofbarberton.com
12.	JOE STEFAN	576 W. PARK AVE	ASST PLANNING DIR.	848-6729	JSTEFAN@cityofbarberton.com
13.	CAROLINE KNORR	576 W. PARK AVE	STORMWATER MANAGER	861-7298	CKNORR@CITYOFBARBERTON
14.	DAVID CALDERONE	68 PORTAGE LAKES	COVENTRY TWP TRUSTEE	330 645 6753	calderone@coventrytownship.com
15.					
16.					
17.					
18.					
19.					
20.					
21.					
22.					
23.					
24.					

Agenda

City of Barberton Multi-Hazard Mitigation Plan

Draft Plan Review/Comment – Public Meeting
Barberton YMCA – 500 W. Hopocan Ave., Active Adult Center
Wednesday, February 11, 2015: 6:00 PM

1) **Introduction**

2) **Hazard Mitigation Plan Overview:**

- **Goal of Hazard Mitigation Plan:** Protect lives and property through identification of City specific hazards and development of hazard mitigation projects.
- **Meeting Purpose:** Introduce the Hazard Mitigation Planning process to local stakeholders and solicit input and feedback.

3) **Planning Process**

- Stakeholder Meetings
- Stakeholder Outreach

4) **Hazard Risk Assessment**

- Methodology and Data Sources
- Hazard Risk Assessment & Vulnerabilities
- Prioritization and Rankings
- Mitigation Project Development

5) **Next Steps Forward**

- Plan Review Comments
- Plan Adoption

MULTI-HAZARD MITIGATION PLAN
DRAFT PLAN REVIEW MEETING
PUBLIC MEETING
SIGN-IN SHEET

City of Barberton, Ohio
Barberton, OH
February 11, 2015
6:00 PM

PLEASE PRINT

Name	Street Address City, State, Zip	Affiliation	Phone Number	Email Address
1. CAROLINE KNORR	576 W. PARK BARBERTON OH 44203	CITY OF BARBERTON	330-861-7298	CKNORR@CITYOFBARBERTON.COM
2. JIM ROZELLE	7061 CORPORATE WAY CENTERVILLE, OH	STORM WATER ENG.	937 723 0802	Riverang@AOL.COM
3. JIM STENGER	BARBERTON	BARBERTON	330 848 6713	JSTENGER@CITYOFBARBERTON.COM
4. MICHAEL VINAY	576 W. PARK AVE, BARBERTON	CITY OF BARBERTON	330-848-6717	MVINAY@CITYOFBARBERTON.COM
5. JAMES WYE	241 ST NW.	BARBERTON	330-753-7829	JAMES WYE
6. DAVID DOBSON	11687 LEBANON RD CINTI	STANTEC		
7. Adam Pooler	11687 Lebanon Rd Cincinnati, OH	Stantec	513-842-8237	Adam.Pooler@stantec.com
8.				
9.				

Introductions

Adam Pooler, GISP - Consultant
Stantec Consulting Services, Inc.
adam.pooler@stantec.com

Michael Vinay – Plan Coordinator
City of Barberton - Director of Public Service
mvinay@cityofbarberton.com

Caroline Knorr – Floodplain & Stormwater Department
City of Barberton
cknorr@cityofbarberton.com

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Agenda

1. Introductions
2. Plan and Meeting Goals
3. Hazard Mitigation Plans
   - Planning Process
   - Hazard Risk Assessment
   - Mitigation Actions
4. Next Steps
5. Questions/Comments

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Hazard Mitigation Plan – Goals

Hazard Mitigation Plan Goal
- Protect lives and property through identification of City of Barberton's specific hazards and development of sound mitigation projects
- Allows for Federal funding for mitigation projects

Today's Meeting Goal
- Provide a summary of the Plan Update
- Solicit stakeholder / community feedback

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Hazard Mitigation Plan – Timeline

2012 - 2013- Planning Process - Flood Action Committee
January 2013 Initial *Planning Coordination*
Spring/Summer 2013 - Risk Analysis
Spring/Fall 2014 – Develop Mitigation Strategies
February 2015 – Draft Plan Posted for Public & Ohio EMA for Comment/Review
March 2015 – Adopt Plan

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Hazard Mitigation Plan – Overview

Plan Sections
1. Introduction
2. Planning Process
3. Hazard Risk Assessment
4. Mitigation Strategy
5. Plan Maintenance

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Planning Process

Stakeholder Meetings

1. Kickoff – 1/31/2013
2. Risk Vulnerability – Public Meeting – 11/13/2013
3. Draft Plan - Public Comment Meeting – Today

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Planning Process

Stakeholders Included:

1. Elected Officials
2. Government Administrators and Department Heads
3. Law Enforcement and Fire Departments
4. Flood Action Committee
5. Local Businesses
6. General Public

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Planning Process

Additional Stakeholder Outreach

1. Provided Updates to Plan Administrator
2. Notifications in Local Newspapers
3. Draft Plan Available on Website and at Local Library

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Hazard Risk Assessment

How Do You Quantify Risk?

1. Calculate Event Probabilities
2. Determine Potential Impacts
   - Economic Damage, Population, Critical Facilities
3. Calculate Risks / Vulnerabilities

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Hazard Risk Assessment

Hazard Prioritization

1. Flooding
2. Severe Storms
3. Subsidence
4. Dam/Levee Failure
5. Tornadoes
6. Winter Storms
7. Earthquakes
8. Hazardous Material Accidents

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Hazard Risk Assessment

Hazard Rankings

Hazard	Average Annualized Loss ($)	Probability	Vulnerability	Severity of Impact	Total
Flooding	5,847,000	2	3	2	7
***Severe Storm**	1,987,583	3	2	2	7
****Severe Winter Storm**	N/A	3	2	1	6
Subsidence	N/A	2	1	1	4
Dam/Levee Failure	N/A	1	2	1	4
***Tornadoes**	398,051	1	1	2	4
Earthquakes	42,896	1	1	1	3
Hazardous Materials	N/A	1	1	1	3
*County/Regional Events only					
**Statewide/Regional Events only					

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Mitigation Actions

Mitigation Project Types (Structural and Non-Structural)

1. Preparedness
2. Prevention
3. Resilience
4. Recovery

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Mitigation Actions

Flooding

Numerous Mitigation Actions developed located in Appendix D

1. Create a Flood Conservancy District
2. Structural mitigation – Acquisition or flood proofing for repetitive loss structures
3. Construct Additional Storm Sewers, Flood Control Structures, Flood Storage

16TH St. NW – August 20, 2007

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Mitigation Actions

Flood Mitigation Strategies

Flood Risk & Vulnerability Assessment (2013)

1. Improve data collection pertaining to flood loss and quantify losses.
2. Develop an official Flood Risk and Vulnerability Assessment for the City of Barberton.
3. Continually review and update emergency response and flood mitigation SOP's
4. Review and update policies, procedures, and local ordinances.

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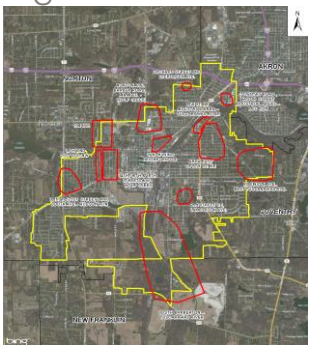
Mitigation Actions



Flood Mitigation Strategies Areas of Flooding – Appendix G

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Mitigation Actions

Severe Storms

1. Public Notification System for Closures/Safety Warnings
2. Maintain Road Circulation
3. Inventory shelters
4. Assess Essential Facilities
5. Inform Residents on Emergency Notification systems

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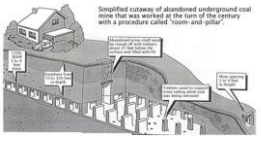
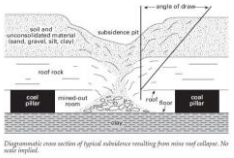
Mitigation Actions

Subsidence

1. Identify areas of subsidence and limit future development
2. Properly identify historic mining locations in Southwest and East Barberton, while implementing the Mine Stabilization Program by ODNR





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Mitigation Actions

Dam Failure

1. Encourage development of Emergency Action Plans for all dams
2. Public outreach / education regarding downstream risks

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Mitigation Actions

Tornadoes

1. Replace / install emergency sirens
2. Inventory shelters
3. Assess Essential Facilities
4. Inform Residents on Emergency Notification systems

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Mitigation Actions

Winter Storms

1. Public Notification System for Weather Warnings
2. Ice Jams – Inspection of Potential Locations
3. Assess Essential Facilities & Shelters
4. Inform Residents on Emergency Notification systems

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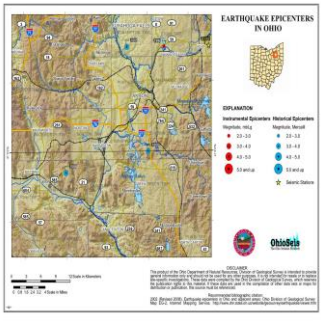
Mitigation Actions

Earthquakes

1. Education and outreach for preparedness
2. Prepare Contingency Plan for Alternate Locations of Critical Facilities



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Mitigation Actions

Hazardous Material Accidents

1. Coordinate with Summit County Emergency Management Agency
2. Monitor Hazardous Materials Sites
3. Public outreach / education regarding disposal of household hazardous materials

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Plan Maintenance

Key Activities

1. Annual Review
2. Incorporate New Plans
3. Revise Mitigation Strategies as Needed
4. Major Update Every 5 Years

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Next Steps

1. Public Comment Period Open until February 20th
   - Hard Copies Available at Local Library
   - Electronic Copy on Barberton Website
     - http://www.cityofbarberton.com/oc/project_nhmp.shtml
2. Plan Adoption following OEMA and FEMA Approval

Stantec

Questions?

Adam Pooler, GISP - Consultant
Stantec Consulting Services, Inc.
adam.pooler@stantec.com

John Menninger, PE – Consultant, Project Manager
Stantec Consulting Services, Inc.
john.menninger@stantec.com

Stantec

City of Barberton

Founded 1891

STORMWATER MANAGEMENT-FLOODPLAIN ADMINISTRATION

November 4, 2013

Barberton Community Development Corporation

Barberton, Ohio

scottwagner@bcdc.org

SUBJECT: BARBERTON NATURAL HAZARDS MITIGATION PLAN

The City of Barberton is preparing a Natural Hazards Mitigation Plan (NHMP) in conjunction with STANTEC Consultants. We will be holding an initial stakeholders meeting on Wednesday November 13, 2013 at 6:30 PM at the Active Adult Center, 500 W. Hopocan Ave. in Barberton.

We would like to extend an invitation to join us in this meeting for soliciting input and feedback from interested parties on area natural disasters and potential mitigations in our area.

The Natural Hazards Mitigation Plan can assist Barberton and its neighbors in understanding what natural events can put our communities at risk. Developing a Natural Hazards Mitigation Plan is an effort to reduce future loss of life and property from natural disasters by recognizing these events and their effects on the community and implementing mitigation projects. We would like to extend an invitation to join us in this meeting for soliciting input and feedback.

A FEMA approved Natural Hazards Mitigation Plan is necessary for Barberton to apply for Pre-Disaster Mitigation and Flood Mitigation Grants.

Respectfully,

Alan Keltyka, P.E.
Stormwater & Floodplain Administrator
akeltyka@cityofbarberton.com
330-861-7299

From: Alan Keltyka
Sent: Wednesday, October 23, 2013 11:35 AM
To: William Judge; Elwood Palmer; Jim Bauschlinger; Jim Stender; Diane Sheridan; Joseph Stefan; Vince Morber; Kim Baldwin; Caroline Knorr
Subject: Barberton NATURAL HAZARDS MITIGATION PLAN Meeting

On Wednesday November 13, 2013, our NATURAL HAZARDS MITIGATION PLAN Consultant will be holding a stakeholder presentation as part of the requirement for FEMA Approval. At the present, the time and location of the presentation are undetermined. We will inform you as the schedule becomes finalized.

Thanks, Alan

From: Alan Keltyka
Sent: Monday, November 04, 2013 10:05 AM
To: William Judge; Elwood Palmer; Michael Kimble; Vince Morber; Kim Baldwin; Diane Sheridan; Joseph Stefan; Jim Bauschlinger; Jim Stender; Chris Stoll
Cc: Fred Maurer; Carla Debevec; Michael Soyars; Gary Endres; John Lysenko; John Wagner; Craig Megyes; Terry Avant; Carol Frey
Subject: Natural Hazard Mitigation Meeting-City
Attachments: NHMP City Inv.pdf

Please See Attached

From: Alan Keltyka
Sent: Wednesday, November 06, 2013 7:40 AM
To: ' Dan Pelligrini'; 'Barbara J. Coburn'; Bryce Kuhl; 'Dave Conner'; Diane Sheridan; Elwood Palmer; Jim Bauschlinger; Jim Stender; Joseph Stefan; 'Kathleen Reed'; Marta Savula; Martin Eberhart; 'Sara Johnson'; 'Shorter Griffin'; William Judge
Subject: Barberton Natural Hazards Mitigation Plan Meeting
Attachments: BFAC Invite Stakeholders Mtg.doc

Please see attached

Flooding topic at Council

Rich Muller
Herald Staff Writer

Barberton City Council's recent appropriation of $90,000 from the stormwater management fund to purchase 898 Robinson Avenue home is just one project the city is working on as part of an effort to reduce stormwater runoff and flooding.

Stormwater engineer Alan Keltyka said the Robinson Avenue purchase was not planned but came about when the son of the owner, who had passed away, asked if the city was interested in purchasing the home. It sits immediately east of a silted-in retention pond that has overflowed twice in four years. Keltyka said the overflows caused significant damage to a number of homes in the area.

Keltyka said the city is evaluating a number of options as to what to do with the pond. One is to expand and dredge the pond, but Keltyka would like to see standing water eliminated and turn it into a meandering stream which could become a retention basin if needed.

Purchasing properties affected by flooding is not restricted to one area. Council is expected to vote on purchasing 359 Bell St. for future stormwater retention activities for $8,500 plus closing costs, using Community Development Block Grant funds. Properties along 14th and 15th streets are also under consideration for buy-outs.

"A lot of that depends on funding," Keltyka said.

"We are looking at purchasing some properties that are prone to flooding and also diverting some of the water into a variety of different holding areas," he said.

According to Keltyka, there is not a lot which can be done to reduce flooding in the area of 14th, 15th and nearby streets without a lot of extensive work. One thing the city can do is clean out gravel and debris washed into a retention area in the Foundation Sports Complex from Wolf Creek during recent flooding. It's a small fix, however, since the area is affected any time the creek rises.

Keltyka has presented six pages of proposed stormwater projects to Mayor Bill Judge to determine priorities and how much money is available. Keltyka anticipates a stormwater budget of approximately $800,000. About 40 percent of that goes to capital improvements. Of the rest, $350,000 pays for four full-time workers, seasonal workers, his salary and hopefully some interns. $250,000 pays for operations including repairs and vehicle maintenance.

Brushes for the city's street sweeper, which is paid for by the stormwater fund, cost from $2,000 to $2,500 each time they need to be repaired, which is about every four months. The fund will pay for a new backhoe, which will replace a 1996 model which replaced a 1978 one.

Disposal of street sweepings cost about $1,000 for a large truck load. Street sweepings, while not considered hazardous waste, require they go to special landfills. Stormwater funds also pay for leaf removal.

Keltyka stressed that for the larger projects, the city needs grants and funding which the stormwater fund cannot cover.

"We have no shortage of areas," Keltyka said.

Herald Newspaper - Flooding Council – March 08, 2012

Committee looks for ways to alleviate flooding

Rich Muller
Herald Staff Writer

The fourth meeting of Barberton Mayor Bill Judge's Flood Action Committee concentrated finding better ways to notify residents before and after an emergency of what programs there are for assistance.

Committee member and Assistant Planning Director Joe Stefan presented a draft packet of information to be handed out to residents, including phone numbers and a standard application form. He said they want to keep the packet as simple as possible for people who are experiencing a crisis.

"We wanted to keep it nice and simple so that, if the city can pull together a program, we wanted to be able to get assistance to them as quickly as possible, so that's our goal," Stefan said at Saturday's meeting.

The committee plans neighborhood meetings to include notification methods, how to be prepared before an emergency and what can be done during and after. The first meeting will be sometime mid-summer for the South Barberton area, followed by the 14th Street area in mid- to early-fall.

"We are looking at ways to mitigate flooding in town and what to do when a flood does happen because we can't stop all flooding, we know that," Judge said at Council member Craig Megyes 4th Ward meeting.

While its initial assignment deals with flooding, Judge still sees it becoming an emergency action committee.

Herald Newspaper - Flooding Council – April 26, 2012

The Barberton Herald

Find us on facebook
www.facebook.com/barbertonherald

50¢ Thursday, June 14, 2012

Alan Keltyka, the city's stormwater engineer and member of Mayor Bill Judge's flood action committee, explains some of the ways flooding issues can be addressed.

Flood Information Booth at Barberton Summerfest June 9 and 10 2012

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The Barberton Herald

www.facebook.com/BarbertonHerald
www.twitter.com/BarbertonHerald

50¢ Thursday, August 23, 2012

The only news source for Barberton and Norton since 1923

www.barbertonherald.com

Plan to attend

The Community is invited to a Flood Action Committee meeting which will take place in South Barberton. The meeting will be Aug. 29, 6–7:30 p.m. at the Community Holiness Church, 299 Frank Street.

Citizens will be updated on the work the Flood Action Committee has been doing the last seven months. Key speakers will include Flood Action members, Mayor Judge, as well as presentations by the storm water engineer and director of utilities.

Herald

Mayor's Corner

Thursday, September 6, 2012

I'd like to thank everyone who attended the first public meeting of my Flood Action Committee. We provided much needed information to residents regarding flooding and being prepared for emergencies. We will continue to have public meetings throughout town to provide information and answer questions from residents.

ald

Publishing, Inc. ★

Thursday, September 6, 2012

Flood committee meets with residents

Rich Muller
Herald Staff Writer

In the first of a series of meetings planned by Mayor Bill Judge's Flood Action Committee, South Barberton residents did not hear any magic overnight plan to stop flooding in the city, but they did hear about what the committee has come up with so far.

"When I ran for this office I told you one of the things I was going to address was the

(See FLOOD, Page 12)

HERALD PHOTO/Rich Muller

Barberton Mayor Bill Judge explains some of what the Flood Action Committee has been working on since it was formed in January.

Flood

(Continued from Page 2)

flooding issue," Judge told the audience, Aug. 29, at the Community Holiness Church. "I'm a man of my word so I put together this flood action committee."

The committee has met monthly since January to look at ways to mitigate and deal with flooding issues, plus how the city responds to other potential major disasters. Members include city officials, the safety forces who respond when there is a problem, and residents from some of the areas most often flooded.

"The representatives on the task force have lived through floods, they know what their streets, their neighborhoods, consist of," Judge said.

Committee member Shorter Griffin has lived on Stanley Avenue for more than 60 years. "We have seen flooding, flooding and flooding," he said.

"We are working to come up with a solution," Griffin said, adding they meet every month to discuss different parts of the process, but it's not an easy task. It takes a lot of money, time and planning.

Assistant Planning Director Joe Stefan said the studies being conducted are not to be put on a shelf but are needed to get federal funds when flooding or some other disaster happens. "One thing is necessary for the other to happen," he said.

Police Officer Marty Eberhart said the city's current emergency operations plan needs updating for more efficient responses during and after an emergency.

"Rest assured, if something happens now, your safety forces will be able to get to you," Eberhart stressed.

City stormwater engineer Alan Keltyka said changes in FEMA (Federal Emergency Management Agency) flood plain maps since 1981 have increased the area considered to be in a flood zone. He also noted that every time someone builds on a flood plain, that reduces the storage capacity of that portion of land, which means the water has to go somewhere else.

"This part of Barberton, no matter where it rains in Barberton, it ends up here," Keltyka said of South Barberton.

Flood insurance is available to anybody, but it's not cheap, Keltyka stated. The National Flood Insurance Plan has more than 41,000 policies in the state. This insurance is required for federally backed mortgages.

City of Barberton
OFFICE OF THE
MAYOR
576 West Park Avenue, Barberton, Ohio 44203

August 20, 2012

Dear Property Owner,

At the start of my term I assembled a team of community members and staff to work on issues regarding flooding throughout the city. This group has been working diligently since the beginning of this year.

One of the key components identified by this group was better communication between residents, property owners and the City of Barberton, as well as others that would be able to assist it times of flood crisis. You are invited to attend this community meeting which will take place in your neighborhood. Our first meeting for residents of south Barberton will be held August 29, 2012 from 6 – 7:30 pm at the Community Holiness Church located at 299 Frank Street Barberton, Ohio 44203.

This meeting is scheduled to be an informative meeting. Key speakers will include Flood Action Committee members, myself, as well as presentations by the Storm Water Engineer and Director of Utilities. The Utility Department will also have equipment available to view.

Our hope is that the event will be very informative and you will leave with a new understanding of how the City is addressing this major issue.

Respectfully yours,

William Judge

Mayor,

City of Barberton

William B. Judge, Mayor

576 West Park Avenue • Barberton, Ohio 44203
Phone: 330-848-6719 • Fax: 330-848-6663

FLOOD ACTION COMMITTEE PUBLIC MEETING

AGENDA

Date & Time:	**August 29, 2012**
	6 – 7:30 pm
Location:	**Community Holiness Church**
	299 Frank Street Barberton, Ohio.
6-6:05	Joe Stefan
	(Program Overview)
6:05-6:20	Mayor Judge
	(Welcome)
6:20-6:30	Committee Members
	(What Committee has done since January)
6:30-6:45	Marty Eberhardt
	(Emergency Management –Will be on Duty)
6:45-7:00	Alan Keltyka
	(Storm Water)
7:00-7:15	Jim Stender
	(Sewer Back Up)
7:15-7:30	Questions from Cards
7:30	Meeting Adjourned

Jet truck will arrive at approximately 5:30pm in parking lot

FALL HOME IMPROVEMENT • PAGES 1 • PAGES 23-26

INSIDE

The Barberton Herald

Got a smartphone? SCAN ME!

50¢ Thursday, September 19, 2013

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Fallen heroes honored

Firefighters and the public gathered outside the main Barberton fire station to remember the victims of the 9-11 terrorist attacks.

"On Sept. 11, 2001, firefighters, police officers, paramedics and our fellow countrymen were the first to become engaged in a war unlike any other our nation has ever seen." said Firefighter/Paramedic David Conner of the Barberton Fire Department. "They also became the first casualties in that war."

"Thousands of brave men and women have paid the ultimate sacrifice for our nation, for all of us standing here today," Conner said. "Thousands more bear the scars of war, both physical and emotional."

Conner asked to remember not only those who perished 12 years ago but also the veterans and families who have sacrificed and given so much to this great nation. To the veterans who have served and are still serving, he said, "we the firefighters of the Barberton Fire Department honor and salute you."

The ceremony included the traditional sounding of the fire bell, three rings, three times each, followed by one ring, to signify firefighters who have died in the line of duty.

HERALD PHOTO/Rich Muller

Barberton firefighters pay tribute to the 9-11-2001 terrorist attacks and to all firefighters who died in the line of duty.

HERALD PHOTO/Rich Muller

Mary Zinkovich shows she had not forgotten those killed in the 2001 terrorist attacks.

Magics accept!

Randy Broadwater
Herald Sports Writer

Barberton Athletic Director Rob Culbertson announced that the Magics "have accepted an invitation to join the Suburban League."

Barberton's announcement comes on the heels of Kent Roosevelt's announcement that they too have accepted the invite a couple of days prior. North Royalton has also accepted.

With Green's departure to the Federal League, the league is hoping to expand to a two-tier big school, small school format. Barberton would most likely end up in the small school division.

The deal would depend on the league's ability to attract enough teams to support two divisions.

Barberton was a member of the Suburban League from 2005-2011 and has been playing an independent schedule since their departure.

The Suburban League was formed in 1949 with Copley, Green, Hudson, Manchester and Northfield as its charter members. After Green's departure, members remaining will include Wadsworth, Nordonia, Highland, Tallmadge, Copley, Revere and Cloverleaf.

Other schools invited to join include Aurora, Brecksville, Cuyahoga Falls, Hudson, Stow and Twinsburg.

Ohio EPA orders Norton sewer fix

Carl Boon
Herald Staff Writer

Ohio EPA findings and orders regarding Norton's Nash Heights sewer problem were received Sept. 16 and reviewed by City Council at its work session that same evening.

The final findings confirm earlier ones of unsanitary conditions resulting from "the discharge of pollutants from inadequate or failing home sewage disposal systems." Testing done by the Summit County Health Department and the Ohio EPA have found "elevated levels of fecal coliform and E. Coli bacteria in violation of Ohio's water quality standards."

The EPA letter, addressed to Mayor Mike Zita and signed by EPA Director Scott J. Nally, gives the city 14 days to respond to agree to begin negotiation of the EPA's resolution orders. Failure to respond could result in the EPA referring the matter to the Ohio Attorney General.

(See SEWER, Page 2)

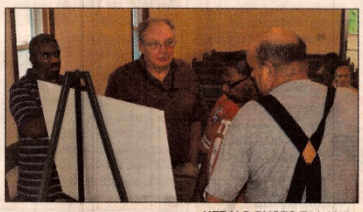
83,000 POWs/ MIAs will be remembered

The Ohio Veterans' Memorial Park will recognize POW/MIA Day with a dedication of the POW/MIA reflection pond, Saturday, Sept. 21, 4 p.m.

The Vietnam Veterans of American Chapter 717, the Veterans of Foreign Wars Post 3345, the American Legion Riders Post 221, the Perry High School ROTC along with guest speaker Vern A. Westfall will preside. Westfall was a USAF pilot in Vietnam. Growing up he remembers being allowed to mingle with captured German pilots in a World War II U.S. prisoner of war camp commanded by his father. Senator Frank LaRose, District 27 will also be speaking at the dedication.

Join to honor over 83,000 Americans who have paid a heavy price for freedom.

Basin will help South End flooding



HERALD PHOTO/Rich Muller

ABOVE: Stormwater Engineer Alan Keltyka explains the basin. RIGHT: A concept rendering gives a preview of what the stormwater storage basin will look like.

Rich Muller
Herald Staff Writer

Work begins on turning city owned property into a storm water basin.

Mayor Bill Judge and Storm water Engineer Alan Keltyka briefed residents Sept. 11 at the Community Holiness Church on what the project will include.

"It's not going to alleviate all the flooding," Judge said, "but it should hold about

(See BASIN, Page 2)

Night of goblins and goodies

Barberton and Norton city officials have asked residents to observe Halloween trick or treat Saturday, Oct. 26. In Barberton the hours are 5–8 p.m. In Norton it is 5–7 p.m. Turn on your porch light if you are passing out treats and leave the porch light off if not.

Norton Mayor Mike Zita notes that with trick or treating observed on the same day and time in all neighborhoods, safety personnel may concentrate efforts and resources to make a safe and happy Halloween celebration for all.

Sections:

Features:

Radio Shack robbed at gunpoint

HERALD PHOTO/Rich Muller

Radio Shack at Norton Plaza is a popular stop for many.

Police are investigating the armed robbery of the Norton Radio Shack.

A store clerk stated a black man wearing a black jacket and red shirt entered the store and looked at cellphones while the clerk was with another customer. The man then asked basic questions and after other customers had left said he would like a phone.

When the clerk went into the back room to unlock a cage where the phones were kept, the man burst through the door, brandished a firearm and ordered the clerk into the cage. He then ordered the clerk to fill a bag with cellphones before leaving through the back door and getting into a silver vehicle, possibly a Chrysler or Ford. There is no description of a second person who was waiting in the vehicle.

The robbery was reported at 7:49 p.m., Sept. 11. If you have any information contact Norton police at 330-706-0084, extension 128.

Officers now in every school

An agreement which will put police officers in the elementary schools was approved by the Barberton Board of Education.

The district and the Summit County Education Service Center have decided to keep officers Charles Kulig and Daniel Simpson at the schools from Aug. 26 to June 5.

"We're really excited now we have a Barberton police officer in every building in the district," Superintendent Patti Cleary said.

Norton board approves contract

Rich Muller
Herald Staff Writer

The Norton Board of Education approved a contract with the Ohio Association of Public School Employees (OAPSE) representing most of the district's non-teaching employees.

The three-year agreement approved at Monday's meeting calls for a 1 percent pay increase each year. It also increases the district's wellness plan contribution in an effort to control health care costs. The agreement, approved by OAPSE members Sept. 12 is in effect July 1 through June 30, 2016. The board also approved identical pay increases for the secretarial staff and administrators effective Aug. 1.

"It's nice to be able to have agreements now with both our teachers association and OAPSE that will get us through the next three years in a financially solvent position so thanks to them," Superintendent David Dunn said.

Sharon Herchik, director of curriculum and instruction, briefed the board on the district's state report card which gives letter grades instead of ratings.

The district earned grades of "A" for achievement indicators met, overall value-added and for students with disabilities and the percentage of students graduating in four years.

A concern is the Gap Closing in which the district received a "D" for meeting 69.6 percent goals called annual measurable objectives in reading, math and graduation. "What this does is give us our area of focus and this is where we're going to be working," Herchik said.

The fiscal year 2014 resolution was approved by the board. It calls for a general fund amount of $22 million.

FROM THE FRONT

Sewer

(Continued from Front Page)

The city has six months to submit a plan of correction. The orders further state, "The implementation of the schedule, including completion of construction and compliance with ORC (Ohio Revised Code) shall be achieved as soon as possible, but no longer than one (1) year from the date of Ohio EPA's approval of the general plan."

Related to the Nash Heights sewer problem, Council also discussed setting the date for a special election on a citizen-initiated charter amendment. The proposed amendment, submitted by William Paluch of Shellhart Road, would limit a resident's portion of sewer construction and tie-in costs to $5,000. A similar charter amendment, Issue 1, was defeated by voters in a special election Aug. 6. A special election will be required since the initiative was not submitted in time for the Nov. 5 general election.

Council discussed at length salary increases for non-union employees. Those employees have not received pay increases since 2008. Administrator Rick Ryland submitted suggested increases based on a survey conducted of similarly-sized cities. Council President Don Nicolard asked members to study the proposed increases and be prepared to vote at an upcoming meeting.

Council also agreed to vote at its next meeting for a resolution supporting the Mosquito Abatement District (MAD). That action came as a result of a letter from Summit County Council member Tim Crawford urging Norton to withdraw from MAD, a district comprised of Norton and Barberton. MAD representative Russ Shilling addressed Council, saying Norton's withdrawal would effectively end MAD.

Basin

(Continued from Front Page)

100,000 gallons so it will go there before it goes into the streets."

The basin at the southeast corner of Stanley and Bell is about $100,000 of the overall $800,000 project. Funding will come from city funds, including the storm water fee paid by residents.

Most of the money will go for what Keltyka describes as a full reconstruction of the roadway with 10-12 inches of asphalt on a new base with about 4,000 feet of sidewalks and curbing. On Stanley, the project will cover from S. Van Buren Avenue to Frank Avenue and for Bell Street from Stanley Avenue to Harold Street, Keltyka said.

Work is expected to begin within two weeks the mayor said. It is expected to take 35-40 days. Street reconstruction will not take place until next year.

The storage basin will be excavated out about 3 to 3 1/2 feet, moving about 500 yards of soil, Keltyka said.

"It is only intended to hold water for a short period of time," Keltyka said. "This will not be a permanent pool of any type here."

Harter Avenue resident Larry Eddings said he likes what he is hearing but right now it is just maps and surveys. He wants to see more projects to address flooding issues. Eddings, whose home has been flooded more than once, also said he should have been told about basement flooding when he built his house in 1976.

Keltyka said the city can recommend people do not build a basement, but cannot prohibit it. He also noted that until 2009 South Barberton was not considered a flood zone by the federal government.

"Where's the magic?" Eddings asked. "This is the Magic City where things are supposed to happen. We've got to get things to happen."

"This isn't going to solve the problem, but this is the first step," Judge stressed, "We're trying to be as proactive as possible."

ATTENTION RESIDENTS

Since becoming mayor, the City of Barberton has taken a pro-active approach to addressing flooding. Over the past 18 months, we have worked very hard setting up programs, committees and preparing studies to combat and help mitigate flooding in our city. The City of Barberton will host a special meeting concerning flooding and projects planned for Stanley Ave in 2013 and 2014.

Please join us for this important meeting:

Date: September 11th 2013

Time: 6:00pm

Location: 299 Frank Ave; Community Holiness Church

Topic: Flooding Mitigation and City Project for 2013 & 2014.

Brought to you by the City of Barberton & Flood Action Committee

Mayor William B. Judge

City of Barberton Multi-Hazard Mitigation Plan

Community Feedback Requested

Community involvement and feedback is vital for the success of the City of Barberton Multi-Hazard Mitigation Plan.

The Draft Plan is available at:

- **http://www.cityofbarberton.com/**
- **Barberton Public Library**
  - **602 W. Park Ave., Barberton, Ohio 44203**

The review and comment period will be open through February 13, 2015.

Comments can be submitted through the:

Feedback Survey https://www.surveymonkey.com/s/QK93RHC

Feedback Form (located at the Library)

Get Involved:

Read the Draft City of Barberton Multi-Hazard Mitigation Plan

Complete the feedback form or survey

Attend the Public Meeting on February 11, 2015 at 6:00 pm.

Location: City of Barberton Active Adult Center, Barberton YMCA

(500 W. Hopocan Avenue, Barberton, OH 44203)

City of Barberton Public Service & Floodplain/Stormwater Department
Michael Vinay, 330-848-6717, mvinay@cityofbarberton.com
Caroline Knorr, 330-861-7298, cknorr@cityofbarberton.com

Community Feedback Requested



Get Involved:

- Read the City of Barberton Multi-Hazard Mitigation Plan
- Complete the feedback survey
  Comments will be accepted through February 13, 2015



Sections 1 & 2: Introduction & Planning Process

1. Does these sections clearly outline the purpose and scope of the plan?

- ◯ Yes
- ◯ No

Comments

2. Does these sections clearly outline the planning process?

- ◯ Yes
- ◯ No

Comments

3. Was there sufficient Stakeholder involvement?

- ◯ Yes
- ◯ No

Other (please specify)

4. In your opinion, are the relevant planning documents included?

- ◯ Yes
- ◯ NO

Other (please specify)

Section 3: Hazard Risk Assessment

5. In your opinion, are the hazards of concern appropriate for the City?

- ◯ Yes
- ◯ No

Other (please specify)

6. Do the historical events listed represent the City's Risk?

- ◯ Yes
- ◯ No

Other (please specify)

7. In your opinion, are the hazard prioritization rankings appropriate for the City?

- ◯ Yes
- ◯ No
- ◯ Unsure

Other (please specify)

Sections 4 & 5: Mitigation Strategy and Plan Maintenance

8. Do you agree with the mitigation activities identified in the plan?

- ◯ Yes
- ◯ No
- ◯ Unsure

Other (please specify)

9. Are there additional mitigation activities that should be added?

- ◯ Yes
- ◯ No

Other (please specify)

10. Is the plan maintenance and update process sufficient?

- ◯ Yes
- ◯ No
- ◯ Unsure

Other (please specify)

Residents of the Barberton area are invited to review the plan and provide feedback. Comments can be submitted through the following:

- Electronic Survey - https://www.surveymonkey.com/s/QK93RHC
- Completing a feedback form at the Public Library - 602 W. Park Ave., Barberton, Ohio 44203 – The weeks of February 2 – 13.
- Public Service Department – Michael Vinay, 330-848-6717 mvinay@cityofbarberton.com
- Floodplain & Stormwater Department - Caroline Knorr, 330-861-7298 cknorr@cityofbarberton.com
- Attend the public forum on Wednesday, February 11th, 2015 at 6:00 PM
  - Barberton YMCA – 500 W Hopocan Ave, Active Adult Center
- Plan will be available for review and comment at the following website.
  - www.cityofbarberton.com
- The Plan will be available for comment between February 2, 2015 and February 13, 2015.

Mayor William B. Ju

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Multi-Hazard Mitigation Plan

City of Barberton has partnered with local governmental agencies/organizations to develop a Multi-Hazard Mitigation Plan.

The Multi-Hazard Mitigation Plan is required by 44 Code of Federal Regulations (CFR) Part 201.3 and the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Local jurisdictions are required to develop a plan in order to be eligible for pre-disaster and post-disaster mitigation grant programs.

The Multi-Hazard Mitigation Plan increases public awareness of local hazards and helps the City communicate local needs to state and federal officials when funding becomes available, particularly following a disaster.

Residents of the Barberton area are invited to review the plan and provide feedback. Comments can be submitted through the following:

- Electronic Survey
- Completing a feedback form at the Public Library - 602 W. Park Ave., Barberton, Ohio 44203 – The weeks of February 2 – 13.
- Public Service Department – Michael Vinay, 330-848-6717 or mvinay@cityofbarberton.com
- Floodplain & Stormwater Department – Caroline Knorr, 330-861-7298 or cknorr@cityofbarberton.com
- Attend the public forum on Wednesday, February 11th, 2015 at 6:00 PM at Barberton YMCA – 500 W Hopocan Ave, Active Adult Center
- The Plan will be available for comment between February 2, 2015 and February 13, 2015.

Full Flier

More Resources

Draft Plan

Online Survey

Feedback Form

Appendix C

Storm Events

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT		TSTM WIND	11-Jun-55	1506	65	0	0	0	0
SUMMIT		HAIL	21-Jun-55	1500	75	0	0	0	0
SUMMIT		TSTM WIND	21-Jan-59	0705	60	0	0	0	0
SUMMIT		HAIL	1-Jul-59	1520	175	0	0	0	0
SUMMIT		TSTM WIND	2-Jul-61	1400	0	0	0	0	0
SUMMIT		TORNADO	19-Apr-63	1520	0	0	0	2500000	0
SUMMIT		TORNADO	19-Apr-63	1520	0	0	0	2500000	0
SUMMIT		TORNADO	19-Apr-63	1520	0	0	0	2500000	0
SUMMIT		TSTM WIND	16-Mar-64	1800	51	0	0	0	0
SUMMIT		TSTM WIND	7-Aug-68	1000	0	0	0	0	0
SUMMIT		TORNADO	2-Apr-70	0825	0	0	0	2500	0
SUMMIT		HAIL	29-Jul-70	1320	100	0	0	0	0
SUMMIT		TSTM WIND	29-Jul-70	1320	60	0	0	0	0
SUMMIT		TSTM WIND	21-Aug-71	1500	0	0	0	0	0
SUMMIT		TORNADO	3-Jun-73	1700	0	0	0	25000	0
SUMMIT		TSTM WIND	3-Apr-74	2345	0	0	0	0	0
SUMMIT		TSTM WIND	14-Apr-74	1255	0	0	0	0	0
SUMMIT		TSTM WIND	2-Jun-75	1800	65	0	0	0	0
SUMMIT		TSTM WIND	3-Jul-75	1530	70	0	0	0	0
SUMMIT		TSTM WIND	24-Jul-75	1315	0	0	0	0	0
SUMMIT		HAIL	11-Jul-76	1344	175	0	0	0	0
SUMMIT		HAIL	11-Jul-76	1352	200	0	0	0	0
SUMMIT		HAIL	13-Aug-76	1700	75	0	0	0	0
SUMMIT		HAIL	13-Aug-76	1845	100	0	0	0	0
SUMMIT		TSTM WIND	30-Mar-77	1715	50	0	0	0	0
SUMMIT		HAIL	31-Jul-77	1540	75	0	0	0	0
SUMMIT		TSTM WIND	9-May-78	1555	0	0	0	0	0
SUMMIT		TORNADO	7-Jun-78	1615	0	0	0	2500000	0
SUMMIT		TSTM WIND	26-Jun-78	1205	50	0	0	0	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT		HAIL	27-Jul-78	1534	100	0	0	0	0
SUMMIT		HAIL	27-Jul-78	1628	100	0	0	0	0
SUMMIT		TSTM WIND	2-Jun-80	1115	52	0	0	0	0
SUMMIT		HAIL	11-Jul-80	1450	75	0	0	0	0
SUMMIT		HAIL	21-Jul-80	1400	100	0	0	0	0
SUMMIT		TSTM WIND	2-Aug-80	1601	54	0	0	0	0
SUMMIT		HAIL	28-Apr-81	1310	75	0	0	0	0
SUMMIT		HAIL	28-Apr-81	1830	100	0	0	0	0
SUMMIT		TSTM WIND	4-Jan-82	0812	52	0	0	0	0
SUMMIT		TSTM WIND	22-May-82	2245	0	0	0	0	0
SUMMIT		TSTM WIND	15-Jun-82	1830	0	0	0	0	0
SUMMIT		TSTM WIND	15-Jun-82	1845	0	0	0	0	0
SUMMIT		HAIL	2-May-83	1320	75	0	0	0	0
SUMMIT		TSTM WIND	3-Jul-83	1552	0	0	0	0	0
SUMMIT		TSTM WIND	4-Jul-83	1545	61	0	0	0	0
SUMMIT		TSTM WIND	4-Jul-83	1545	61	0	0	0	0
SUMMIT		HAIL	17-Jul-83	1420	75	0	0	0	0
SUMMIT		HAIL	21-Jul-83	1430	100	0	0	0	0
SUMMIT		TSTM WIND	21-Jul-83	1430	0	0	0	0	0
SUMMIT		HAIL	21-Jul-83	1500	150	0	0	0	0
SUMMIT		HAIL	21-Jul-83	1715	100	0	0	0	0
SUMMIT		TSTM WIND	21-Jul-83	1715	0	0	0	0	0
SUMMIT		TSTM WIND	6-Sep-83	1715	0	0	0	0	0
SUMMIT		TSTM WIND	10-Jul-84	1100	0	0	0	0	0
SUMMIT		HAIL	28-Mar-85	1817	75	0	0	0	0
SUMMIT		HAIL	28-Mar-85	2000	100	0	0	0	0
SUMMIT		HAIL	27-May-85	1349	75	0	0	0	0
SUMMIT		TSTM WIND	27-May-85	1415	0	0	0	0	0
SUMMIT		HAIL	27-May-85	1425	175	0	0	0	0
SUMMIT		HAIL	27-May-85	1435	125	0	0	0	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT		HAIL	27-May-85	1640	75	0	0	0	0
SUMMIT		HAIL	31-May-85	1608	175	0	0	0	0
SUMMIT		TSTM WIND	31-May-85	1620	0	0	0	0	0
SUMMIT		TSTM WIND	10-Mar-86	1805	0	0	0	0	0
SUMMIT		HAIL	6-May-86	1710	100	0	0	0	0
SUMMIT		TSTM WIND	15-Jun-86	1900	0	0	0	0	0
SUMMIT		TSTM WIND	16-Jun-86	1638	52	0	0	0	0
SUMMIT		HAIL	16-Jun-86	1658	75	0	0	0	0
SUMMIT		TSTM WIND	8-Jul-86	1425	55	0	0	0	0
SUMMIT		TSTM WIND	30-Sep-86	1430	0	0	0	0	0
SUMMIT		TSTM WIND	27-Apr-87	1540	0	0	0	0	0
SUMMIT		TSTM WIND	8-Jun-87	1615	0	0	0	0	0
SUMMIT		TSTM WIND	29-Jun-87	1345	0	0	0	0	0
SUMMIT		TSTM WIND	25-Jul-87	1440	0	0	0	0	0
SUMMIT		TSTM WIND	2-Aug-87	1907	0	0	0	0	0
SUMMIT		TSTM WIND	9-May-88	1600	0	0	0	0	0
SUMMIT		HAIL	15-May-88	1650	100	0	0	0	0
SUMMIT		HAIL	15-May-88	1715	150	0	0	0	0
SUMMIT		HAIL	2-Aug-88	1325	100	0	0	0	0
SUMMIT		TSTM WIND	5-Aug-88	1400	0	0	0	0	0
SUMMIT		TSTM WIND	25-May-89	2033	0	0	0	0	0
SUMMIT		TSTM WIND	1-Jun-89	1310	0	0	0	0	0
SUMMIT		TSTM WIND	4-Aug-89	1420	0	0	0	0	0
SUMMIT		TSTM WIND	3-Jun-90	1815	0	0	0	0	0
SUMMIT		TSTM WIND	3-Jun-90	1840	0	0	0	0	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT		TSTM WIND	22-Jun-90	2030	0	0	0	0	0
SUMMIT		HAIL	30-Jun-90	1540	75	0	0	0	0
SUMMIT		HAIL	6-Sep-90	1312	75	0	0	0	0
SUMMIT		TSTM WIND	6-Sep-90	1400	0	0	0	0	0
SUMMIT		HAIL	6-Sep-90	2210	75	0	0	0	0
SUMMIT		TSTM WIND	28-Mar-91	0005	0	0	0	0	0
SUMMIT		TSTM WIND	30-May-91	1830	0	0	0	0	0
SUMMIT		TSTM WIND	7-Jul-91	2100	0	0	0	0	0
SUMMIT		TSTM WIND	7-Jul-91	2140	0	0	0	0	0
SUMMIT		TSTM WIND	23-Jul-91	1040	0	0	0	0	0
SUMMIT		TSTM WIND	23-Jul-91	1044	59	0	0	0	0
SUMMIT		TSTM WIND	13-Aug-91	1725	0	0	0	0	0
SUMMIT		TSTM WIND	17-Aug-91	1528	85	0	0	0	0
SUMMIT		HAIL	14-Jun-92	1305	100	0	0	0	0
SUMMIT		HAIL	14-Jun-92	1500	75	0	0	0	0
SUMMIT		HAIL	10-Jul-92	1316	100	0	0	0	0
SUMMIT		TORNADO	12-Jul-92	1922	0	0	0	2500000	0
SUMMIT		TSTM WIND	12-Jul-92	2022	0	0	0	0	0
SUMMIT		HAIL	30-Jul-92	1540	75	0	0	0	0
SUMMIT		TSTM WIND	3-Aug-92	2155	51	0	0	0	0
SUMMIT		TSTM WIND	8-Aug-92	1745	0	0	0	0	0
SUMMIT		HAIL	30-Aug-92	1030	100	0	0	0	0
SUMMIT		TSTM WIND	9-Sep-92	1530	0	0	0	0	0
SUMMIT	Akron	HIGH WINDS	28-May-93	1825	0	0	0	50000	0
SUMMIT	Twinsburg	THUNDERSTORM WINDS	31-Aug-93	1405	0	0	0	5000	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT		THUNDERSTORM WINDS	2-Sep-93	1840	0	0	0	5000	0
SUMMIT	Clinton	FLOOD	11-Apr-94	1000	0	0	0	500000	0
SUMMIT	Countywide	FLASH FLOOD	12-Apr-94	0315	0	0	0	5000000	0
SUMMIT	Old Portage	FLOOD	12-Apr-94	0810	0	0	0	5000	0
SUMMIT	Akron-Canton	THUNDERSTORM WINDS	24-May-94	1445	0	0	0	5000	0
SUMMIT	Copley	THUNDERSTORM WINDS	15-Jun-94	1735	0	0	0	5000	0
SUMMIT	Northfield	THUNDERSTORM WINDS	20-Jun-94	1705	0	0	0	5000	0
SUMMIT	Barberton	THUNDERSTORM WINDS	2-Jul-94	1350	0	0	0	5000	0
SUMMIT	N Portion	THUNDERSTORM WINDS	6-Jul-94	2130	0	0	0	5000	0
SUMMIT	N Portion	FLASH FLOOD	7-Jul-94	1635	0	0	0	5000000	0
SUMMIT	Nimilson State Park	THUNDERSTORM WINDS	7-Jul-94	1635	0	0	0	5000	0
SUMMIT	N Portion	FLASH FLOOD	13-Aug-94	0615	0	0	0	5000000	0
SUMMIT	Richfield	THUNDERSTORM WINDS	13-Aug-94	2002	0	0	0	5000	0
SUMMIT	Northfield	HAIL	25-Sep-94	1405	100	0	0	0	0
SUMMIT		THUNDERSTORM WINDS	24-May-95	1355	0	0	0	20000	0
SUMMIT	outdoors of his place	HAIL	24-May-95	1400	75	0	0	0	0
SUMMIT	motor home was damage	LIGHTNING	24-May-95	1400	0	1	0	0	0
SUMMIT	removed and trees wer	THUNDERSTORM WINDS	24-May-95	1400	0	0	0	30000	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	Garfield Heights	THUNDERSTORM WINDS	24-May-95	1402	0	0	0	100000	0
SUMMIT	Countywide	HAIL	24-May-95	0000	100	0	0	0	0
SUMMIT		THUNDERSTORM WINDS	24-May-95	1330	0	0	0	3000	0
SUMMIT		THUNDERSTORM WINDS	29-May-95	0014	0	0	0	5000	0
SUMMIT	Copley Center	TORNADO F1	29-May-95	0015	0	0	0	1500000	0
SUMMIT	Countywide	FLASH FLOOD	3-Jun-95	1344	0	0	0	5000	0
SUMMIT	Akron-Kenmore Area	HAIL	3-Jun-95	1347	100	0	0	0	0
SUMMIT	Akron-east side	HAIL	3-Jun-95	1405	75	0	0	0	0
SUMMIT	Springfield Township	THUNDERSTORM WINDS	10-Jun-95	1812	0	0	0	40000	0
SUMMIT	Richfield	HAIL	21-Jun-95	1323	75	0	0	0	0
SUMMIT	South part	HAIL	21-Jun-95	1644	175	0	0	4000	0
SUMMIT	Macedonia	HAIL	21-Jun-95	1910	75	0	0	0	0
SUMMIT	Copley	HAIL	22-Jun-95	1736	75	0	0	0	0
SUMMIT	Akron area	FLASH FLOOD	25-Jun-95	1430	0	0	0	40000	0
SUMMIT	Hudson	FLASH FLOOD	26-Jun-95	1350	0	0	0	0	0
SUMMIT	Countywide	HAIL	27-Jun-95	1308	75	0	1	30000	0
SUMMIT	Barberton	LIGHTNING	27-Jun-95	1432	0	0	0	0	0
SUMMIT	Countywide	FLASH FLOOD	27-Jun-95	1435	0	0	0	800000	0
SUMMIT	North half	FLASH FLOOD	28-Jun-95	2125	0	0	0	10000	0
SUMMIT	North half	HAIL	28-Jun-95	2125	75	0	0	10000	0
SUMMIT	Countywide	THUNDERSTORM WINDS	13-Jul-95	1930	0	0	0	160000	0
SUMMIT	Countywide	THUNDERSTORM WINDS	15-Jul-95	1845	0	0	0	20000	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	Peninsula	THUNDERSTORM WINDS	16-Jul-95	2035	0	0	0	2000	0
SUMMIT	South Half	FLASH FLOOD	25-Jul-95	1409	0	0	0	15000	0
SUMMIT	Akron area	LIGHTNING	25-Jul-95	1430	0	0	1	0	0
SUMMIT	North and West Half	FLASH FLOOD	9-Aug-95	0925	0	0	0	250000	0
SUMMIT	North and West Half	LIGHTNING	9-Aug-95	0925	0	0	0	80000	0
SUMMIT	Stow and Cuyahoga	THUNDERSTORM WINDS	13-Aug-95	2057	0	0	0	3000	0
SUMMIT	NORTH HALF	TSTM WIND	12-Apr-96	06:00:00 PM	55	0	0	20000	0
SUMMIT	BARBERTON	LIGHTNING	15-Apr-96	05:00:00 PM	0	0	0	0	0
SUMMIT	COUNTYWIDE	FLASH FLOOD	23-Apr-96	09:00:00 AM	0	0	0	0	0
SUMMIT	AKRON	FLASH FLOOD	10-May-96	06:43:00 PM	0	0	0	0	0
SUMMIT	TALLMADGE	FLASH FLOOD	11-May-96	07:00:00 PM	0	0	0	0	0
SUMMIT	FRANKLIN TWP	FLASH FLOOD	11-May-96	07:30:00 PM	0	0	0	0	0
SUMMIT	CLINTON	HAIL	4-Jun-96	03:00:00 PM	75	0	0	0	0
SUMMIT	TALLMADGE	HAIL	11-Jun-96	03:15:00 PM	75	0	0	0	0
SUMMIT	COUNTYWIDE	FLASH FLOOD	13-Jun-96	04:15:00 PM	0	0	0	0	0
SUMMIT	SPRINGFIELD TOWNSHIP	FLASH FLOOD	13-Jun-96	08:17:00 PM	0	0	0	20000	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	NORTON	FLASH FLOOD	13-Jun-96	08:55:00 PM	0	0	0	0	0
SUMMIT	RICHFIELD	TSTM WIND	14-Jun-96	11:15:00 PM	50	0	0	0	0
SUMMIT	TWINSBURG	FLASH FLOOD	14-Jun-96	11:35:00 PM	0	0	0	20000	0
SUMMIT	COUNTYWIDE	FLASH FLOOD	24-Jun-96	11:51:00 AM	0	0	0	30000	0
SUMMIT	HUDSON	LIGHTNING	24-Jun-96	12:00:00 PM	0	0	0	10000	0
SUMMIT	WEST CENTRAL	TSTM WIND	24-Jun-96	12:15:00 PM	60	0	0	75000	0
SUMMIT	GREENSBURG	TSTM WIND	7-Jul-96	09:20:00 PM	60	0	0	4000	0
SUMMIT	FRANKLIN TWP	TSTM WIND	7-Jul-96	08:45:00 PM	0	0	0	10000	0
SUMMIT	CLINTON	HAIL	7-Jul-96	08:46:00 PM	75	0	0	0	0
SUMMIT	STOW	HAIL	16-Jul-96	07:08:00 PM	75	0	0	0	0
SUMMIT	AKRON	HAIL	8-Aug-96	12:15:00 PM	75	0	0	0	0
SUMMIT	NORTHERN HALF	TSTM WIND	15-Aug-96	02:30:00 PM	0	0	0	3000	0
SUMMIT	TWINSBURG	HAIL	15-Aug-96	12:45:00 PM	88	0	0	0	0
SUMMIT	AKRON	TSTM WIND	15-Aug-96	02:00:00 PM	0	0	0	2000	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	AKRON	LIGHTNING	15-Aug-96	02:25 :00 PM	0	0	0	40000	0
SUMMIT	TWINSBURG	HAIL	15-Aug-96	02:30 :00 PM	75	0	0	0	0
SUMMIT	HUDSON	LIGHTNING	21-Aug-96	01:30 :00 AM	0	0	0	10000	0
SUMMIT	COVENTRY TOWNSHIP	TSTM WIND	7-Nov-96	08:00 :00 PM	0	0	0	0	0
SUMMIT	RICHFIELD	TSTM WIND	1-Dec-96	12:56 :00 PM	50	0	0	5000	0
SUMMIT	BARBERTON	FLASH FLOOD	11-Dec-96	05:45 :00 PM	0	0	0	5000	0
SUMMIT	COUNTYWIDE	OTHER	1-May-97	12:00 :00 AM	0	0	0	0	34480
SUMMIT	AKRON	TSTM WIND	3-May-97	04:43 :00 PM	0	0	0	2000	0
SUMMIT	COUNTYWIDE	FLOOD	1-Jun-97	01:30 :00 PM	0	0	0	25000	15000
SUMMIT	COUNTYWIDE	FLOOD	6/1/1997	09:20:	0	0	0	40000	10000
SUMMIT	TWINSBURG	HAIL	6/25/1997	06:53:	75	0	0	0	0
SUMMIT	COUNTYWIDE	TSTM WIND	6/25/1997	06:36:	0	0	0	30000	0
SUMMIT	CUYAHOGA FALLS	LIGHTNING	8/16/1997	11:00:	0	0	0	80000	0
SUMMIT	BOSTON HGTS	TSTM WIND	8/16/1997	06:43:	0	0	0	3000	0
SUMMIT	MANCHESTER	TSTM WIND	8/16/1997	07:06:	0	0	0	20000	0
SUMMIT	COUNTYWIDE	TSTM WIND	8/16/1997	06:00:	0	0	0	5000	0
SUMMIT	BATH	TSTM WIND	8/16/1997	06:30:	0	0	0	10000	30000

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	SOUTHEAST PORTION	FLOOD	1/9/1998	02:00:	0	0	0	50000	0
SUMMIT	CUYAHOGA FALLS	HAIL	4/8/1998	03:46:	100	0	0	0	0
SUMMIT	RICHFIELD	HAIL	4/8/1998	06:50:	75	0	0	0	0
SUMMIT	MACEDONIA	HAIL	4/8/1998	02:30:	100	0	0	0	0
SUMMIT	TWINSBURG	HAIL	4/8/1998	02:42:	75	0	0	0	0
SUMMIT	NORTON	HAIL	4/8/1998	03:20:	75	0	0	0	0
SUMMIT	COPLEY	HAIL	4/8/1998	03:30:	175	0	0	0	0
SUMMIT	COPLEY	TORNADO	4/9/1998	12:45:	0	0	0	2000	0
SUMMIT	NORTH PORTION	FLOOD	4/16/1998	10:15:	0	0	0	0	0
SUMMIT	AKRON	FLOOD	5/2/1998	08:45:	0	0	0	0	0
SUMMIT	TWINSBURG	TSTM WIND	5/31/1998	05:35:	52	0	0	0	0
SUMMIT	AKRON	HAIL	6/2/1998	02:30:	175	0	0	0	0
SUMMIT	AKRON	TSTM WIND	6/2/1998	03:05:	70	0	0	3000	0
SUMMIT	COUNTYWIDE	TSTM WIND	6/12/1998	07:36:	86	0	0	10000	0
SUMMIT	PORTAGE LAKES	HAIL	6/12/1998	08:12:	75	0	0	0	0
SUMMIT	BARBERTON	TSTM WIND	6/30/1998	03:20:	0	0	0	3000	0
SUMMIT	BARBERTON	HAIL	6/30/1998	12:19:	75	0	0	0	0
SUMMIT	BARBERTON	TSTM WIND	6/30/1998	12:19:	73	0	0	500000	0
SUMMIT	COUNTYWIDE	TSTM WIND	7/21/1998	07:32:	52	0	1	50000	0
SUMMIT	COUNTYWIDE	TSTM WIND	7/21/1998	10:55:	0	0	0	10000	0
SUMMIT	AKRON	FLOOD	8/10/1998	10:00:	0	0	0	0	0
SUMMIT	AKRON	TSTM WIND	8/24/1998	03:00:	0	0	0	50000	0
SUMMIT	COUNTYWIDE	FLOOD	8/25/1998	03:30:	0	0	0	0	0
SUMMIT	COUNTYWIDE	TSTM WIND	8/25/1998	05:30:	0	0	0	5000	0
SUMMIT	CLINTON	HAIL	8/25/1998	12:10:	175	0	0	0	10000
SUMMIT	COUNTYWIDE	TSTM WIND	9/7/1998	06:00:	0	0	0	100000	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	COPLEY	HAIL	9/7/1998	06:08:	75	0	0	0	0
SUMMIT	AKRON ARPT	TSTM WIND	11/10/1998	05:30:	0	0	0	10000	0
SUMMIT	MYERSVILLE	TSTM WIND	7/6/1999	03:05:	0	0	0	10000	0
SUMMIT	COUNTYWIDE	TSTM WIND	7/9/1999	05:35:	0	0	0	700000	0
SUMMIT	SAGAMORE HILLS	TORNADO	7/28/1999	11:04:	0	0	0	75000	0
SUMMIT	NORTHFIELD	TSTM WIND	7/28/1999	11:08:	0	0	0	40000	0
SUMMIT	TWINSBURG	HAIL	7/28/1999	11:10:	75	0	0	0	0
SUMMIT	AKRON ARPT	TSTM WIND	10/13/1999	04:11:	51	0	0	0	0
SUMMIT	AKRON	HAIL	10/13/1999	04:15:	100	0	0	0	0
SUMMIT	COUNTYWIDE	TSTM WIND	10/13/1999	04:31:	0	0	0	40000	0
SUMMIT	COUNTYWIDE	TSTM WIND	5/18/2000	09:14:	0	0	0	75000	0
SUMMIT	GREENSBURG	TSTM WIND	5/23/2000	04:20:	0	0	0	25000	0
SUMMIT	MACEDONIA	HAIL	5/31/2000	05:36:	75	0	0	0	0
SUMMIT	COUNTYWIDE	TSTM WIND	6/14/2000	07:10:	0	0	0	150000	0
SUMMIT	AKRON	TSTM WIND	6/16/2000	04:24:	0	0	0	10000	0
SUMMIT	AKRON	TSTM WIND	6/29/2000	05:45:	0	0	0	10000	0
SUMMIT	AKRON	HAIL	7/14/2000	12:00:	100	0	0	0	0
SUMMIT	BARBERTON	HAIL	7/14/2000	12:14:	75	0	0	0	0
SUMMIT	COUNTYWIDE	TSTM WIND	8/6/2000	10:23:	0	0	0	35000	0
SUMMIT	AKRON CANTON ARPT	TSTM WIND	8/6/2000	10:33:	57	0	0	0	0
SUMMIT	TWINSBURG	TSTM WIND	10/4/2000	03:30:	52	0	0	0	0
SUMMIT	SAGAMORE HILLS	TSTM WIND	10/4/2000	05:35:	0	0	0	10000	0
SUMMIT	NORTHFIELD	FUNNEL CLOUD	5/21/2001	06:20:	0	0	0	0	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	NORTON	TSTM WIND	8/9/2001	03:38:	0	0	0	2000	0
SUMMIT	AKRON	TSTM WIND	8/9/2001	03:55:	0	0	0	2000	0
SUMMIT	MOGADORE	FUNNEL CLOUD	8/9/2001	04:00:	0	0	0	0	0
SUMMIT	BATH	TSTM WIND	10/24/2001	10:05:	0	0	0	5000	0
SUMMIT	GREENSBURG	TSTM WIND	2/20/2002	04:30:	0	0	0	10000	0
SUMMIT	CLINTON	HAIL	4/19/2002	04:18:	88	0	0	10000	0
SUMMIT	LAKEMORE	TSTM WIND	4/28/2002	12:35:	0	0	0	5000	0
SUMMIT	BARBERTON	HAIL	4/28/2002	12:40:	75	0	0	5000	0
SUMMIT	AKRON	TSTM WIND	5/14/2002	04:30:	0	0	0	50000	0
SUMMIT	TALLMADGE	HAIL	5/31/2002	03:55:	75	0	0	5000	0
SUMMIT	TALLMADGE	TSTM WIND	5/31/2002	04:00:	0	0	0	5000	0
SUMMIT	HUDSON	TSTM WIND	5/31/2002	03:30:	0	0	0	3000	0
SUMMIT	MACEDONIA	TSTM WIND	6/4/2002	01:35:	0	0	0	15000	0
SUMMIT	FAIRLAWN	LIGHTNING	6/5/2002	03:00:	0	0	0	75000	0
SUMMIT	RICHFIELD	TSTM WIND	6/14/2002	03:25:	0	0	0	5000	0
SUMMIT	NORTON	HAIL	7/4/2002	05:10:	175	0	0	25000	0
SUMMIT	AKRON	TSTM WIND	7/22/2002	12:58:	0	0	0	2000	0
SUMMIT	CUYAHOGA FALLS	TSTM WIND	7/22/2002	01:00:	0	0	0	2000	0
SUMMIT	RICHFIELD	TSTM WIND	7/28/2002	09:35:	0	0	0	2000	0
SUMMIT	TWINSBURG	TSTM WIND	7/29/2002	07:10:	0	0	0	2000	0
SUMMIT	TALLMADGE	TSTM WIND	7/29/2002	07:15:	0	0	0	10000	0
SUMMIT	COPLEY	TSTM WIND	8/4/2002	04:40:	0	0	0	5000	0
SUMMIT	AKRON CANTON ARPT	TSTM WIND	8/14/2002	03:17:	53	0	0	50000	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	RICHFIELD	TSTM WIND	8/16/2002	02:00:	0	0	0	10000	0
SUMMIT	BARBERTON	TSTM WIND	8/22/2002	05:42:	0	0	0	5000	0
SUMMIT	BARBERTON	TSTM WIND	8/22/2002	06:00:	0	0	0	25000	0
SUMMIT	TWINSBURG	TSTM WIND	8/22/2002	04:15:	0	0	0	10000	0
SUMMIT	BARBERTON	TSTM WIND	8/23/2002	08:15:	0	0	0	20000	0
SUMMIT	AKRON	TSTM WIND	9/3/2002	03:40:	0	0	0	5000	0
SUMMIT	AKRON	TSTM WIND	9/3/2002	04:10:	0	0	0	5000	0
SUMMIT	BATH	HAIL	9/14/2002	08:00:	88	0	0	4000	0
SUMMIT	SAGAMORE HILLS	HAIL	9/19/2002	04:02:	75	0	0	0	0
SUMMIT	MACEDONIA	TORNADO	11/10/2002	07:00:	0	0	0	10200000	0
SUMMIT	FAIRLAWN	HAIL	4/4/2003	11:37:	75	0	0	2000	0
SUMMIT	CUYAHOGA FALLS	TSTM WIND	4/4/2003	11:45:	50	0	0	5000	0
SUMMIT	MACEDONIA	TSTM WIND	5/1/2003	05:30:	50	0	0	5000	0
SUMMIT	PENINSULA	HAIL	5/10/2003	05:45:	75	0	0	0	0
SUMMIT	TWINSBURG	HAIL	5/10/2003	12:30:	75	0	0	0	0
SUMMIT	HUDSON	TSTM WIND	5/15/2003	06:10:	50	0	0	0	0
SUMMIT	CUYAHOGA FALLS	FLASH FLOOD	5/15/2003	07:30:	0	0	0	100000	0
SUMMIT	BARBERTON	HAIL	6/29/2003	07:15:	88	0	0	2000	0
SUMMIT	MOGADORE	TSTM WIND	7/4/2003	03:15:	50	0	0	25000	0
SUMMIT	TWINSBURG	TSTM WIND	7/6/2003	01:00:	50	0	0	20000	0
SUMMIT	COUNTYWIDE	TSTM WIND	7/7/2003	09:10:	50	0	0	50000	0
SUMMIT	COUNTYWIDE	TSTM WIND	7/7/2003	03:20:	52	0	0	25000	0
SUMMIT	AKRON	HAIL	7/7/2003	03:28:	88	0	0	2000	0
SUMMIT	COUNTYWIDE	TSTM WIND	7/7/2003	03:28:	50	0	0	15000	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	COUNTYWIDE	TSTM WIND	7/7/2003	02:15:	50	0	0	15000	0
SUMMIT	BARBERTON	TSTM WIND	7/7/2003	02:20:	50	0	0	15000	0
SUMMIT	COUNTYWIDE	TSTM WIND	7/8/2003	04:30:	50	0	0	250000	0
SUMMIT	HUDSON	HAIL	7/8/2003	12:10:	75	0	0	0	0
SUMMIT	BOSTON HGTS	TSTM WIND	7/8/2003	04:45:	50	0	0	25000	0
SUMMIT	FAIRLAWN	TSTM WIND	7/8/2003	04:59:	50	0	0	2000	0
SUMMIT	COUNTYWIDE	FLASH FLOOD	7/21/2003	06:45:	0	3	0	100000000	0
SUMMIT	COUNTYWIDE	TSTM WIND	7/21/2003	06:03:	50	0	0	15000	0
SUMMIT	COUNTYWIDE	FLASH FLOOD	7/22/2003	11:05:	0	0	0	500000	0
SUMMIT	HUDSON	TSTM WIND	7/27/2003	05:00:	50	0	0	50000	0
SUMMIT	SOUTH PORTION	FLASH FLOOD	7/27/2003	06:15:	0	0	0	750000	0
SUMMIT	COUNTYWIDE	TSTM WIND	8/4/2003	06:30:	50	0	0	5000	0
SUMMIT	GREENSBURG	TSTM WIND	8/5/2003	04:00:	50	0	0	5000	0
SUMMIT	LAKEMORE	TSTM WIND	8/5/2003	05:00:	50	0	0	2000	0
SUMMIT	CUYAHOGA FALLS	TSTM WIND	8/27/2003	12:40:	50	0	0	3000	0
SUMMIT	TALLMADGE	TSTM WIND	8/27/2003	12:45:	50	0	0	10000	0
SUMMIT	GREENSBURG	HAIL	9/26/2003	09:25:	75	0	0	0	0
SUMMIT	CUYAHOGA FALLS	HAIL	4/17/2004	04:49:	100	0	0	0	0
SUMMIT	MUNROE FALLS	HAIL	4/17/2004	04:54:	100	0	0	5000	0
SUMMIT	AKRON	HAIL	5/10/2004	07:09:	75	0	0	0	0
SUMMIT	FAIRLAWN	HAIL	5/10/2004	07:09:	75	0	0	0	0
SUMMIT	MOGADORE	HAIL	5/10/2004	08:20:	75	0	0	0	0
SUMMIT	CUYAHOGA FALLS	HAIL	5/17/2004	06:15:	100	0	0	2000	0
SUMMIT	CUYAHOGA FALLS	TSTM WIND	5/18/2004	03:45:	52	0	0	40000	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	TALLMADGE	TSTM WIND	5/18/2004	03:49:	50	0	0	10000	0
SUMMIT	BATH	TSTM WIND	5/21/2004	02:15:	50	0	0	3000	0
SUMMIT	COUNTYWIDE	FLASH FLOOD	5/21/2004	02:26:	0	0	0	2400000	0
SUMMIT	HUDSON	HAIL	5/21/2004	03:15:	75	0	0	0	0
SUMMIT	COUNTYWIDE	TSTM WIND	5/21/2004	03:20:	52	0	0	750000	0
SUMMIT	AKRON	HAIL	5/22/2004	12:00:	75	0	0	0	0
SUMMIT	CUYAHOGA FALLS	HAIL	5/22/2004	12:35:	100	0	0	2000	0
SUMMIT	STOW	HAIL	5/22/2004	12:47:	100	0	0	2000	0
SUMMIT	COUNTYWIDE	FLASH FLOOD	5/22/2004	12:56:	0	0	0	8100000	0
SUMMIT	CUYAHOGA FALLS	TSTM WIND	5/22/2004	01:30:	50	0	0	4000	0
SUMMIT	HUDSON	HAIL	5/24/2004	03:09:	75	0	0	0	0
SUMMIT	MACEDONIA	HAIL	6/9/2004	04:35:	88	0	0	0	0
SUMMIT	COUNTYWIDE	TSTM WIND	6/14/2004	05:00:	50	0	0	15000	0
SUMMIT	CLINTON	HAIL	6/17/2004	07:54:	75	0	0	0	0
SUMMIT	STOW	HAIL	6/24/2004	05:04:	75	0	0	0	0
SUMMIT	PENINSULA	LIGHTNING	6/24/2004	05:30:	0	0	9	0	0
SUMMIT	GREENSBURG	TSTM WIND	6/24/2004	06:47:	50	0	0	15000	0
SUMMIT	TALLMADGE	TSTM WIND	4/20/2005	03:45:	50	0	0	2000	0
SUMMIT	CLINTON	HAIL	5/10/2005	04:45:	75	0	0	0	0
SUMMIT	CUYAHOGA FALLS	HAIL	5/13/2005	07:30:	125	0	0	0	0
SUMMIT	BARBERTON	HAIL	5/23/2005	01:00:	75	0	0	0	0
SUMMIT	GREENSBURG	HAIL	6/14/2005	03:07:	75	0	0	0	0
SUMMIT	PORTAGE LAKES	HAIL	6/14/2005	03:20:	100	0	0	10000	0
SUMMIT	GREENSBURG	TSTM WIND	6/30/2005	01:45:	50	0	0	6000	0
SUMMIT	BATH CENTER	TSTM WIND	7/13/2005	06:40:	50	0	0	2000	0
SUMMIT	TALLMADGE	HAIL	7/18/2005	12:06:	75	0	0	0	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	(CAK)CANTON ARPT	TSTM WIND	7/26/2005	03:39:	53	0	0	0	0
SUMMIT	CUYAHOGA FALLS	TSTM WIND	7/26/2005	06:48:	50	0	0	8000	0
SUMMIT	BATH	TSTM WIND	7/26/2005	06:50:	50	0	0	6000	0
SUMMIT	GREENSBURG	TSTM WIND	7/26/2005	04:28:	50	0	0	2000	0
SUMMIT	TWINSBURG	TSTM WIND	7/26/2005	05:39:	50	0	0	4000	0
SUMMIT	TWINSBURG	TSTM WIND	7/26/2005	05:45:	50	0	0	30000	0
SUMMIT	TWINSBURG	TSTM WIND	7/26/2005	05:50:	50	0	0	2000	0
SUMMIT	BARBERTON	TSTM WIND	8/20/2005	01:30:	50	0	0	15000	0
SUMMIT	GREENSBURG	HAIL	8/20/2005	01:46:	75	0	0	0	0
SUMMIT	FAIRLAWN	HAIL	4/7/2006	05:10:	75	0	0	0	0
SUMMIT	CUYAHOGA FALLS	HAIL	4/7/2006	05:16:	75	0	0	0	0
SUMMIT	STOW	HAIL	4/7/2006	05:20:	75	0	0	0	0
SUMMIT	CUYAHOGA FALLS	HAIL	4/7/2006	03:03:	75	0	0	0	0
SUMMIT	BATH	HAIL	4/12/2006	05:28:	75	0	0	0	0
SUMMIT	CUYAHOGA FALLS	HAIL	4/12/2006	05:36:	75	0	0	0	0
SUMMIT	AKRON	HAIL	4/12/2006	05:42:	75	0	0	0	0
SUMMIT	CUYAHOGA FALLS	HAIL	4/12/2006	05:50:	100	0	0	3000	0
SUMMIT	CUYAHOGA FALLS	HAIL	4/23/2006	05:05:	75	0	0	0	0
SUMMIT	TWINSBURG	HAIL	5/17/2006	02:53:	75	0	0	0	0
SUMMIT	CLINTON	TSTM WIND	5/25/2006	08:35:	50	0	0	4000	0
SUMMIT	BARBERTON	TSTM WIND	5/25/2006	06:40:	50	0	0	10000	0
SUMMIT	FAIRLAWN	HAIL	5/31/2006	01:05:	75	0	0	0	0
SUMMIT	NORTH PORTION	FLASH FLOOD	6/22/2006	03:55:	0	0	0	5800000	0
SUMMIT	FAIRLAWN	HAIL	6/22/2006	03:56:	175	0	0	10000	0
SUMMIT	AKRON	TSTM WIND	6/22/2006	04:10:	50	0	0	2000	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	RICHFIELD	TSTM WIND	6/22/2006	03:25:	50	0	0	4000	0
SUMMIT	BATH	FLASH FLOOD	6/26/2006	03:00:	0	0	0	150000	0
SUMMIT	MANCHESTER	TSTM WIND	7/2/2006	07:55:	50	0	0	12000	0
SUMMIT	BARBERTON	TSTM WIND	7/2/2006	08:00:	50	0	0	8000	0
SUMMIT	MOGADORE	TSTM WIND	7/10/2006	01:06:	50	0	0	6000	0
SUMMIT	BARBERTON	TSTM WIND	7/10/2006	01:49:	50	0	0	5000	0
SUMMIT	AKRON	TSTM WIND	7/10/2006	12:55:	50	0	0	15000	0
SUMMIT	PENINSULA	TSTM WIND	7/20/2006	01:10:	50	0	0	4000	0
SUMMIT	PENINSULA	TSTM WIND	7/30/2006	05:25:	50	0	0	4000	0
SUMMIT	AKRON	HAIL	7/31/2006	04:02:	100	0	0	10000	0
SUMMIT	COUNTYWIDE	FLASH FLOOD	7/31/2006	04:25:	0	0	0	4500000	0
SUMMIT	BOSTON HGTS	THUNDERSTORM WIND	10/11/2006	19:15:	50	0	0	3000	0
SUMMIT	TWINSBURG	HAIL	5/1/2007	18:07:	88	0	0	0	0
SUMMIT	AKRON	HAIL	6/8/2007	14:05:	425	0	0	105000000	0
SUMMIT	FAIRLAWN	HAIL	6/8/2007	15:00:	75	0	0	0	0
SUMMIT	FAIRLAWN	THUNDERSTORM WIND	6/8/2007	13:45:	52	0	0	0	0
SUMMIT	MACEDONIA	THUNDERSTORM WIND	6/19/2007	14:50:	50	0	0	5000	0
SUMMIT	RICHFIELD	THUNDERSTORM WIND	6/19/2007	15:30:	50	0	0	25000	0
SUMMIT	HUDSON	THUNDERSTORM WIND	6/19/2007	14:33:	50	0	0	2000	0
SUMMIT	FAIRLAWN	THUNDERSTORM WIND	6/21/2007	14:12:	56	0	0	0	0
SUMMIT	RICHFIELD	HAIL	6/21/2007	14:35:	75	0	0	0	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	GREENSBURG	THUNDERSTORM WIND	6/27/2007	16:30:	50	0	0	25000	0
SUMMIT	CUYAHOGA FALLS	THUNDERSTORM WIND	7/19/2007	18:27:	50	0	0	4000	0
SUMMIT	BARBERTON	HAIL	7/24/2007	15:00:	75	0	0	0	0
SUMMIT	RICHFIELD	THUNDERSTORM WIND	8/7/2007	21:15:	50	0	0	15000	0
SUMMIT	BARBERTON	HAIL	8/9/2007	11:35:	100	0	0	25000	0
SUMMIT	PORTAGE LAKES	THUNDERSTORM WIND	8/9/2007	16:00:	50	0	0	50000	0
SUMMIT	NORTON	FLASH FLOOD	8/20/2007	09:51:	0	0	0	250000	0
SUMMIT	GREENSBURG	THUNDERSTORM WIND	1/30/2008	00:20:	50	0	0	1000	0
SUMMIT	BARBERTON	THUNDERSTORM WIND	5/2/2008	18:00:	50	0	0	6000	0
SUMMIT	SAGAMORE HILLS	HAIL	6/21/2008	16:53:	75	0	0	0	0
SUMMIT	CUYAHOGA FALLS	HAIL	6/21/2008	17:00:	175	0	0	300000	0
SUMMIT	BARBERTON	THUNDERSTORM WIND	6/21/2008	17:00:	50	0	0	3000	0
SUMMIT	AKRON	HAIL	6/21/2008	17:03:	75	0	0	0	0
SUMMIT	MACEDONIA	HAIL	6/21/2008	17:04:	75	0	0	0	0
SUMMIT	STOW	HAIL	6/21/2008	17:10:	88	0	0	0	0
SUMMIT	HUDSON	HAIL	6/21/2008	17:16:	75	0	0	0	0
SUMMIT	CUYAHOGA FALLS	HAIL	6/21/2008	17:22:	88	0	0	0	0
SUMMIT	AKRON	HAIL	6/21/2008	17:30:	88	0	0	0	0
SUMMIT	AKRON	HAIL	6/21/2008	17:30:	88	0	0	3000	0
SUMMIT	CLINTON	HAIL	6/22/2008	14:45:	75	0	0	0	0
SUMMIT	AKRON	HAIL	6/22/2008	14:01:	100	0	0	0	0
SUMMIT	STOW	HAIL	6/23/2008	15:25:	75	0	0	0	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	CUYAHOGA FALLS	HAIL	6/23/2008	15:15:	75	0	0	0	0
SUMMIT	AKRON	HAIL	6/23/2008	15:18:	88	0	0	0	0
SUMMIT	GREENSBURG	THUNDERSTORM WIND	6/26/2008	16:11:	52	0	0	2000	0
SUMMIT	LAKEMORE	THUNDERSTORM WIND	6/26/2008	15:22:	50	0	0	8000	0
SUMMIT	BATH	HAIL	6/26/2008	15:30:	75	0	0	0	0
SUMMIT	STOW	THUNDERSTORM WIND	6/26/2008	15:39:	50	0	0	2000	0
SUMMIT	NORTON	HAIL	6/26/2008	17:17:	75	0	0	0	0
SUMMIT	EAST LIBERTY	THUNDERSTORM WIND	6/26/2008	17:35:	50	0	0	6000	0
SUMMIT	PENINSULA	THUNDERSTORM WIND	7/8/2008	16:12:	50	0	0	5000	0
SUMMIT	CUYAHOGA FALLS	HAIL	7/22/2008	16:53:	75	0	0	0	0
SUMMIT	MUNROE FALLS	HAIL	7/22/2008	16:56:	100	0	0	5000	0
SUMMIT	TALLMADGE	HAIL	7/22/2008	17:04:	100	0	0	5000	0
SUMMIT	NORTON	THUNDERSTORM WIND	7/26/2008	18:26:	50	0	0	100000	0
SUMMIT	SHERMAN	HAIL	7/26/2008	18:26:	175	0	0	1500000	0
SUMMIT	CLINTON	HAIL	8/7/2008	20:40:	75	0	0	0	0
SUMMIT	AKRON	HAIL	3/7/2009	09:54:	100	0	0	0	0
SUMMIT	BATH	HAIL	6/1/2009	09:15:	88	0	0	0	0
SUMMIT	AULTMAN	HAIL	6/1/2009	09:43:	75	0	0	0	0
SUMMIT	AKRON	HAIL	6/1/2009	09:15:	125	0	0	50000	0
SUMMIT	AKRON	THUNDERSTORM WIND	8/10/2009	04:05:	50	0	0	15000	0
SUMMIT	RICHFIELD	THUNDERSTORM WIND	8/20/2009	05:00:	50	0	0	1000	0
SUMMIT	NORTON	HAIL	6/2/2010	03:32:	100	0	0	0	0
SUMMIT	MOGADORE	HAIL	6/2/2010	03:43:	100	0	0	0	0
SUMMIT	AKRON	HAIL	6/2/2010	03:34:	75	0	0	0	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	AKRON ARPT	HAIL	6/2/2010	03:45:	75	0	0	0	0
SUMMIT	ELLET	HAIL	6/2/2010	03:45:	125	0	0	5000	0
SUMMIT	RICHFIELD	HAIL	6/3/2010	05:37:	75	0	0	0	0
SUMMIT	STOW	THUNDERSTORM WIND	6/23/2010	02:43:	52	0	0	0	0
SUMMIT	PENINSULA	THUNDERSTORM WIND	6/23/2010	03:30:	50	0	0	2000	0
SUMMIT	STOW	THUNDERSTORM WIND	6/23/2010	02:55:	50	0	0	2000	0
SUMMIT	CUYAHOGA FALLS	THUNDERSTORM WIND	6/23/2010	02:48:	54	0	0	0	0
SUMMIT	AKRON	THUNDERSTORM WIND	6/23/2010	02:39:	50	0	0	2000	0
SUMMIT	SILVER LAKE	THUNDERSTORM WIND	6/23/2010	02:45:	50	0	0	2000	0
SUMMIT	AKRON	THUNDERSTORM WIND	6/27/2010	04:30:	50	0	0	1000	0
SUMMIT	STOW	THUNDERSTORM WIND	7/24/2010	06:30:	50	0	0	1000	0
SUMMIT	CLINTON	THUNDERSTORM WIND	7/28/2010	07:40:	50	0	0	10000	0
SUMMIT	AKRON	HAIL	9/7/2010	04:44:	88	0	0	0	0
SUMMIT	TWINSBURG	FLOOD	2/28/2011	06:00:	0	0	0	300000	0
SUMMIT	AKRON	HAIL	4/20/2011	12:24:	100	0	0	0	0
SUMMIT	BARBERTON	HAIL	6/4/2011	05:00:	100	0	0	0	0
SUMMIT	AULTMAN	HAIL	6/7/2011	07:33:	100	0	0	0	0
SUMMIT	AKRON	THUNDERSTORM WIND	6/16/2011	03:18:	51	0	0	0	0
SUMMIT	AKRON	HAIL	6/21/2011	08:29:	125	0	0	15000	0
SUMMIT	(CAK)CANTON ARPT	FLASH FLOOD	7/19/2011	03:45:	0	0	0	500000	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	BATH CENTER	FLASH FLOOD	7/19/2011	04:15:	0	0	0	1500000	75000
SUMMIT	STOW	HAIL	8/1/2011	02:00:	75	0	0	0	0
SUMMIT	AKRON	HAIL	8/1/2011	02:06:	75	0	0	0	0
SUMMIT	AKRON	HAIL	8/1/2011	01:30:	100	0	0	0	0
SUMMIT	AKRON	HAIL	8/1/2011	01:30:	100	0	0	0	0
SUMMIT	FAIRLAWN	HAIL	8/1/2011	01:40:	100	0	0	0	0
SUMMIT	BARBERTON	HAIL	8/9/2011	07:40:	88	0	0	0	0
SUMMIT	MACEDONIA	HAIL	8/19/2011	03:00:	100	0	0	0	0
SUMMIT	NORTHFIELD	HAIL	8/19/2011	03:00:	100	0	0	0	0
SUMMIT	TWINSBURG	HAIL	8/19/2011	03:07:	75	0	0	0	0
SUMMIT	BARBERTON	HAIL	8/24/2011	11:50:	100	0	0	0	0
SUMMIT	CUYAHOGA FALLS	HAIL	8/25/2011	12:10:	75	0	0	0	0
SUMMIT	CUYAHOGA FALLS	HAIL	11/14/2011	06:35:	75	0	0	0	0
SUMMIT	STOW	HAIL	11/14/2011	06:55:	75	0	0	0	0
SUMMIT	AKRON	THUNDERSTORM WIND	1/17/2012	04:35:	50	0	0	7000	0
SUMMIT	TWINSBURG	HAIL	5/9/2012	03:00:	75	0	0	0	0
SUMMIT	AKRON	HAIL	7/4/2012	08:48:	88	0	0	0	0
SUMMIT	AKRON	HAIL	7/4/2012	08:56:	175	0	0	750000	0
SUMMIT	AKRON	HAIL	7/4/2012	08:45:	88	0	0	0	0
SUMMIT	CUYAHOGA FALLS	HAIL	7/4/2012	08:37:	88	0	0	0	0
SUMMIT	AKRON	HAIL	7/4/2012	08:58:	100	0	0	0	0
SUMMIT	MOGADORE	HAIL	7/4/2012	09:03:	175	0	0	1500000	0
SUMMIT	TALLMADGE	HAIL	7/4/2012	08:51:	250	0	0	5000000	0
SUMMIT	LAKEMORE	THUNDERSTORM WIND	7/5/2012	06:25:	50	0	0	1000	0
SUMMIT	NORTHFIELD	THUNDERSTORM WIND	7/5/2012	06:10:	50	0	0	1000	0
SUMMIT	FAIRLAWN	THUNDERSTORM WIND	7/5/2012	06:19:	50	0	0	1000	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT	AKRON	THUNDERSTORM WIND	7/26/2012	02:30:	50	0	0	5000	0
SUMMIT	AKRON	HAIL	9/6/2012	03:35:	75	0	0	0	0
SUMMIT	AKRON	HAIL	9/6/2012	03:37:	100	0	0	0	0
SUMMIT	SAGAMORE HILLS	HAIL	9/6/2012	01:46:	75	0	0	0	0
SUMMIT	TALLMADGE	THUNDERSTORM WIND	9/7/2012	04:00:	50	0	0	6000	0
SUMMIT	SAGAMORE HILLS	THUNDERSTORM WIND	9/7/2012	01:30:	50	0	0	2000	0
SUMMIT	CUYAHOGA FALLS	HAIL	9/7/2012	03:32:	88	0	0	0	0
SUMMIT	CUYAHOGA FALLS	HAIL	9/7/2012	03:36:	100	0	0	0	0
SUMMIT CO.	AKRON	Thunderstorm Wind	4/10/2013	1610	50	0	0	10000	0
SUMMIT CO.	AKRON	Thunderstorm Wind	6/13/2013	130	50	0	0	1000	0
SUMMIT CO.	NORTON	Hail	6/25/2013	1435	1	0	0	0	0
SUMMIT CO.	LAKEMORE	Hail	6/25/2013	1457	1	0	0	2000	0
SUMMIT CO.	NORTHFIELD	Thunderstorm Wind	6/25/2013	2015	50	0	0	60000	0
SUMMIT CO.	AKRON	Hail	6/29/2013	1542	1	0	0	2000	0
SUMMIT CO.	LOYAL OAK	Flash Flood	7/10/2013	1400		0	0	375000	0
SUMMIT CO.	AKRON	Flash Flood	7/10/2013	1430		0	0	3800000	0
SUMMIT CO.	TALLMADGE	Flash Flood	7/10/2013	1450		0	0	175000	0
SUMMIT CO.	CUYAHOGA FALLS	Hail	7/10/2013	1450	0.75	0	0	0	0
SUMMIT CO.	BARBERTON	Flash Flood	7/10/2013	1520		0	0	15000000	0
SUMMIT CO.	GREENSBURG	Thunderstorm Wind	7/10/2013	1535	50	0	0	8000	0
SUMMIT CO.	AKRON	Hail	7/23/2013	1455	1	0	0	1000	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT CO.		Thunderstorm Wind	10/6/2013	1900	50	0	0	2000	0
SUMMIT CO.		Thunderstorm Wind	10/6/2013	1910	50	0	0	5000	0
SUMMIT CO.	GREENSBURG	Thunderstorm Wind	11/17/2013	2010	50	0	0	15000	0
SUMMIT CO.	TWINSBURG	Thunderstorm Wind	11/17/2013	2015	50	0	0	3000	0
SUMMIT CO.	AKRON	Thunderstorm Wind	12/22/2013	115	50	0	0	5000	0
SUMMIT (ZONE)		Extreme Cold/Wind Chill	1/6/2014	1300		0	0	0	0
SUMMIT (ZONE)		Winter Storm	1/25/2014	100		0	0	400000	0
SUMMIT (ZONE)		Extreme Cold/Wind Chill	1/28/2014	400		0	0	0	0
SUMMIT (ZONE)		Winter Storm	2/4/2014	2200		0	0	100000	0
SUMMIT (ZONE)		Winter Storm	2/17/2014	2000		0	0	300000	0
SUMMIT CO.	COPLEY	Hail	5/12/2014	1941	0.75	0	0	0	0
SUMMIT CO.	AKRON	Hail	5/12/2014	2003	0.75	0	0	0	0
SUMMIT CO.	SILVER LAKE	Flash Flood	5/12/2014	2030		0	0	11000000	0
SUMMIT CO.	AKRON	Hail	5/12/2014	2100	1	0	0	0	0
SUMMIT CO.	MUNROE FALLS	Flash Flood	5/12/2014	2110		0	0	1500000	0
SUMMIT CO.	STOW	Flash Flood	5/12/2014	2115		0	0	7000000	0
SUMMIT CO.	COPLEY	Hail	5/14/2014	1500	1	0	0	0	0
SUMMIT CO.	FAIRLAWN	Hail	5/14/2014	1501	0.75	0	0	0	0
SUMMIT CO.	CUYAHOGA FALLS	Hail	5/14/2014	1520	1	0	0	0	0
SUMMIT CO.	FAIRLAWN	Thunderstorm Wind	5/27/2014	1635	50	0	0	15000	0
SUMMIT CO.	FAIRLAWN	Thunderstorm Wind	5/27/2014	1650	52	0	0	0	0

County	Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage ($)	Crop Damage ($)
SUMMIT CO.	FAIRLAWN	Thunderstorm Wind	5/27/2014	1657	50	0	0	4000	0
SUMMIT CO.	BARBERTON	Thunderstorm Wind	5/27/2014	1934	50	0	0	2000	0
SUMMIT CO.	WEST RICHFIELD	Hail	6/23/2014	1815	0.88	0	0	0	0
					Total	4	12	325 M	175.5 K

15th St. NW

Fairview Crossing

15th St. NW

9-14-79

Frederic did it to us

The heavy rains and flooding that hit the Akron area Thursday night and today were caused by the remnants of Hurricane Frederic, which battered the Gulf Coast on Wednesday.

Frederic, now downgraded to a low pressure system, moved inland and was centered in Tennessee earl
day, heading northeastwa
ward West Virginia,
Middle Atlantic states
New England.

The rain in this area
from the leading edge o
storm, the main part of w
is expected to pass south
of Ohio.

September 14, 1979

Back Yard & Neighbors

Standing on the back steps of the house.

Back Yard

Barber Road flooded

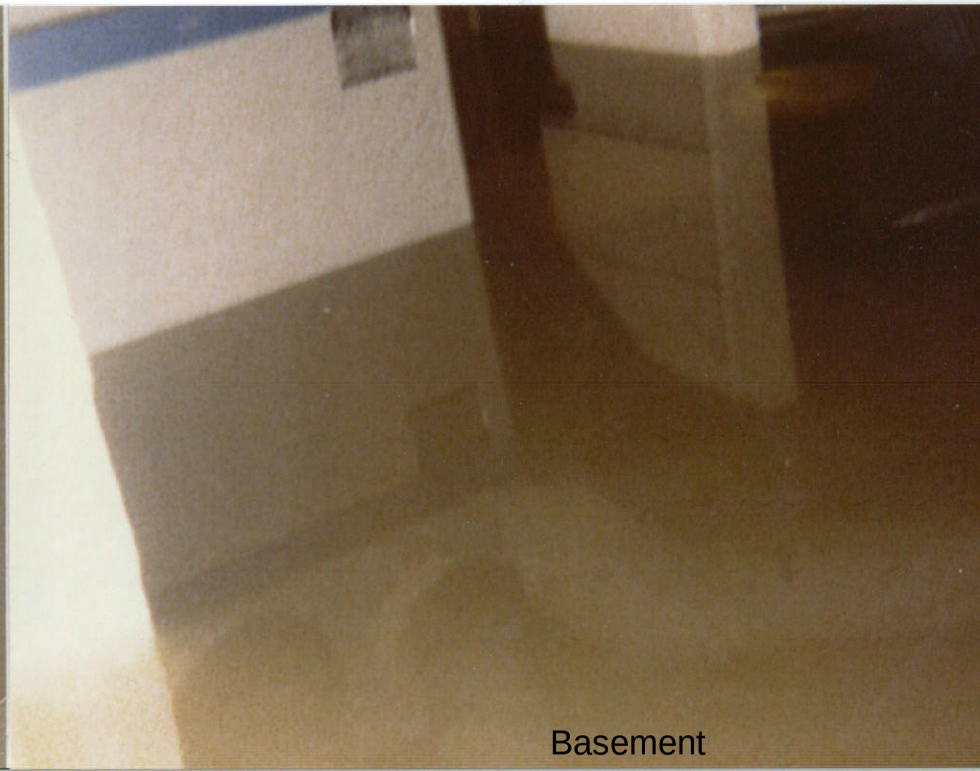
Sept 14, 1979

15th St. NW

Sept. 14,

Basement, washer, dryer floating

Back yard

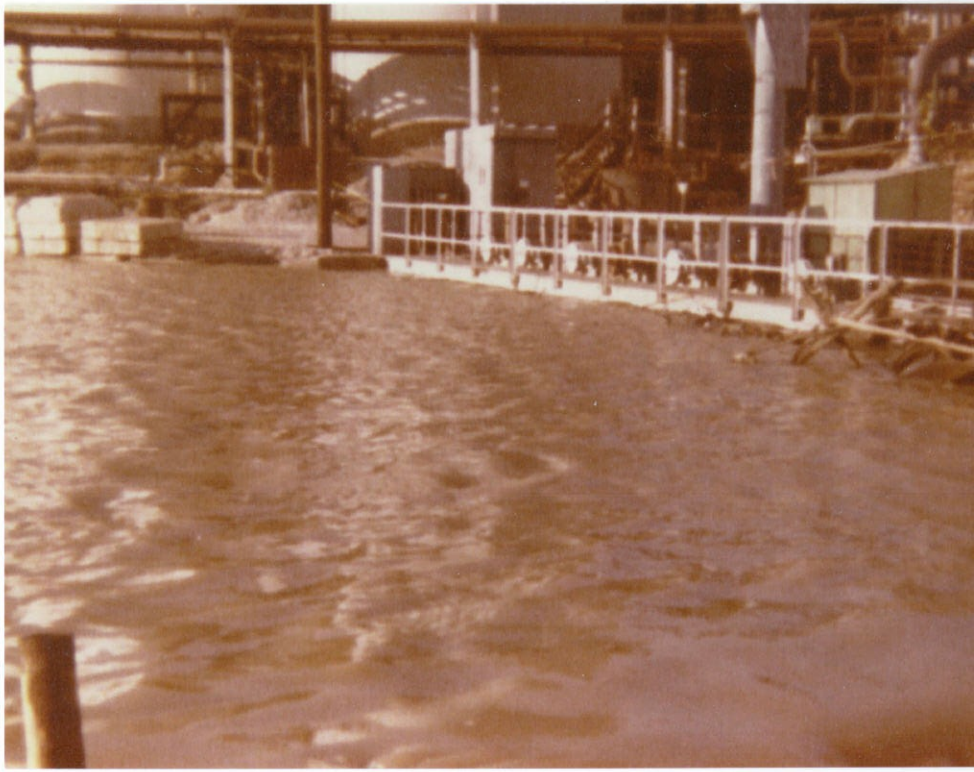


Basement

September 14, 1979

Hudson Run Road

Behind the Chemical



Appendix D

Mitigation Strategies

1.1 JURISDICTIONAL MITIGATION ACTIVITIES

Mitigation goals and actions for the community are summarized in the following tables. Actions identified by the community will be reviewed annually for purposes of tracking progress and or revising implementation approaches.

The following tables list mitigation actions for the jurisdiction. These actions would mitigate the associated hazard and support the corresponding goals of the community. Below are descriptions and definitions of each category within the following tables.

- **Priority:** The priority rankings for each activity. Priority based on benefit / cost and hazard prioritization for each community.
- **Activity Description / Hazard:** This category is a description of the identified project and the primary hazard addressed by each mitigation activity.
- **Agency(s):** The lead department or agency responsible for each action listed.
- **Target Date / Funding Source:** The proposed schedule or time frame for completion of each action or project. Potential funding source of the identified action item.
- **Type:** The type of goal which the project was designed to achieve. These activities are defined below and in Section 4.2.1.
- **Benefit / Cost:** A qualitative description of the expected benefits and costs of implementation of the project. The benefits and costs were defined as described in Section 4.3.2.

The group focused upon various types of activities that could be performed to reduce the risk of natural hazards throughout their community. These activities were categorized as follows:

a. Prevention. (PA) Preventative activities are designed to keep current problems from getting worse and to eliminate the possibility of future problems.

b. Property Protection. (PP) Property protection activities are designed to adapt existing structures to withstand natural hazards or to remove structures away from hazard prone areas.

c. Emergency Services. (ES) Emergency services minimize the impact that a natural hazard has on the residents of a jurisdiction.

d. Structural Projects. (SP) Structural projects lessen the impact of a natural hazard by changing the natural progression of the hazard

e. Public Information and Awareness. (PI) Public information and awareness activities are used to educate the residents of a jurisdiction about the potential hazards that affect their area, hazard prone areas, and mitigation strategies they can take part in to protect themselves and their property.

Table D-1 City of Barberton Action Plan

Priority	Activity Description / Hazard	Agency(s) / Contact	Target Date / Funding Source	Type	Benefit / Cost	Mitigation Action Status
1	**Create a Flood Conservancy District** to address the Barberton Flood Problems on a Watershed Basis. **Flooding**	Mayor	1/1/2015 – 12/31/2020 Community General Funds	PI	High / High	New
2	**Purchase flood prone properties on 14th St. NW, Wooster Rd.** West to Shannon Ave. Eliminate street and utilities and create a green space floodwater storage area. **Flooding**	Mayor, Barberton Stormwater & Floodplain Administration	1/1/2015 – 12/31/2020 HMGP, Stormwater Fees, CBDG	PP	Medium / Medium	New
3	**Purchase infill properties in the South Barberton flood zone,** create small floodwater storage basins. **Flooding**	Mayor, Planning Department, Barberton Stormwater & Floodplain Administration	1/1/2015 – 12/31/2020 Stormwater Fees	PP	Medium / Medium	New
4	**Construct additional storm sewers** and curbs to store additional stormwater in the South Barberton Stanley Ave. area. **Flooding**	Mayor, Barberton Stormwater & Floodplain Administration	12/31/2014 – 12/31/2015 Stormwater Fees, Infrastructure Reserve	SP	Medium / Medium	New
5	**Purchase flood prone properties on Arthur St.** in the South Barberton area. Create a green space floodwater storage area. **Flooding**	Mayor, Barberton Stormwater & Floodplain Administration	1/1/2015 – 12/31/2020 HMGP, Stormwater Fees, CBDG	PP	Medium / Low	New

Prevention. (PA); Property Protection. (PP); Emergency Services. (ES); Structural Projects. (SP); Public Information and Awareness. (PI)

Table D-1 City of Barberton Action Plan (Continued)

Priority	Activity Description / Hazard	Agency(s)	Target Date / Funding Source	Type	Benefit / Cost	Mitigation Action Status
6	**Residential construction in the South Barberton area** prior to the July 2009 FEMA FIRM Map Revision was not in a 100 yr. Flood Zone. A number of post-1990 residences, now in the flood zone, include basements that are subject to flooding. First floor elevations are generally above the Base Flood Elevation. Initiate a program of filling in the basements and relocating the mechanicals to above the Base Flood Elevation.	Mayor, Barberton Stormwater & Floodplain Administration	1/1/2015 – 12/31/2020	PP	Medium / Medium	New
	Flooding		HMGP, Stormwater Fees,			
7	**Construct a Flood Gate and Pump System** for the South Barberton Stanley Ave. area to minimize storm sewer backups and subsequent flooding of the area.	Mayor, Barberton Stormwater & Floodplain Administration	1/1/2015 – 12/31/2020	SP	Medium / Medium	New
	Flooding		HMGP, Stormwater Fees,			
8	**Barberton owns 16 acres of land for the City water well field** at the confluence of Wolf and Pigeon Creeks. City is studying the potential for creating a flood storage basin to reduce flooding for the 14th St. NW and South Barberton flood zones.	Mayor, Utilities Department - Director, Barberton Stormwater & Floodplain Administration	1/1/2015 – 12/31/2020	SP	High / High	New
	Flooding		Flood Conservancy District. Stormwater Fees, Utility Dept.			

Table D-1 City of Barberton Action Plan (Continued)

Prevention. (PA); Property Protection. (PP); Emergency Services. (ES); Structural Projects. (SP); Public Information and Awareness. (PI)

Priority	Activity Description / Hazard	Agency(s)	Target Date / Funding Source	Type	Benefit / Cost	Mitigation Action Status
9	**Barberton has a retention basin** on the east side that was constructed in the 1970s. Sedimentation has reduced the capacity of the basin and recent severe storms have caused moderate to severe flooding of five residences. The City has purchased one residence adjacent to the basin, razed the structure and is planning to enlarge the existing stormwater storage area. Future plans call for a significant increase in basin storage. As an alternative the City is examining the purchase of the remaining four flood distressed properties. **Flooding**	Mayor, Utilities Department - Director, Barberton Stormwater & Floodplain Administration	1/1/2014 – 12/31/2015 EPA 319 Funds, Stormwater Fees, Flood Conservancy District	SP	Medium / Medium	New
10	**Mud Run**, on the City's NE side has experienced significant flooding over the past six years. Flooding affects an industrial section of the City. One building that is in the floodplain and floodway is being examined for purchase and removal. **Flooding**	Mayor, Utilities Department - Director, Barberton Stormwater & Floodplain Administration	1/1/2015 – 12/31/2020 HMGP, Stormwater Fees,	SP	Medium / Medium	New
11	**Mud Run**, on the City's NE side has experienced significant flooding over the past six years. Flooding affects an industrial section of the City. Barberton's Harter Park, north of the industrial area, has a large open area adjacent to Mud Run with a potential for floodwater storage. **Flooding**	Mayor, Parks Department, Barberton Stormwater & Floodplain Administration	1/1/2015 – 12/31/2016 Stormwater Fees	SP	Medium / Low	New

Prevention. (PA); Property Protection. (PP); Emergency Services. (ES); Structural Projects. (SP); Public Information and Awareness. (PI)

Table D-1 City of Barberton Action Plan (Continued)

Priority	Activity Description / Hazard	Agency(s)	Target Date / Funding Source	Type	Benefit / Cost	Mitigation Action Status
12	**Edgewood Park** on Barberton's west side has a 2-acre low-lying area that remains wet throughout the year. This area has the potential for stormwater storage by means of constructed wetlands. This potential project would store stormwater from 26th and 27th NW and also diverted stormwater from the 25th St. storm sewer system. **Flooding**	Mayor, Parks Department, Barberton Stormwater & Floodplain Administration	1/1/2015 – 12/31/2020 EPA 319 Funds, Stormwater Fees, Flood Conservancy District	SP	Medium / Low	New
13	**The Trucin Farm area** of southeast Barberton has over 50 acres of wetlands that are classified as Category 1, 2 & 3. The site also contains commercially developable sites. The area has the potential for additional stormwater storage by means of constructed wetlands for Class 1 & 2 Mitigation Projects. This potential project would store stormwater from the Austin Heights area that flows into the South Barberton Flood Zone. **Flooding**	Mayor, Barberton Community Development Corporation-Director, Barberton Stormwater & Floodplain Administration - Flood Conservancy District	1/1/2015 – 12/31/2020 EPA 319 Funds, Stormwater Fees	SP	Medium / Medium	New
14	**Flood Warning System.** – Installation of water level monitors at two floodwater storage basins. -Upper Tuscarawas River/Wolf Creek Stream Gauges. -Resident notification system. -Combine system with the City of Norton and Copley Township. **Flooding**	Mayor, Barberton Police & Fire Departments-Safety Director, Barberton Stormwater & Floodplain Administration, Flood Conservancy District, Adj. Communities	1/1/2015 – 12/31/2020 FEMA Funds, US Geological Survey Stormwater Fees	SP	High / Medium	New

Prevention. (PA); Property Protection. (PP); Emergency Services. (ES); Structural Projects. (SP); Public Information and Awareness. (PI)

Table D-1 City of Barberton Action Plan (Continued)

Priority	Activity Description / Hazard	Agency(s)	Target Date / Funding Source	Type	Benefit / Cost	Mitigation Action Status
15	**Hudson Run**, on City's west side experiences moderate flooding for two apartment complexes and eight residences. The city is examining obtaining vacant floodplain property for additional flood improvements. Also, low lying residential property subject to repetitive flooding. **Flooding**	Mayor, Parks Department, Barberton Stormwater & Floodplain Administration	1/1/2015 – 12/31/2020 HMGP, Stormwater Fees, Stormwater Improvement Funds	PP	High / Medium	New
16	**Dam and Levee Failure** Prepare a Comprehensive Study of the Seven Major Dams, Numerous Small Dams, Levees and Stormwater Retention & Detention Ponds that lie in or upstream of Barberton. **Flooding / Dam & Levee Failure**	Barberton Safety and Service Director; Floodplain, Stormwater and Utility Department Managers; Engineering Department	1/1/2015 – 12/31/2020 Barberton General Fund; Utility and Stormwater Funds.	PP	High / Medium	New
17	**Tornado Warning System**, The original Barberton Tornado System of 5 sirens in the city is operating on out of date equipment and only 40% of the sirens. **Tornadoes**	Mayor, Barberton Police & Fire Departments, Safety Director	1/1/2015 – 12/31/2020 FEMA Funds, General Funds, Adjacent Communities	ES	High / Medium	New
18	**Provide for the Safety of the Residents of Barberton** Provide a notification system for closures and safety warnings. **Severe Storms / Tornadoes**	Mayor, Safety and Service Directors	1/1/2015 – 12/31/2020 Barberton General Fund, Safety Grants	PI	Medium / Low	New

Prevention. (PA); Property Protection. (PP); Emergency Services. (ES); Structural Projects. (SP); Public Information and Awareness. (PI)

Table D-1 City of Barberton Action Plan (Continued)

Priority	Activity Description / Hazard	Agency(s)	Target Date / Funding Source	Type	Benefit / Cost	Mitigation Action Status
19	**Maintain Road Circulation during Severe Storm** Develop means to ensure safe traffic flow during emergency situations. Install generators to provide a backup power supply for traffic lights at major intersections.	Barberton Safety and Service Directors, Street Superintendent	1/1/2015 – 12/31/2020	ES	Medium / Medium	New
	Severe Storms / Tornadoes		Barberton General Fund			
20	**Inventory Severe Storm Shelters in Barberton and Neighboring Communities** - Determine where additional Severe Storm Shelters can be located and constructed. -Update public community facilities to include severe weather action plans and designated tornado shelter areas.	Barberton Safety and Service Directors, Local Red Cross, Summit County EMA	1/1/2015 – 12/31/2020	ES	Low / Low	New
	Severe Storms / Tornadoes		Barberton General Fund			
21	**Improve Communication of Severe Weather Threats to All City Departments**	All Administration and Department Heads	1/1/2015 – 12/31/2020	PI	Low / Low	New
	Severe Storms / Tornadoes		Barberton General Fund			
22	**Minimize Damage to City Property and Right of Ways** Remove dead trees and trim trees/brush from roadways and city property to lessen damage from falling limbs and trees. Ensure proper road signage is visible and installed properly.	Safety and Service Directors, Street Superintendent	1/1/2015 – 12/31/2020	PA	Medium / Low	New
	Severe Storms / Tornadoes		Barberton General Fund			
23	**City Facilities Assess Vulnerability and Estimate Loss for a Severe Weather Hazard Event.**	City Administration & Department Heads	1/1/2015 – 12/31/2020	PA	High / Low	New
	Severe Storms / Tornadoes		Barberton General Fund			

Prevention. (PA); Property Protection. (PP); Emergency Services. (ES); Structural Projects. (SP); Public Information and Awareness. (PI)

Table D-1 City of Barberton Action Plan (Continued)

Priority	Activity Description / Hazard	Agency(s)	Target Date / Funding Source	Type	Benefit / Cost	Mitigation Action Status
24	**Contingency Plan For Severe Damage To Essential City Facilities** Prepare a Contingency Plan for Alternate Locations for Critical City Facilities including the City Municipal Building, Fire Stations, Water & Wastewater Plants. Pump Stations, Street and Utility Garages. **Severe Storms / Tornadoes**	Mayor, Safety and Service Directors, Fire and Police Chiefs, Street & Utility Department Heads	1/1/2015 – 12/31/2020 Barberton General Fund, Barberton Utility Fund	ES	High / Low	New
25	**Educate Residents to Type of Emergency Notifications** Inform residents of National Weather Service Terms and Definitions; Advisory, Watch, Warning, Hazardous Conditions. **Severe Storms / Tornadoes**	Barberton Safety and Service Directors,	1/1/2015 – 12/31/2020 Barberton General Fund	ES	Low / Low	New
26	**Groundwater Seepage** Numerous Areas of Barberton Experience High Groundwater Levels. Problems associated with these ground water levels include basement flooding, sanitary sewer backups, excessive sump water in streets without local storm sewers. **Severe Storms / Flooding**	Barberton Safety Director, Service Director, Engineering Department	1/1/2015 – 12/31/2020 Barberton General Fund	SP	Medium / Medium	New
27	**Subsidence from Organic Soils** An Area of North-Central Barberton has Experienced Settlement of Structures Due to Underlying Peat Deposits. These Areas Should Be Defined With Regards To Future Development in This Area. Inform Residents that Standard Homeowner Insurance Policies Do Not Cover Damage from Ground Movement **Subsidence**	Barberton Safety Director, Service Director, Engineering Department	1/1/2015 – 12/31/2020 Barberton General Fund	PI	Medium / Low	New

Prevention. (PA); Property Protection. (PP); Emergency Services. (ES); Structural Projects. (SP); Public Information and Awareness. (PI)

Table D-1 City of Barberton Action Plan (Continued)

Priority	Activity Description / Hazard	Agency(s)	Target Date / Funding Source	Type	Benefit / Cost	Mitigation Action Status
28	**Mine Subsidence** An Ohio Department of Natural Resources Mine Stabilization Program has Taken Place in SW Barberton. Some complaints are still being received. Further Study may be Required. Provide Information on Ohio Mine Subsidence Insurance **Subsidence**	Barberton Safety Director, Service Director, Engineering Department	1/1/2015 – 12/31/2020 *General Fund	PI	Low / Low	New
29	**Subsidence from Mine Spoils** An Area of the Near West Side of Barberton has Experienced Settlement of Structures and Sinkholes Due to Disposal of Spoils from Local Mining Activities. These Areas Should Be Defined With Regards To Future Development **Subsidence**	Barberton Safety Director, Service Director, Engineering Department	1/1/2015 – 12/31/2020 *General Fund	PA	Low / Low	New
30	**Prepare a Contingency Plan** for Alternate Locations for Critical City Facilities including the City Municipal Building, Fire Stations, Water & Wastewater Plants. Pump Stations, Street and Utility Garages. **Earthquakes**	Barberton Safety Director, Service Director, Engineering Department	1/1/2015 – 12/31/2020 *General Fund	PA	High / Low	New
31	**Barberton Has Many Unreinforced Masonry Buildings**. Implement a program to a) identify and b) minimize potential damage. **Earthquakes**	Barberton Safety Director, Service Director, Engineering Department	1/1/2015 – 12/31/2020 *General Fund	PA	Medium / Low	New
32	**Barberton has four major waterways** running through the city along with high groundwater levels and a variety of soil types. Conduct a study to determine potential liquefaction areas in the city. **Earthquakes**	Barberton Safety Director, Service Director, Engineering Department	1/1/2015 – 12/31/2020 *General Fund	PA	Medium / Medium	New
33	**Provide Information** to Residents on Earthquake Probabilities for the Barberton Area including Earthquake Insurance. **Earthquakes**	Barberton Safety Director, Service Director, Engineering Department	1/1/2015 – 12/31/2020 *General Fund	PI	Low / Low	New

Prevention. (PA); Property Protection. (PP); Emergency Services. (ES); Structural Projects. (SP); Public Information and Awareness. (PI)

Table D-1 City of Barberton Action Plan (Continued)

Priority	Activity Description / Hazard	Agency(s)	Target Date / Funding Source	Type	Benefit / Cost	Mitigation Action Status
34	**Provide for the Safety of the Residents of Barberton** Provide a notification system for closures and safety warnings. **Winter Storm**	Mayor, Safety and Service Directors	1/1/2015 – 12/31/2020 Barberton General Fund, Safety Grants	PI	Medium / Low	New
35	**Maintain Road Circulation during Winter Storm** Develop means to ensure safe traffic flow during emergency situations. Install generators to provide a backup power supply for traffic lights at major intersections. Have equipment available for emergency vehicles to access the City. Plan for sufficient at-the-ready personnel and equipment to operate a minimum of 48 hours. Plan for sufficient locations to place snow from plowing. Maintain records for potential FEMA Reimbursement for debris removal and damage access. **Winter Storm**	Safety and Service Directors Police and Fire Chiefs, Street Superintendent	1/1/2015 – 12/31/2020 Barberton General Fund	ES	Medium / Medium	New
36	**Flooding resulting from Ice Jams.** Monitor weather conditions and inspect potential ice jam locations as needed. **Winter Storm**	Barberton General Fund, Barberton Stormwater Fund	1/1/2015 – 12/31/2020 Barberton General Fund	PA	High / Medium	New
37	**Educate Residents to Type of Emergency Notifications** Inform residents of National Weather Service Terms and Definitions; Advisory, Watch, Warning, Snow Parking Ban, Hazardous Conditions. **Winter Storm**	Barberton General Fund	1/1/2015 – 12/31/2020 Barberton General Fund	PI	Medium / Low	New
38	**City Facilities** Assess Vulnerability and Estimate Damages and Losses for a Severe Winter Hazard Event **Winter Storm**	Barberton General Fund	1/1/2015 – 12/31/2020 Barberton General Fund	PA	Medium / Medium	New

Prevention. (PA); Property Protection. (PP); Emergency Services. (ES); Structural Projects. (SP); Public Information and Awareness. (PI)

Table D-1 City of Barberton Action Plan (Continued)

Priority	Activity Description / Hazard	Agency(s)	Target Date / Funding Source	Type	Benefit / Cost	Mitigation Action Status
39	**Minimize Damage to City Property and Right of Ways** Remove dead trees and trim trees/brush from roadways and city property to lessen damage from falling limbs and trees. Ensure proper road signage is visible and installed properly. **Winter Storm**	Barberton General Fund	1/1/2015 – 12/31/2020 Barberton General Fund	PA	Medium / Low	New
40	**Establish Guidelines** for Declaring a High Heat and Humidity Emergency **Extreme Temperatures (Heat)**	Barberton Safety Director, Service Director	1/1/2015 – 12/31/2020 Barberton General Fund	PI	Low / Low	New
41	**Establish Guidelines** for Declaring a Severe Cold Weather and Wind Chill Emergency **Extreme Temperatures (Cold)**	Barberton Safety Director, Service Director	1/1/2015 – 12/31/2020 Barberton General Fund	PI	Low / Low	New
42	**Inventory Shelters in Barberton and Neighboring Communities for Use in Extreme Weather Conditions** Determine the location and number of available facilities that could be used as shelter sites during emergency situations. **All Hazards**	Barberton Safety Director, Service Director, Local Red Cross Chapter	1/1/2015 – 12/31/2020 Barberton General Fund	PI	Medium / Medium	New
43	**Implement a Public Notification and Call Center for Residents Needing Shelters in Extreme Weather Events** **All Hazards**	Barberton Safety Director, Service Director	1/1/2015 – 12/31/2020 Barberton General Fund	PI	Medium / Low	New
44	**Prepare a Transportation Plan for Assisting in Moving Residents to Shelters** **All Hazards**	Barberton Safety Director, Service Director	1/1/2015 – 12/31/2020 Barberton General Fund	PI	Medium / Low	New

Prevention. (PA); Property Protection. (PP); Emergency Services. (ES); Structural Projects. (SP); Public Information and Awareness. (PI)

Table D-1 City of Barberton Action Plan (Continued)

Priority	Activity Description / Hazard	Agency(s)	Target Date / Funding Source	Type	Benefit / Cost	Mitigation Action Status
45	**Public Information** Inform residents of National Weather Service Terms and Definitions; Advisory, Watch, Warning, Heat – Humidity Index, Wind Chill, Hazardous Conditions **All Hazards**	Barberton Safety Director, Service Director	1/1/2015 – 12/31/2020 Barberton General Fund	PI	Low / Low	New
46	**Extreme Weather Conditions** -Maintain water capabilities as closely to normal operation as possible. -For Prolonged Droughts, Prepare a Water Use Plan and Priorities **Drought**	Safety Director, Service Director, Utility Director	1/1/2015 – 12/31/2020 Barberton General Fund	PI	Medium / Low	New

Prevention. (PA); Property Protection. (PP); Emergency Services. (ES); Structural Projects. (SP); Public Information and Awareness. (PI)

Federal Sources:

1) *Pre-disaster Mitigation Program: Federal Emergency Management Agency (FEMA)*: Through the Disaster Mitigation Act of 2000, Congress approved the creation of a national program to provide a funding mechanism that is not dependent on a Presidential disaster declaration. The Pre-Disaster Mitigation (PDM) Program provides funding to states and communities for cost-effective hazard mitigation activities that complement a comprehensive mitigation program, as well as reduce injuries, loss of life, and damage and destruction of property.

2) *Emergency Management Performance Grant*: *Federal Emergency Management Agency (FEMA):* The Emergency Management Performance Grant (EMPG) encourages the development of comprehensive emergency management at the State and local level in order to improve emergency management planning, preparedness, mitigation, response, and recovery capabilities. Funding is provided to the State, which can be used to educate people and protect lives and structures from natural and technological hazards.

3) *Public Assistance Grant Program: Federal Emergency Management Agency (FEMA):* The Public Assistance (PA) Grant Program provides supplemental assistance to states, local governments, and certain private non-profit organizations to alleviate sufferings and hardship resulting from major disasters or emergencies declared by the President. These grants allow state and local government to respond to disasters, recover from their impact, and mitigate impact from future disasters.

4) *Flood Mitigation Assistance Program*: *Federal Emergency Management Agency (FEMA):* FEMA's Flood Mitigation Assistance (FMA) Program provides funding to assist states and communities in implementing measures to reduce or eliminate the long-term risk of flood damage to buildings, manufactured homes, and other structures insurable under the National Flood Insurance Program (NFIP). FMA was created as part of the National Flood Insurance Reform Act of 1994 (42 U.S.C. 4101) with the goal of reducing or eliminating claims under the NFIP. FMA is a pre-disaster grant program, and is made available to states on an annual basis. This funding is exclusively available for mitigation planning and implementation of mitigation measures.

   The community must be a participant in NFIP and the project must be cost-effective, beneficial to the NFIP fund, and technically feasible. The project must conform to the minimum standards of the NFIP Floodplain Management Regulations, the applicant's Flood Mitigation Plan, and all applicable laws and regulations.

5) *Hazard Mitigation Grant Program: Federal Emergency Management Agency (FEMA):* The Hazard Mitigation Grant Program (HMGP) was created in November 1988 through Section 404 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act. The HMGP assists states and local communities in implementing long-term mitigation measures following a Presidential disaster declaration.

   A project must conform to the State's Hazard Mitigation Plan, provide a beneficial impact on the disaster area, meet environmental requirements, solve a problem independently, and be cost-effective.

6) *Community Development Block Grants: US Department of Housing and Urban Development*: The Community Development Block Grant (CDBG) program provides grants to local governments for community and economic development projects that primarily benefit low- and moderate-income people. The CDBG program also provides grants for post-disaster hazard mitigation and recovery following a Presidential disaster declaration. To be eligible for a CDBG, a community must have a population less than 50,000 (200,000 for counties) and be located within a Presidential disaster declaration area.

7) *Sustainable Development Assistance: Department of Energy*: A Sustainable Development Assistance team works with communities to help them define and implement sustainable development strategies as part of their comprehensive community planning efforts. The team provides technical assistance to disaster-affected communities as they plan for long-term recovery by introducing a wide array of environmental technologies and sustainable redevelopment planning practices.

8) *Emergency Watershed Protection: Department of Agriculture*: Natural Resources Conservation Service *(NRCS)*: The Emergency Watershed Protection (EWP) Program provides financial assistance to sponsors and individuals in implementing emergency measures to relieve imminent hazards to life and property created by a disaster. Activities include providing financial and technical assistance to remove debris from streams, protect destabilized stream banks, and purchase floodplain easements. The program is designed for the implementation of recovery measures. It is not necessary for a national emergency to be declared to be eligible for assistance.

9) *Emergency Relief Program (Transportation Infrastructure): Department of Transportation, Federal Highway Administration*: The Emergency Relief (ER) Program provides assistance for repair of Federal-aid roads. This funding is allocated to rebuild transportation facilities that are damaged extensively, causing a "disastrous impact" on transportation services. States must request ER funding in order to initiate this assistance program.

10) *United States Army Corps of Engineers*: Congress delegates to the United States Army Corps of Engineers (USACE) the authority and appropriations for projects through the Water Resources and Development Act (WRDA). Projects eligible for funding include the following: disaster response, water supply, shore protection, navigation, facilities design & construction, installation support, hydropower, recreation, flood damage reduction, environmental infrastructure, ecosystem restoration, master planning, regulatory projects, and the rehabilitation of flood control structures

<u>State Funding:</u>

1) *Section 208 Snagging and Clearing for Flood Control: United States Corps of Engineers*: USACE designs and constructs the project. Each project must be engineering feasible, complete within itself, and economically justified. The nonfederal sponsor must provide all lands, easements, and rights of way. Non-Federal sponsor pays all project costs in excess of the Federal limit of $500,000. Sponsor agrees to maintain the project.

2) *Hazard Mitigation Assistance Program: OEMA Agency:* Governments must be enrolled and in good standing with the NFIP. Eligible initiatives are eligible for projects

that include acquisition of insured structures and underlying real property for open space use. Provides up to 75% of project costs, 25% match required.

There are several sources of available funding for hazard mitigation projects. Those identified here, while they are significant, do not comprise all potential sources of funding. It should be noted that new programs can become available while existing programs can be modified or dropped. Many funds available are leveraged with “local” matching funds at various contribution percentages. Should any of the above funding sources be utilized, a detailed cost-benefit analysis should be completed prior to application. Diligence in keeping abreast of changes in funding opportunities will be necessary to institute hazard mitigation projects that take advantage of non-local funds.

Flood Mitigation Strategies – Proposed by Flood Action Committee

14TH, 15TH & 16TH STREETS NW

PROPOSED FLOOD MITIGATION STRATEGIES

- Remove Flood Prone Structures from the area.
  - This is preferred by the Ohio Emergency Management Agency (OEMA) & Federal Emergency Management Agency (FEMA)
    - Once OEMA /FEMA purchase the property and the structure is removed, the property must remain undeveloped.
    - Undeveloped means open space only.
    - Using the property for other flood control purposes such as levees, pump stations, retention ponds and rain garden are not allowed.
    - The City of Cuyahoga Falls received a special exemption to construct a stormwater feature on FEMA purchased lots.
  - Property purchased by the city or other entities may be used for any purpose that conforms to Barberton's Floodplain and Stormwater Ordinances.
- Flood Proof Structures in the Floodplain
  - Residential Structures
    - Elevate the structure above the designated flood level including mechanical and electrical components.
    - Can only be done if the benefit/cost (BC) ratio justifies this.
    - Residential structures cannot be flood-proofed in-place.
  - Commercial Structures in Floodplain
    - Can be purchased and demolished.
    - Can be elevated to above the designated flood level.
    - Can be flood-proofed with levees, flood doors, and pump systems.

- Install a Structural Flood Control
  - Levees, Pump stations, Flood Gates
    - Highly unlikely that funding can be obtained for this type of mitigation.
    - Very high initial cost and high maintenance costs.
- Reduce Stormwater Entering Wolf Creek in Barberton
  - Diversion of 24th & 25th NW Streets runoff into Hudson Run rather than Wolf Creek.
  - Storage of stormwater from Norton on Hillsdale Ave.
  - Rain Barrels & Rain Gardens.
- Increase Storage Capacity of Wolf Creek.
  - Enlarge Wolf Creek Floodplain from existing channel configuration.
    - Seiberling, BCDC, Wintrow, Alcoa, Midwest Rubber.
    - Joint purchase of floodplain in Norton.
  - Increase Wolf Creek Storage at the BCF Ball fields.

SOUTH BARBERTON FLOOD ZONE

FLOOD MITIGATION STRATEGIES

- Remove Flood Prone Structures from the area.
  - This is preferred by the OEMA. However, at this time, given the flood damages as defined by FEMA only a few structures appear eligible for this program.

    - Property purchased by the city or other entities may be used for any purpose that conforms to Barberton's Floodplain and Stormwater Ordinances.
- Flood Proof Structures in the Floodplain
    - Residential Structures
        - Elevate the structure above the designated flood level including mechanical and electrical components.
        - Can only be done if the benefit/cost (BC) ratio justifies this.
        - Residential structures cannot be flood proofed in-place.
        - City must have a Natural Hazards Mitigation Plan in place to be eligible for funding.
- Install a Structural Flood Control
    - Examine a flood control gate and pump system for this area.
        - Topography of this area appears to favor this type of system.
        - A single gate and a small pump station may keep costs low.
        - A nearby area appears suitable for a safe diversion of the floodwater.
        - Outside funding for this type of project is unknown.
- Reduce Stormwater Entering The Tuscarawas River in Barberton
    - Any storage of runoff in the city will benefit the South Barberton Area.
    - Rain Barrels & Rain Gardens.
- Increase Storage Capacity of The Tuscarawas River
    - A large undeveloped parcel of land within the floodplain and riparian area could be available for purchase.
    - This area, south of Snyder Ave. and west of Van Buren is presently owned by the Wheeling & Lake Erie Railroad.

31st STREET – HUDSON RUN FLOOD ZONE

FLOOD MITIGATION STRATEGIES

- Remove Flood Prone Structures from the area.
    - This is preferred by the OEMA. At the present time, no structure is eligible for a FEMA sponsored purchase.
    - Property purchased by the city or other entities may be used for any purpose that conforms to our Floodplain and Stormwater Ordinances.
- Flood Proof Structures in the Floodplain
    - Residential Structures
        - Elevate the structure above the designated flood level including mechanical and electrical components.
        - Can only be done if the benefit/cost (BC) ratio justifies this.
        - Residential structures cannot be flood proofed in-place.
        - City must have a Natural Hazards Mitigation Plan in place to be eligible for funding.

  Reduce Stormwater Entering Hudson Run
    - The city has been studying a plan for a constructed wetland in Edgewood Park. This would reduce inflow to Hudson Run from 25th to 27th Sts. NW.
    - Rain Barrels & Rain Gardens.
- Increase Storage Capacity of Hudson Run
    - A large undeveloped parcel of land within the floodplain west of 31st St. NW could be available for purchase.

MUD RUN – COVENTRY ROAD - EAGON STREET FLOOD ZONE

FLOOD MITIGATION STRATEGIES

- Remove Flood Prone Structures From The Area.
  - This is preferred by the OEMA. At the present time, no structure is eligible for a FEMA sponsored purchase.
  - Property purchased by the city or other entities may be used for any purpose that conforms to our Floodplain and Stormwater Ordinances.
  - Some of the industrial buildings lie within a portion of the floodway where debris and erosion can inflict additional damage to structures.
  - City must have a Natural Hazards Mitigation Plan in place to be eligible for funding
- Flood Proof Structures in the Floodplain
  - Residential Structures
    - Elevate the structure above the designated flood level including mechanical and electrical components.
    - Can only be done if the benefit/cost (BC) ratio justifies this.
    - Residential structures cannot be flood-proofed in-place.
    - Commercial and industrial building can be flood-proofed to minimize the effects of high water.
    - City must have a Natural Hazards Mitigation Plan in place to be eligible for funding
- Increase Storage Capacity of Mud Run
  - A low-lying area of Harter Park incurs shallow flooding from surface runoff during heavy rain events. Reconfiguring the park topography could allow Mud Run to overflow into the park.
  - Any improvements in the Mud Run drainage affect the entire Tuscarawas River in Barberton.

ROBINSON AVE. – EAST TUSCARAWAS AVE. FLOOD ZONE

FLOOD MITIGATION STRATEGIES

- Remove Flood Prone Structures from the area.
  - The City is in the process of purchasing an adjacent one-acre residential property. The structure that has previously flooded a number of times will be demolished.
- Flood Proof Structures in the Floodplain
  - Residential Structures
    - Elevate the structure above the designated flood level including mechanical and electrical components.
    - Residential structures cannot be flood-proofed in-place.
- Increase Storage Capacity of the Drainage Area
  - A study commissioned by the City in 2007 analyzed the retention pond and the surrounding drainage area. The report stated that the pond was capable of containing the design 100-year storm. However, the two storms that resulted in overtopping the pond significantly exceeded the design storm.
  - With the purchase of the adjacent property, the City plans to increase the storage capacity and configure the site to meet current EPA Standards for Water Quality.

    - In the 1980s, the downstream outlet from the retention pond was converted from an open waterway to an enclosed culvert. This change has resulted in a reduction in floodwater capacity.
    - The City has a utility corridor at E. Tuscarawas Ave. and State St. This also serves as a shallow overflow basin. However, the capacity is very limited and it can detrimentally affect nearby residences. A comprehensive plan covering all three of these features should be initiated. In 2011, the City prepared a grant application for the retention pond alone and this was rejected. We will be submitting a future grant application for design studies.
- Reduce Stormwater Entering The Tuscarawas River
    - The present storm sewers along Robinson Ave. discharge directly into the culvert downstream of the retention pond. Relocating these to the proposed increased storage area of the retention pond would reduce some stormwater from going directly to the Tuscarawas River during storm events.
    - Rain Barrels & Rain Gardens
        - The large lots and abundance of gardens in the immediate area, make this a prime candidate for inclusions of the stormwater reduction features.

2nd STREET SE – LAMBERTON AVE. FLOOD ZONE

FLOOD MITIGATION STRATEGIES

- Flood Proof Structures in the Floodplain
    - Apartment Complexes
        - Construct barrier systems to minimize flooding.
        - Outside funding is questionable.
        - Flood-proof where feasible.
- Increase Storage Capacity of the Drainage Area
    - The area requires a study to evaluate potential stormwater storage for this area.
    - Older commercial complexes were constructed prior to stormwater storage requirements and contribute greatly to the problem water runoff.

CITY OF BARBERTON NATURAL HAZARD MITIGATION PLAN
Mitigation Strategy
October 14, 2014

Community Name/Department **Barberton, Floodplain Administration** Contact Name **Alan Keltyka** Contact Phone No . **330-861-7299**

Mitigation Goals: **FLOODING**

1. Preventative Activities. Reduce risks through regulations including building codes, development outside of hazardous areas, and local planning or capital improvement projects.
2. Property Protection. Reduce exposure to hazards through building or parcel specific activities such as flood proofing, structure acquisition, or retrofitting.
3. Emergency Services. Reduce impacts through response and recovery activities that are implemented during a disaster.
4. Structural Projects. Minimize impacts through projects, such as detention basins, tornado shelters, tornado sirens, etc.
5. Public Information. Assist residents to prepare for risks and protective measures to better protect themselves and their property.

Item Number	Goal Number	Mitigation Action	Responsible Agency & Contact Person	Funding Source	Implementation Timeline	Estimated Benefits*	Estimated Costs*
1.	1.	Create a Flood Conservancy District to address the Barberton Flood Problems on a Watershed Basis.	Mayor	Community General Funds	The cities of Barberton and Norton along with Copley Township have prepared plans for the district. Formation of the district is anticipated within two years	High	High
2.	2.	Purchase flood prone properties on 14th St. NW, Wooster Rd. West to Shannon Ave. Eliminate street and utilities and create a green space floodwater storage area.	Mayor, Barberton Stormwater & Floodplain Administration	HMGP, Stormwater Fees, CBDG	In progress	Medium	Medium
3.	3.	Purchase infill properties in the South Barberton flood zone, create small floodwater storage basins.	Mayor, Planning Department, Barberton Stormwater & Floodplain Administration	Stormwater Fees	In progress. First basin in operation	Medium	Medium

4.	4.	Construct additional storm sewers and curbs to store additional stormwater in the South Barberton Stanley Ave. area.	Mayor, Barberton Stormwater & Floodplain Administration	Stormwater Fees, Infrastructure Reserve,	Design Plans are complete, Bid in 2014, construction in 2015.	Medium	Medium
5.	5.	Purchase flood prone properties on Arthur St. in the South Barberton area. Create a green space floodwater storage area.	Mayor, Barberton Stormwater & Floodplain Administration	HMGP, Stormwater Fees, CBDG	Properties are identified. At the present time, we are awaiting funding. Initial contact made with property owner.	Medium	Low
6.	6.	Residential construction in the South Barberton area prior to the July 2009 FEMA FIRM Map Revision was not in a 100 yr. Flood Zone. A number of post-1990 residences, now in the flood zone, include basements that are subject to flooding. First floor elevations are generally above the Base Flood Elevation. Initiate a program of filling in the basements and relocating the mechanicals to above the Base Flood Elevation.	Mayor, Barberton Stormwater & Floodplain Administration	HMGP, Stormwater Fees,	We have had initial discussions with some residents in the area. With funding and internal budgeting, anticipating program to begin in 2 to 4 years.	Medium	Medium
7.	7.	Construct a Flood Gate and Pump System for the South Barberton Stanley Ave. area to minimize storm sewer backups and subsequent flooding of the area.	Mayor, Barberton Stormwater & Floodplain Administration	HMGP, Stormwater Fees,	Consultant has prepared a project feasibility study. Begin design 2014-2015. Examining City access to existing lake.	Medium	Medium

8.	8.	Barberton owns 16 acres of land for the City water well field at the confluence of Wolf and Pigeon Creeks. City is studying the potential for creating a flood storage basin to reduce flooding for the 14th St. NW and South Barberton flood zones.	Mayor, Utilities Department, Barberton Stormwater & Floodplain Administration	Flood Conservancy District. Stormwater Fees, Utility Dept.	Consultant has prepared a preliminary feasibility study. City does not have available funding at this time. Will examine project for an area wide flood control improvement.	High	High
9.	9.	Barberton has a retention basin on the east side that was constructed in the 1970s. Sedimentation has reduced the capacity of the basin and recent severe storms have caused moderate to severe flooding of five residences. The City has purchased one residence adjacent to the basin, razed the structure and is planning to enlarge the existing stormwater storage area. Future plans call for an increase in basin storage. As an alternative the City is examining the purchase of the remaining four flood distressed properties.	Mayor, Utilities Department, Barberton Stormwater & Floodplain Administration	Stormwater Fees, Flood Conservancy District	A consultant has been retained for the project. Design in progress. Initial Construction planned for 2015.	Medium	Medium
10.	10.	Mud Run, on the City's NE side has experienced significant flooding over the past six years. Flooding affects an industrial section of the City. One building that is in the floodplain and floodway is being examined for purchase and removal.	Mayor, Utilities Department, Barberton Stormwater & Floodplain Administration	HMGP, Stormwater Fees,	Concept Project, Properties are identified. At the present time, we are awaiting funding.	Medium	Medium

11.	11.	Mud Run, on the City's NE side has experienced significant flooding over the past six years. Flooding affects an industrial section of the City. Barberton's Harter Park, north of the industrial area, has a large open area adjacent to Mud Run with a potential for floodwater storage.	Mayor, Parks Department, Barberton Stormwater & Floodplain Administration	Stormwater Fees	Concept Project, Anticipating study in 2015-2016	Medium	Low
12.	12.	Edgewood Park on Barberton's west side has a 2-acre low-lying area that remains wet throughout the year. This area has the potential for stormwater storage by means of a constructed wetlands. This potential project would store stormwater from 26th and 27th Sts. NW and also diverted stormwater from the 25th St. storm sewer system.	Mayor, Parks Department, Barberton Stormwater & Floodplain Administration	EPA 319 Funds, Stormwater Fees, Flood Conservancy District	Concept Project. Some preliminary work has been performed in conjunction with other area projects. High priority area dependent on partial outside funding sources.	Medium	Low
13.	13.	The Trucin Farm area of southeast Barberton has over 50 acres of wetlands that are classified as Category 1, 2 & 3. The site also contains commercially developable sites. The area has the potential for additional stormwater storage by means of a constructed wetlands for Class 1 & 2 Mitigation Projects. This potential project would store stormwater from the Austin Heights area that flows into the South Barberton Flood Zone.	Mayor, Barberton Community Development Corporation, Barberton Stormwater & Floodplain Administration	EPA 319 Funds, Stormwater Fees, Flood Conservancy District	Concept Project. Initial site work done in conjunction with a commercial project that is suspended... Awaiting funding source to continue.	Medium	Medium
14.	14.	Flood Warning System. – Installation of water level monitors at two floodwater storage basins. -Upper Tuscarawas River/Wolf Creek Stream Gauges. -Resident notification system. -Combine system with the City of Norton and Copley Township.	Mayor, Barberton Police & Fire Departments, Safety Director, Barberton Stormwater & Floodplain Administration	FEMA Funds, US Geological Survey Stormwater Fees, Flood Conservancy District, Adjacent Communities	Barberton, the City of Norton and Copley Township began operation of a new High Tech Joint Emergency Dispatch Facility in 2014. System plan needs to be developed.	High	Medium

15.	15.	Hudson Run, on City's west side experiences moderate flooding for two apartment complexes and eight residences. The city is examining obtaining vacant floodplain property for additional flood improvements. Also, low lying residential property subject to repetitive flooding.	Mayor, Parks Department, Barberton Stormwater & Floodplain Administration	HMGP, Stormwater Fees, Stormwater Improvement Funds	Concept Project. Initial discussions are in progress for obtaining one section of open space... Consultant is preparing cost estimate for feasibility of project.	High	Medium
16.	16.	Dam and Levee Failure Prepare a Comprehensive Study of the Seven Major Dams, Numerous Small Dams, Levees and Stormwater Retention & Detention Ponds that lie in or upstream of Barberton.	Barberton Safety and Service Director, Floodplain, Stormwater and Utility Department Managers, Engineering Department	Barberton General Fund; Utility and Stormwater Funds.	Individual studies have been completed for some dams. No immediate plans for a complete study.	High	Medium

t Rank Each Mitigation Action Higher = **1** Lower = **5**

[Type text]

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Less than $100,000 = Low
$100,000 - $500,000 = Medium
More than $500,000 = High

POTENTIAL STORM/FLOOD WATER STORAGE AREA

Barberton Has Purchased

Potential Purchase Area

Potential Lease/Purchase Area

CITY OF BARBERTON NATURAL HAZARD MITIGATION PLAN
Mitigation Strategy
October 14, 2014

Community Name/Department **Barberton Service Department** Contact Name **Michael Vinay** Contact Phone No. **330-848-6716**

Mitigation Goals for: **SEVERE STORMS-Thunder Storms, Lightning, Wind Storms, Tornados**

1. Preventative Activities. Reduce risks through regulations including building codes, development outside of hazardous areas, and local planning or capital improvement projects.
2. Property Protection. Reduce exposure to hazards through building or parcel specific activities such as flood proofing, structure acquisition, or retrofitting.
3. Emergency Services. Reduce impacts through response and recovery activities that are implemented during a disaster.
4. Structural Projects. Minimize impacts through projects, such as detention basins, tornado shelters, tornado sirens, etc.
5. Public Information. Assist residents to prepare for risks and protective measures to better protect themselves and their property.

Item Number	Goal Number	Mitigation Action	Responsible Agency & Contact Person	Funding Source	Implementation Timeline	Estimated Benefits*	Estimated Costs*
1.	1.	**Provide for the Safety of the Residents of Barberton** Provide a notification system for closures and safety warnings.	Mayor, Safety and Service Directors	Barberton General Fund, Safety Grants	Barberton has begun instituting community notification through various media systems. The City is continuing to examine additional methods.	Medium	Low
2.	2.	**Maintain Road Circulation Severe Storm** Develop means to ensure safe traffic flow during emergency situations. Install generators to provide a backup power supply for traffic lights at major intersections.	Barberton Safety and Service Directors, Street Superintendent	Barberton General Fund	Barberton Departments have individual policies for severe storm conditions	Medium	Medium

3.	3.	**Inventory Severe Storm Shelters in Barberton and Neighboring Communities** - Determine where additional Severe Storm Shelters can be located and constructed. -Update public community facilities to include severe weather action plans and designated tornado shelter areas.	Barberton Safety and Service Directors, Local Red Cross, Summit County EMA	Barberton General Fund,	The present listing of locations is with various departments and agencies. These will be incorporated into the City Disaster Plan	Low	Low
4.	4.	**Improve Communication of Severe Weather Threats to All City Departments**	All Administration and Department Heads	Barberton General Fund,	Communication of weather threats presently comes from various sources. A single source will be needed for the updated City Disaster Plan.	Low	Low
5.	5.	**Minimize Damage to City Property and Right of Ways** Remove dead trees and trim trees/brush from roadways and city property to lessen damage from falling limbs and trees. Ensure proper road signage is visible and installed properly.	Safety and Service Directors, Street Superintendent.	Barberton General Fund.	This work under this item is carried out on an as needed basis. There is no specific mitigation strategy for this item at present.	Medium	Low
6.	6.	**City Facilities** **Assess Vulnerability and Estimate Loss for a Severe Weather Hazard Event.**	City Administration & Department Heads	Barberton General Fund.	No present schedule for this item.	High	Low
7.	7.	**Contingency Plan For Severe Damage To Essential City Facilities** Prepare a Contingency Plan for Alternate Locations for Critical City Facilities including the City Municipal Building, Fire Stations, Water & Wastewater Plants. Pump Stations, Street and Utility Garages.	Mayor, Safety and Service Directors, Fire and Police Chiefs, Street & Utility Department Heads	Barberton General Fund, Barberton Utility Fund	Various departments have individual contingency plans. The updated Disaster Plan should incorporate those plans into an all City plan.	High	Low

8.	8.	**Educate Residents to Type of Emergency Notifications** Inform residents of National Weather Service Terms and Definitions; Advisory, Watch, Warning, Hazardous Conditions.	Barberton Safety and Service Directors,	Barberton General Fund.	Evaluate efficient methods of disseminating information to the public and incorporate into updated Barberton Disaster Plan.	Low	Low

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CITY OF BARBERTON NATURAL HAZARD MITIGATION PLAN

Mitigation Strategy

October 14, 2014

Community Name/Department **Barberton, Service Department** Contact Name **Michael Vinay** Contact Phone No. **330-848-6716**

Mitigation Goals: **Ground Movement Natural Hazard Mitigation Plan**

1. Preventative Activities. Reduce risks through regulations including building codes, development outside of hazardous areas, and local planning or capital improvement projects.
2. Property Protection. Reduce exposure to hazards through building or parcel specific activities such as flood proofing, structure acquisition, or retrofitting.
3. Emergency Services. Reduce impacts through response and recovery activities that are implemented during a disaster.
4. Structural Projects. Minimize impacts through projects, such as detention basins, tornado shelters, tornado sirens, etc.
5. Public Information. Assist residents to prepare for risks and protective measures to better protect themselves and their property.

Item Number	Goal Number	Mitigation Action	Responsible Agency & Contact Person	Funding Source	Implementation Timeline	Estimated Benefits*	Estimated Costs*
1.	1.	**Earthquakes** Prepare a Contingency Plan for Alternate Locations for Critical City Facilities including the City Municipal Building, Fire Stations, Water & Wastewater Plants. Pump Stations, Street and Utility Garages.	Mayor Safety Director, Service Director, Fire Chief, Police Chief, Street & Utility Department Heads	Barberton General Fund,	Various departments have individual contingency plans. The updated Disaster Plan should incorporate those plans into an all City plan.	High	Low
2.	2.	**Earthquakes** Barberton Has Many Unreinforced Masonry Buildings. Implement a program to a) identify and b) minimize potential damage.	Barberton Safety Director, Service Director, Engineering Department	Barberton General Fund,	No immediate plans for a study	Medium	Low

3.	3.	**Earthquakes** Barberton has four major waterways running through the city along with high groundwater levels and a variety of soil types. Conduct a study to determine potential liquefaction areas in the city.	Barberton Safety Director, Service Director, Engineering Department	Barberton General Fund,	No immediate plans for a study	Medium	Medium
4.	4.	**Subsidence from Organic Soils** An Area of North-Central Barberton has Experienced Settlement of Structures Due to Underlying Peat Deposits. These Areas Should Be Defined With Regards To Future Development in This Area. Inform Residents that Standard Homeowner Insurance Policies Do Not Cover Damage from Ground Movement.	Barberton Safety Director, Service Director, Engineering Department	Barberton General Fund,	No immediate plans for a study	Medium	Medium
		Groundwater Numerous Areas of Barberton Experience High Groundwater Levels. Problems associated with these ground water levels include basement flooding, sanitary sewer backups, excessive sump water in streets without local storm sewers.	Barberton Safety Director, Service Director, Engineering Department	Barberton General Fund,	No immediate plans for a study	Medium	Medium
6	6	**Mine Subsidence** An Ohio Department of Natural Resources Mine Stabilization Program has Taken Place in SW Barberton. Some complaints are still being received. Further Study may be Required. Provide Information on Ohio Mine Subsidence Insurance.	Barberton Safety Director, Service Director, Engineering Department	Barberton General Fund	No immediate plans for a study.	Low	Low

7	7	**Subsidence from Mine Spoils** An Area of the Near West Side of Barberton has Experienced Settlement of Structures and Sinkholes Due to Disposal of Spoils from Local Mining Activities. These Areas Should Be Defined With Regards To Future Development	Barberton Safety Director, Service Director, Engineering Department	Barberton General Fund,	Additional research is needed to determine the size of the problem area.	Low	Low
8	8	**Earthquakes** Provide Information to Residents on Earthquake Probabilities for the Barberton Area including Earthquake Insurance.	Barberton Safety Director, Service Director, Engineering Department	Barberton General Fund,	No immediate plans for an informational meeting.	Low	Low

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CITY OF BARBERTON NATURAL HAZARD MITIGATION PLAN
Mitigation Strategy
October 14, 2014

Community Name/Department **Barberton Service Department** Contact Name **Michael Vinay** Contact Phone No**.** **330-848-6716**

Mitigation Goals for: **WINTER STORMS, Blizzards, Ice Storms, Heavy Snowfalls**

1. Preventative Activities. Reduce risks through regulations including building codes, development outside of hazardous areas, and local planning or capital improvement projects.
2. Property Protection. Reduce exposure to hazards through building or parcel specific activities such as flood proofing, structure acquisition, or retrofitting.
3. Emergency Services. Reduce impacts through response and recovery activities that are implemented during a disaster.
4. Structural Projects. Minimize impacts through projects, such as detention basins, tornado shelters, tornado sirens, etc.
5. Public Information. Assist residents to prepare for risks and protective measures to better protect themselves and their property.

Item Number	Goal Number	Mitigation Action	Responsible Agency & Contact Person	Funding Source	Implementation Timeline	Estimated Benefits*	Estimated Costs*
1.	1.	**Provide for the Safety of the Residents of Barberton** Provide a notification system for closures and safety warnings.	Mayor, Safety and Service Directors	Barberton General Fund, Safety Grants	Barberton has begun instituting community notification through various media systems. The City is continuing to examine additional methods.	Medium	Low
2.	2.	**Maintain Road Circulation Winter Storm** Develop means to ensure safe traffic flow during emergency situations. Install generators to provide a backup power supply for traffic lights at major intersections.	Safety and Service Directors Police and Fire Chiefs, Street Superintendent	Barberton General Fund	Barberton Departments have individual policies for winter storm conditions.	Medium	Medium

3.	3.	**Maintain Road Circulation Severe Winter Storms, Blizzards, Ice Storms**. Have equipment available for emergency vehicles to access the City. Plan for sufficient at-the-ready personnel and equipment to operate a minimum of 48 hours. Plan for sufficient locations to place snow from plowing. Maintain records for potential FEMA Reimbursement for debris removal and damage access.	Safety and Service Directors Police and Fire Chiefs, Street and Utility Department Superintendents	Barberton General Fund,	Barberton Departments have individual policies for winter storm conditions. The City will be integrating those policies in updating it's Disaster Plan Manual for severe winter storms.	High	Medium
4.	4.	**Flooding resulting from Ice Jams.** Monitor weather conditions and inspect potential ice jam locations as needed.	Safety and Service Directors Stormwater Manager, Street Superintendent	Barberton General Fund, Barberton Stormwater Fund	Preparing Procedure for Monitoring Potential Ice Jam Conditions	Medium	Low
5.	5.	**Educate Residents to Type of Emergency Notifications** Inform residents of National Weather Service Terms and Definitions; Advisory, Watch, Warning, Snow Parking Ban, Hazardous Conditions.	Safety and Service Directors	Barberton General Fund	Evaluate efficient methods of disseminating information to the public and incorporate into updated Barberton Disaster Plan.	Low	Low
6.	6.	**City Facilities Assess Vulnerability and Estimate Damages and Losses for a Severe Winter Hazard Event.**	City Administration & Department Heads	Barberton General Fund	No present schedule for this item.	High	Low
7.	7.	**Minimize Damage to City Property and Right of Ways** Remove dead trees and trim trees/brush from roadways and city property to lessen damage from falling limbs and trees. Ensure proper road signage is visible and installed properly.	Safety and Service Directors, Street Superintendent	Barberton General Fund.	This work under this item is carried out on an as needed basis. There is no specific mitigation strategy for this item at present.	Medium	Low

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CITY OF BARBERTON NATURAL HAZARD MITIGATION PLAN
Mitigation Strategy
October 14, 2014

Community Name/Department **Barberton Service Department** Contact Name **Michael Vinay** Contact Phone No. **330-848-6716**

Mitigation Goals for: **NON-STORM HAZARDOUS CLIMATIC CONDITIONS**

1. Preventative Activities. Reduce risks through regulations including building codes, development outside of hazardous areas, and local planning or capital improvement projects.
2. Property Protection. Reduce exposure to hazards through building or parcel specific activities such as flood proofing, structure acquisition, or retrofitting.
3. Emergency Services. Reduce impacts through response and recovery activities that are implemented during a disaster.
4. Structural Projects. Minimize impacts through projects, such as detention basins, tornado shelters, tornado sirens, etc.
5. Public Information. Assist residents to prepare for risks and protective measures to better protect themselves and their property.

Item Number	Goal Number	Mitigation Action	Responsible Agency & Contact Person	Funding Source	Implementation Timeline	Estimated Benefits*	Estimated Costs*
1.	1.	**Extreme Temperatures (Heat)** Establish Guidelines for Declaring a High Heat and Humidity Emergency.	Barberton Safety Director, Service Director	Barberton General Fund	Include in the next update to the City Disaster Plan.	Low	Low
2.	2.	**Extreme Temperatures (Cold)** Establish Guidelines for Declaring a Severe Cold Weather and Wind Chill Emergency	Barberton Safety Director, Service Director	Barberton General Fund	Include in the next update to the City Disaster Plan.	Low	Low
3.	3.	**Inventory Shelters in Barberton and Neighboring Communities for Use in Extreme Weather Conditions** Determine the location and number of available facilities that could be used as shelter sites during emergency situations.	Barberton Safety Director, Service Director, Local Red Cross Chapter	Barberton General Fund,	No present schedule for this item	Medium	Medium
4.	4.	**Implement a Public Notification and Call Center for Residents Needing Shelters in Extreme Weather Events**	Barberton Safety Director, Service Director	Barberton General Fund,	No present schedule for this item	Medium	Low

5.	5.	**Prepare A Transportation Plan for Assisting in Moving Residents to Shelters**	Barberton Safety Director, Service Director	Barberton General Fund.	No present schedule for this item	Medium	Low
6.	6.	**Public Information** Inform residents of National Weather Service Terms and Definitions; Advisory, Watch, Warning, Heat – Humidity Index, Wind Chill, Hazardous Conditions	Barberton Safety Director, Service Director	Barberton General Fund	Barberton has begun instituting community notification through various media systems. The City is continuing to examine additional methods.	Low	Low
7.	7.	**Extreme Weather Conditions Drought** -Maintain water capabilities as closely to normal operation as possible. -For Prolonged Droughts, Prepare a Water Use Plan and Priorities	Safety Director, Service Director, Utility Director	Barberton General Fund.	Contingency and Emergency Operations Plan for Water Plant Updated Yearly	Medium	Low

t Rank Each Mitigation Action Higher = **1** Lower = **5**

[Type text]

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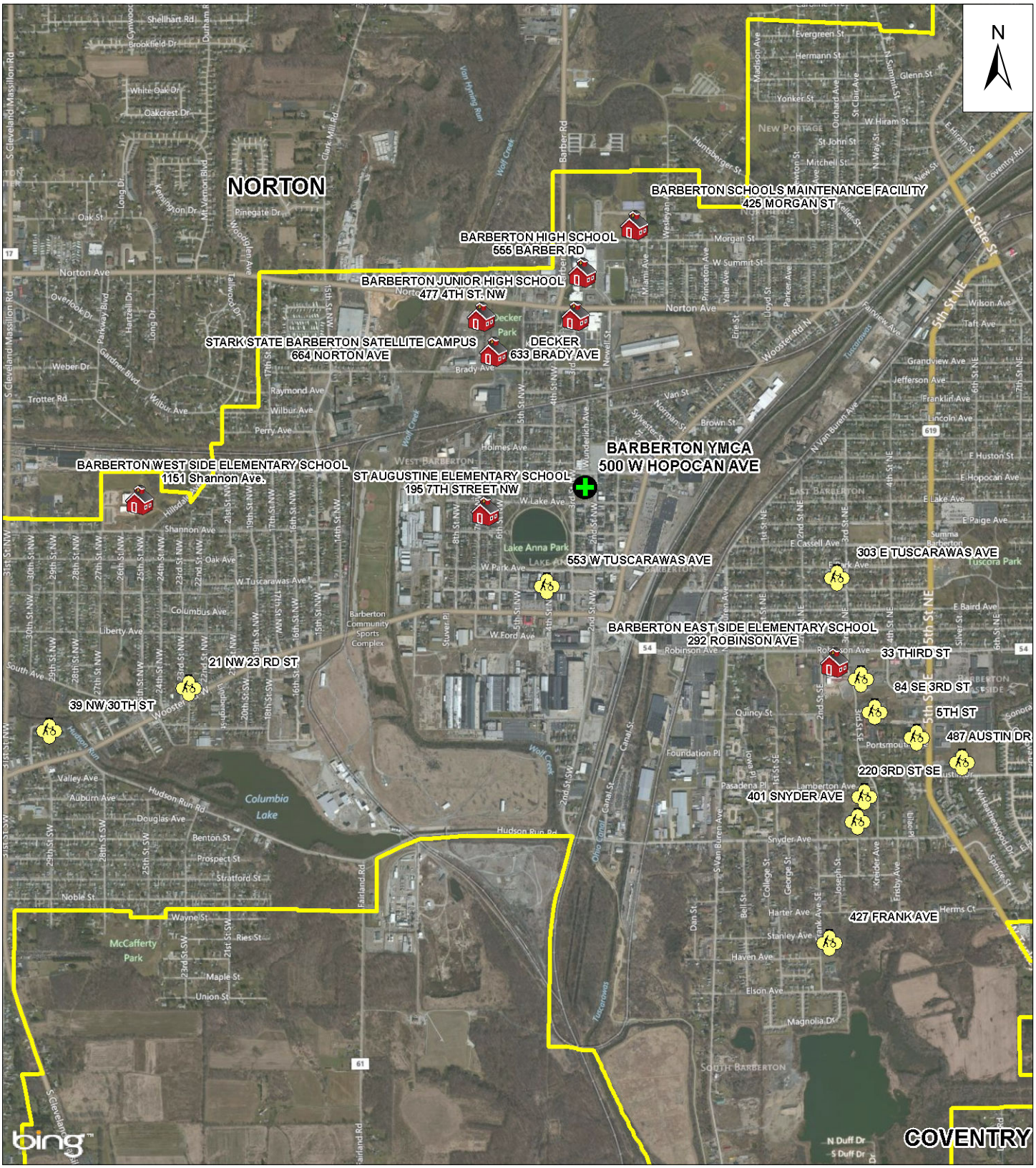
Appendix E

Critical Facilities



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data

Stantec

Legend

- Community Center
- Senior Citizen Housing
- School Facilities

Jurisdictions

- Other Jurisdictions
- City of Barberton

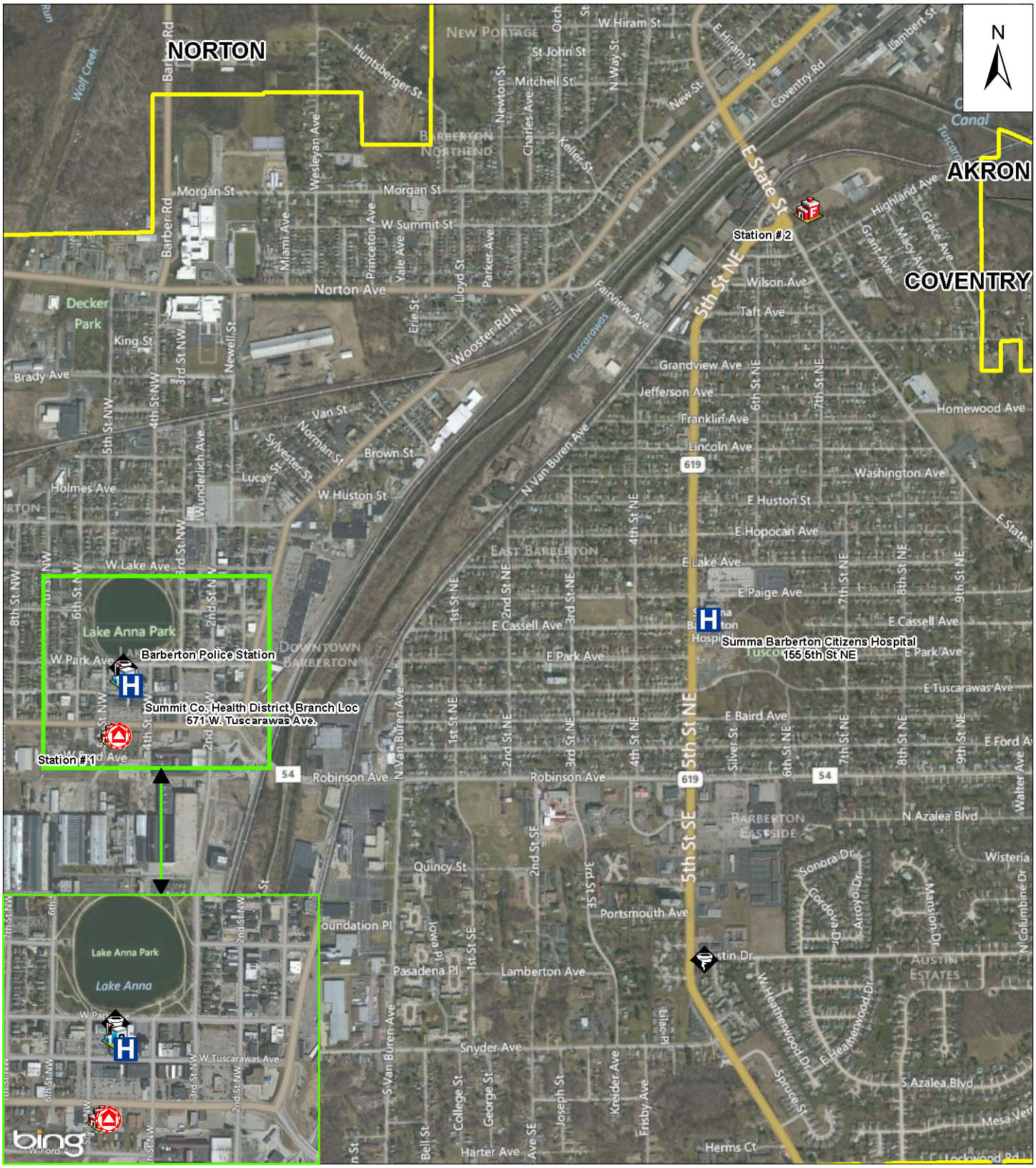
0 460
Feet
1 inch equals 2,000 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix E

February 2015

Title
Critical Facilities Community



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data

Stantec

Legend

- EOC Facilities
- FireStationFacilities
- Medical Care Facilities
- Police Station Facilities
- Warning Sirens

Jurisdictions
- Other Jurisdictions
- City of Barberton

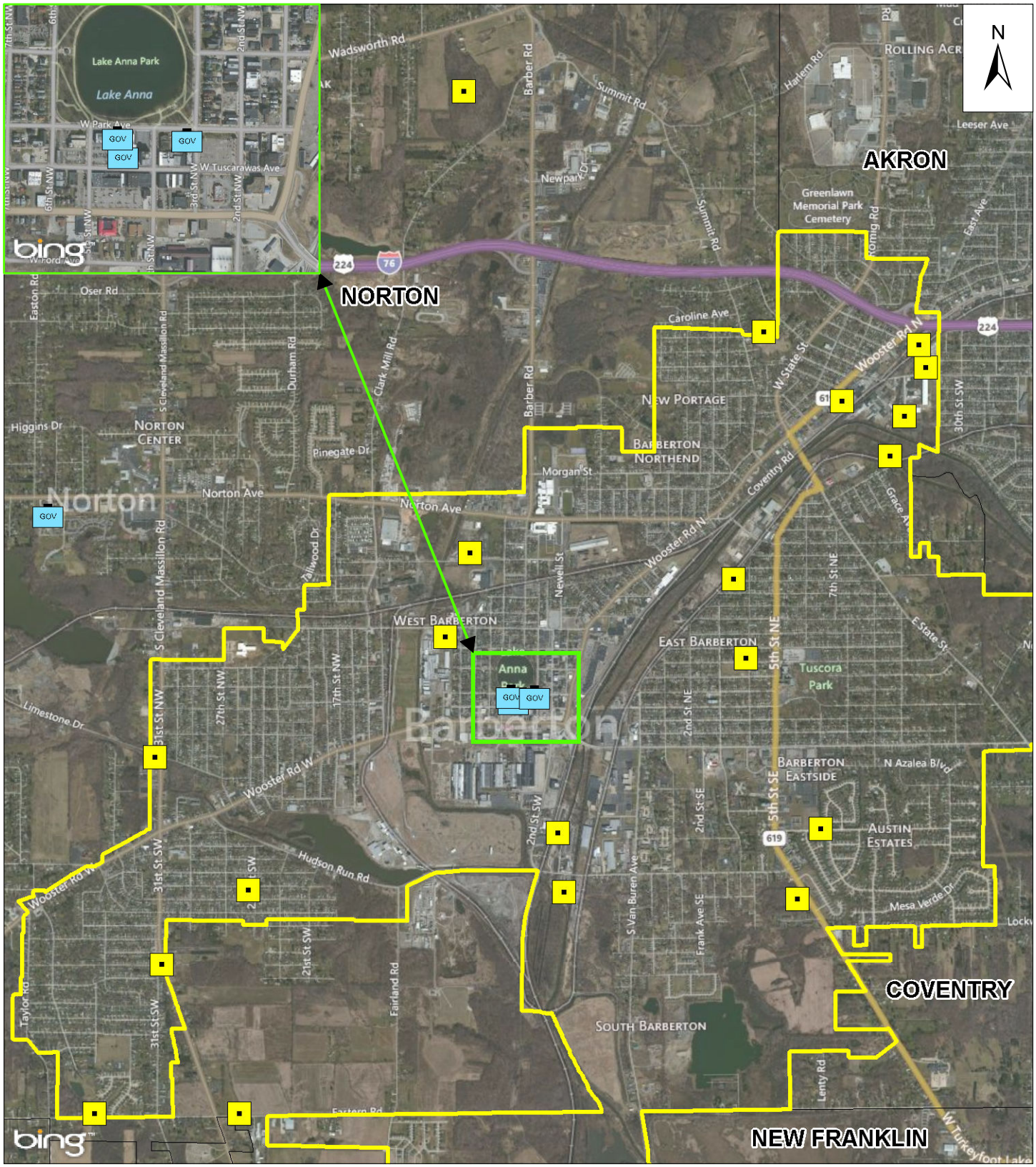
0 325 Feet
1 inch equals 1,400 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix E

February 2015

Title
Critical Facilities Emergency



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data

Stantec

Legend

- GOV Government
- Utilities

Jurisdictions

- Other Jurisdictions
- City of Barberton

0 700 Feet

1 inch equals 3,000 feet

City of Barberton Multi-Hazard Mitigation Plan

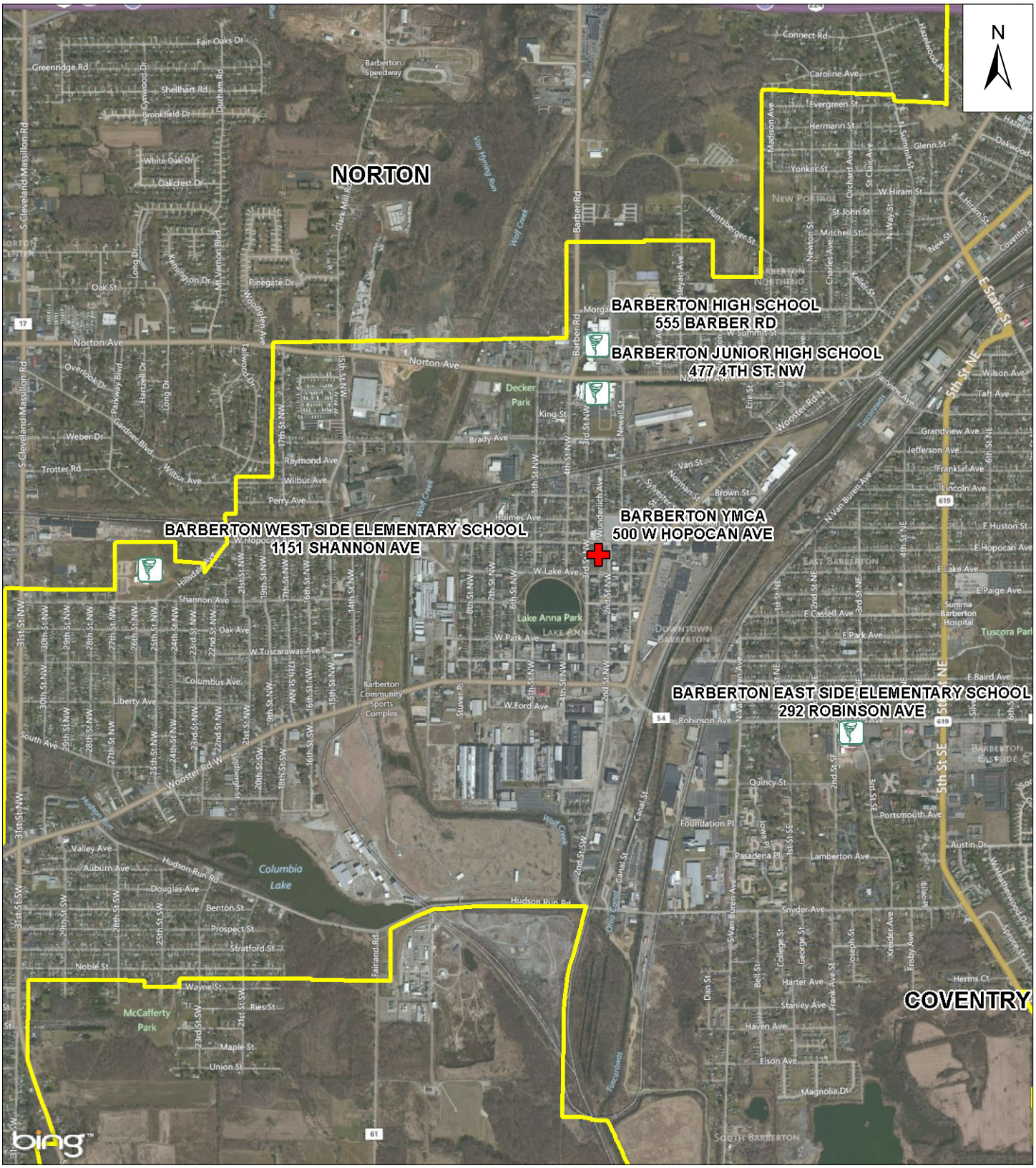
Attachment

Appendix E

February 2015

Title

Critical Facilities Government / Utilities



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data

Stantec

Legend

- Red Cross Shelters
- Tornado Shelters

Jurisdictions

- Other Jurisdictions
- City of Barberton

0 460
Feet
1 inch equals 2,000 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix E

February 2015

Title
Critical Facilities Shelters

Appendix F

Hazard Information

FLOODING

City of Barberton, Ohio

*Overview-*Flooding is the most frequent and costly natural hazard in the State of Ohio. The periodic flooding of land adjacent to rivers and streams is a hazard to all communities. Flooding results from excessive amounts of precipitation over a given area. This causes the flow of water to exceed capacity within the stream channel and overflow. Two common types of flooding are flash and general flooding. Flash flooding events occur within minutes or hours of heavy amounts of rainfall, from a dam or levee failure, water ponding due to insufficient drainage/storm sewer system, or from a sudden release of water held by an ice jam. They occur quickly and with little warning. General floods are longer-term events and may last for several days. In the City of Barberton, floods along the Tuscarawas River and its tributaries are of frequent occurrence. The Tuscarawas River has been known to flood multiple times a year. Wolf Creek, Mud Run, and Hudson Run have all caused considerable damages to buildings and infrastructure within the city.

*Risks-*Flood risk doesn't just occur around rivers and streams. Basements can become susceptible to flooding when the soil around your property becomes saturated with water, seeping into your basement foundation. Costly flood damage can happen in as little as just one inch of water. Depending on the flooding location, depths and velocities can vary dramatically. High-risk flood areas have at least a 1 in 4 chance of flooding during a 30-year mortgage. Expressing flood frequency or probability is the annual chance of the occurrence, or the percentage of the probability of flooding each year. For example, a 100-year flood has a one-percent annual chance of occurring (1 in 100 chance per year), whereas a 50-year flood has a two-percent annual chance of occurring (1 in 50 chance per year).

Probability of flooding

Return period	AEP	In any 1 year period	In any 10 year period	In any 30 year period	In any 70 year period
1 in 50 year	2%	1 chance in 50	1 chance in 5.5 (18%)	1 chance in 2.2 (45%)	1 chance in 1.3 (76%)
1 in 100 year	1%	1 chance in 100	1 chance in 10 (10%)	1 chance in 4 (26%)	1 chance in 2 (51%)
1 in 200 year	0.5%	1 chance in 200	1 chance in 20 (5%)	1 chance in 7 (14%)	1 chance in 3.3 (30%)
1 in 500 year	0.2%	1 chance in 500	1 chance in 50 (2%)	1 chance in 17 (6%)	1 chance in 7.7 (13%)

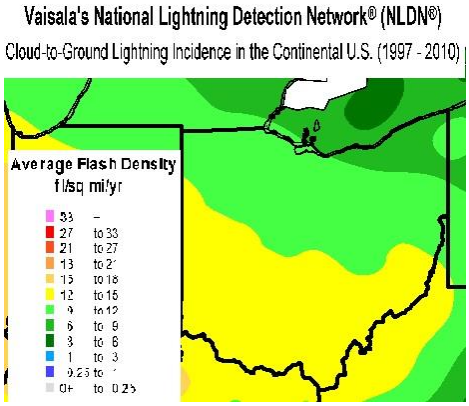
*Protection-*Understanding the extent of flooding in your community helps to decide where communities should prioritize mitigation activities. Communities should consult their current FEMA Flood Insurance Rate Map to identify any high risk areas. Anyone can view this information from the FEMA Map Service Center. Flood damage is not covered under any homeowner's policy. It would be recommended that you consult a licensed insurance agent to purchase flood insurance if your property is located in or around a floodplain. If a flood should happen in your area, determine a safe evacuation route in cases you need to move to higher ground. Communities need to assess critical facilities to make sure that these structures have as little vulnerability to flooding as possible. Any new construction should be built out of any floodplain.

Data Sources: 1) *https://msc.fema.gov* 2) *http://ema.ohio.gov/*

SEVERE STORMS

City of Barberton, Ohio

*Overview-*Severe storms refer to a broad range of meteorological activity that has the serious threat of causing serious damage and the loss of life. The type of severe storms communities experience can vary from region to region. However, thunderstorms are the most common throughout Illinois which often bring lightning and hail. These storms can be unpredictable and develop fast. Thunderstorms can typically be 15 miles in diameter and produce heavy rains anywhere from 30 minutes to an hour. Thunderstorms are capable of producing heavy winds causing serious damage similar to a tornado. These storms can also carry lightning which is a discharge of electrical energy resulting from the buildup of positive and negative charges within a thunderstorm. A bolt of lightning can reach temperatures approaching 50,000°F. This rapid heating and cooling of the surrounding air causes the thunder which often accompanies lightning strikes. Hail can also be a product of these severe storms. Hail starts to form due to the rapid rising of warm air and the subsequent cooling of the air mass. Frozen droplets gradually accumulate until they develop to a sufficient weight and fall as precipitation. Most hail is small, usually less than two inches in diameter but can be as big as softballs.



*Risks-*Lightning strikes occur in very small localized areas. Lightning occurs randomly, therefore it is impossible to accurately predict where and at what frequency it will strike. Only about 10% of people who are struck by lightning are killed. Most lightning deaths and injuries occur when people are caught outside during summer afternoons and evenings especially when they have no shelter available. Lightning can cause wildfires, fires to structures, damage to electrical equipment and infrastructure, and business disruption. Because the lightning hazard does not have a geographically-definable boundary, all people, structures, critical facilities, infrastructure, and other important assets in the community have the potential to be struck. Storms that produce even small-sized hail can destroy crops by slicing plant leaves to shreds in only a few minutes. Hailstones can dent vehicles, break windows and windshields, and damage roofs and building siding. Just like lightning, the hail hazard does not have a geographically-definable boundary, all people, structures, crops, commercial and residential centers, and other important assets in the community have the potential to be impacted.

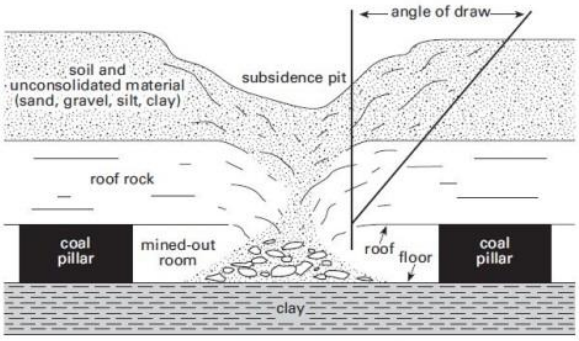
*Protection-*When you're outdoors, watch the sky for signs of approaching thunderstorms. The signs of rain or the darkening of skies can be an indication of an approaching storm. Tune into radio, television, or internet as media types broadcast severe storm alerts. When severe storms approach take shelter immediately, try to get indoors. If you cannot get inside, move from higher to lower elevations. Avoid large open spaces where you are taller than anything else around you. If hail starts to form, stay away from windows and skylights. Reframe from using electronics and driving until the storm has passed.

Data Sources: 1) *http://ema.ohio.gov/*2) *http://www.fema.gov*

SUBSIDENCE (Underground Mining)

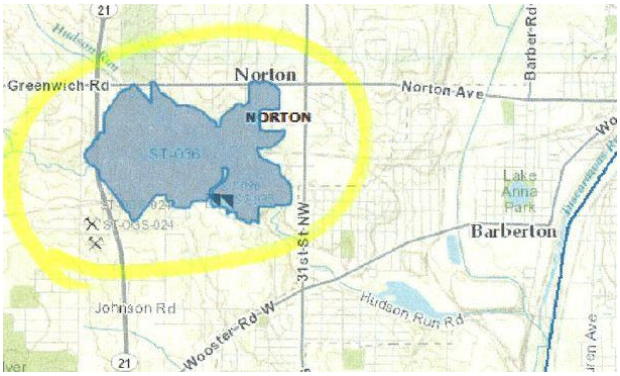
City of Barberton, Ohio

*Overview-*Subsidence related to underground mining, is described as the lowering of the earth's surface due to collapse of bedrock and unconsolidated materials (sand, gravel, silt, and clay) into underground mined areas. There are two types of subsidence: (1) pit, also called sinkhole or pothole, and (2) sag or trough. Pit subsidence is characterized by an abrupt sinking of the ground surface, resulting in a circular, steep-sided, craterlike feature that has an inward drainage pattern. Sag subsidence occurs as a gentle, gradual settling of the ground surface and is associated with roof collapse, pillar crushing, or pillar punching. Mine subsidence is related to the strength or competency of bedrock, which is a measure of a rock's load-bearing capacity.



Diagrammatic cross section of typical subsidence resulting from mine roof collapse. No scale implied.

*Risks-*The City of Barberton and Summit County have had known subsidence issues. There is one underground mine near the southwest corner of the city. The area within the streets of Taylor Road, Harden Road, Alcorn Drive, 31st Street, and Hagey Drive are the closest to this mine. ODNR has performed subsurface investigations into the potential impact from this mine. The most recent was a study done in 2003, which developed risk rankings and remediation categories for 69 parcels. The city has also documented 5 other areas of concern.



Protection- The Ohio Mine Subsidence Insurance Law mandates mine subsidence coverage for all basic homeowner insurance policies in 26 Ohio Counties. The insurance is available on an optional basis for 11 other Ohio Counties; Summit County is included within this list. Underground mining was very prevalent throughout eastern Ohio. New mines are always being identified and located. Also, the extents of the known mines are not always identified. The existing mine maps do not always match what was excavated. When a potential void is found, the void can be filled with grouting or pillars to help support the weight. The best protection is to locate these abandoned underground mines and avoid construction over them.

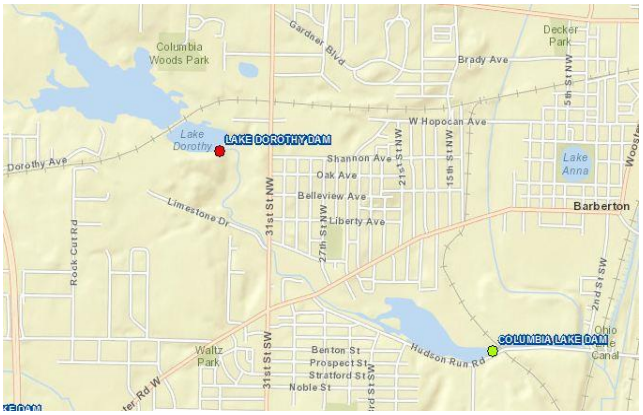
This home in Sugarcreek, Tuscarawas County, was damaged by the collapse of an underground mine. July 9, 2009.

Data Sources: 1) http://www.dnr.state.oh.us/Portals/10/pdf/GeoFacts/geof12.pdf 2) *Barberton Subsidence Risk Evaluation Project (2003)* 3) *http://www.ohiominesubsidence.com*

DAM and LEVEE FAILURE

City of Barberton, Ohio

*Overview-*A dam is a barrier that impounds water or underground streams. Dams generally serve the primary purpose of retaining water, while other structures such as floodgates or levees are used to manage or prevent water flow into specific land regions. Dams range in size from small (less than 40 feet), intermediate (40-100 feet), and Large (more than 100 feet). There are 4 dams within or near the City of Barberton, which could impact the city during a breach. Lake Dorothy Dam (Class I) and Columbia Lake Dam (Class II) are the closest to the city and both are owned by PPG Industries. Lake Dorothy Dam has a height of 35.5 feet with a volume of 2,320 ac-ft. Wolf Creek Dam (Class I) holds back the Barberton Reservoir, which provides the main drinking water source for the city. North Reservoir Dam (Class I) is part of the Portage Lake System within Summit County. The Federal Emergency Management Agency (FEMA) defines a levee as "a man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water in order to reduce the risk from temporary flooding.".



*Risks-*Dams are categorized according to the degree of threat to life and property in case of failure. Ohio recognizes three dam classifications. Class I dams are those for which failure has a high probability of causing loss of life or substantial economic loss. Class II dams are those for which failure has a moderate probability for causing loss of life or substantial economic loss. Class III dams are those for which failure has a low probability for causing loss of life or substantial economic loss. Levees can fail in a number of ways; these include overtopping, piping, seepage and saturation, erosion, and structural failure. When levees fail or overtop the consequence to safety and property is much higher than in a typical flooding event. No levee provides full protection from flooding.

*Protection-*In the case of a dam or levee failure the consequences are very serious. Identify the dams and levees in your community and notify citizens who live in these areas of the potential risk. Performing normal maintenance to any dam or levee is vital. Plan and know your evacuation route in the event of a failure. Encourage sustainable economic development for businesses. By knowing the potential risk, business owners can take proactive measures to be better prepared should a catastrophic event occur. Consult your local floodplain manager or Ohio Emergency Management Agency to see if your property is at risk in case of a dam of levee failure. If so, it would be encouraged to purchase flood insurance to cover any losses. Communities should prepare an Emergency Action Plans to protect citizens in the event of a levee or dam failure.

Data Sources: 1) *http://damsafety.org* 2) *http://www.fema.gov* 3) http://www.dnr.state.oh.us/water/tabid/3329/Default.aspx

TORNADOES

City of Barberton, Ohio

*Overview-*Tornadoes pose a risk to Illinois and can appear with little to no warning. A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. According to the National Weather Service, tornado wind speeds normally range from 40 miles per hour to more than 300 miles per hour. Most tornadoes are a few dozen yards wide and touchdown briefly, but even small short-lived tornadoes can inflict tremendous damage. Highly destructive tornadoes may carve out a path over a mile wide and several miles long.

*Risks-*Some tornadoes are clearly visible while rain or nearby low-hanging clouds obscure them. Tornadoes can develop so rapidly that advance warning is not possible. Tornados are more likely to occur during the months of March through May in the late afternoon and early evening. Typically, tornadoes cause the greatest damage to structures of light construction, including residential dwellings, particularly mobile homes. Locations where a tornado may touchdown are completely random and sometimes it's difficult to predict specific areas. Low flat areas are more susceptible to tornado activity then mountainous ones. Tornadoes often damage structures, power and gas lines, and electrical systems, therefore risk of fire, electrocution, or an explosion is possible. Once wind enters a structure, the likelihood of severe structural damage increases and the contents of the building will be exposed to the elements. Tornados can disrupt businesses, damage crops and property, or cause injury and death.

EF-SCALE NUMBER	INTENSITY PHRASE	3 SECOND GUST (MPH)	TYPE OF DAMAGE DONE
F0	GALE	65–85	Some damage to chimneys; breaks branches off trees; pushes over shallow-rooted trees; damages to sign boards.
F1	MODERATE	86–110	The lower limit is the beginning of hurricane wind speed; peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos pushed off the roads; attached garages may be destroyed.
F2	SIGNIFICANT	111–135	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars pushed over; large trees snapped or uprooted; light object missiles generated.
F3	SEVERE	136–165	Roof and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted.
F4	DEVASTATING	166–200	Well-constructed houses leveled; structures with weak foundations blown off some distance; cars thrown and large missiles generated.
F5	INCREDIBLE	Over 200	Strong frame houses lifted off foundations and carried considerable distances to disintegrate; automobile sized missiles fly through the air in excess of 100 meters; trees debarked; steel re-enforced concrete structures badly damaged.

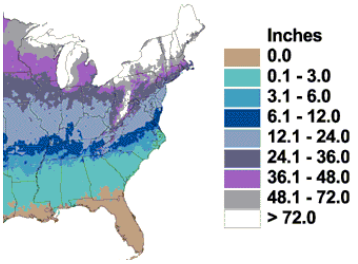
*Protection-*The less time there is to warn and evacuate, the more important it is to protect people from tornado dangers with long-term mitigation solutions. Locate all safe rooms and potential safe rooms throughout the community. A safe room is a room or structure specifically designed and constructed to resist wind pressures and wind-borne debris impacts during an extreme-wind event. Make sure to validate these safe rooms comply with current safety standards. Make sure local building codes are adequate to withstand current wind resistant safety standards. Communities that are prone to tornados can install tornado sirens to warn residents of any activity in the area.

Data Sources: 1) *http://www.fema.gov* 2) *http://www.spc.noaa.gov/efscale*

WINTER STORMS

City of Barberton, Ohio

*Overview-*Everyone that lives in Illinois is at risk when it comes to winter storms. Winter storms are not necessarily restricted to the winter season, but may occur in the late autumn and early spring. Conditions include freezing temperatures, heavy snowfall or freezing rain. Classifications of winter storms are blizzards, heavy snow storms, and ice storms. A blizzard is the most dangerous, combing low temperatures, heavy snowfall and winds of at least 35 miles per hour, reducing visibility to only a few yards. Heavy snow storms can produce six inches or more of snow in 48 hours or less. Lastly, ice storms occur when moisture falls and freezes immediately upon impact. Severe winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Ice can accumulates on trees, power lines, communication towers, structures, roads, and other hard surfaces. Winter storm conditions can immobilize entire regions for long periods of time.



*Risks-*Winter storms can result in traffic accidents, flooding, closed highways, blocked roads, downed power lines and trees, carbon monoxide poisoning, and hypothermia. These impacts have the potential to last for days causing a serious risk to communities and responders. Severe winter weather can also have a devastating effect on agricultural damaging crops and loss of livestock. During winter storms visibility can be limited and extremely difficult at night and staying off the road is advised. Homes can be at risk with heavy snow thus causing roofs to collapse if the weight becomes too much.

*Protection-*By monitoring the radio, television, and internet you can be prepared for an incoming winter storm. Ways to protect yourself from a winter storm would be having an extra supply of water and food that does not require cooking or refrigeration. Ensure that you have plenty of warm clothes and a flash light in case the power goes out for a long period of time. Try to stay indoors and avoid overexertion such as when shoveling snow. Dress warm as frostbite and hypothermia are common injuries. Stay off the roads unless it is absolutely necessary to avoid an accident. Major roads in communities should try to remain plowed and salted in case there is a need for evacuation, medical attention, or to restore power. In areas where power outages are frequent the use of portable generators can provide some comfort and ease the long term power outages.

Data Sources: 1) *http://ema.ohio.gov/*2) *http://www.fema.gov*

EARTHQUAKES

City of Barberton, Ohio

*Overview-*An earthquake is caused by a crack or rupture in Earth's tectonic plates, or when tectonic plates push against each other. This causes movement or trembling of the ground producing a sudden displacement of rock in the Earth's crust. This process can last tens of seconds up to a few minutes depending on the magnitude of the event, what kinds of rock is being penetrated, and the stiffness or lack of stiffness of the soils at a site. Earthquakes can affect hundreds of thousands of square miles. Over 120 small to moderate earthquakes are known to have occurred in Ohio during the past two centuries.

*Risks-*The Richter Scale has been the most commonly and familiar earthquake scale for measuring magnitude. It's important to know that earthquake magnitude increases by a factor of 10 as magnitude increases by one whole number. Earthquakes can cause damage to property measured in the tens of billions of dollars. Most property damage and earthquake-related injuries and deaths are caused by the failure and collapse of structures due to ground shaking. The level of damage can depend on the level of magnitude and duration of the shaking. Other damaging earthquake effects include landslides and liquefaction of soil (much like quicksand). During an earthquake, people can be injured or killed by falling or collapsing objects, objects thrown into the air, or by earthquake-induced fires or flooding. Direct losses can include damage to infrastructure and buildings, power and content losses, fire, and gas leaks.

Richter Scale

RICHTER MAGNITUDES	EARTHQUAKE EFFECTS
< 3.5	Generally not felt, but recorded.
3.5 - 5.4	Often felt, but rarely causes damage.
5.4 - 6.0	At most slight damage to well-designed buildings. Can cause major damage to poorly constructed buildings over small regions.
6.1 - 6.9	Can be destructive in areas up to about 100 kilometers across where people live.
7.0 - 7.9	Major earthquake. Can cause serious damage over larger areas.
8 or >	Great earthquake. Can cause serious damage in areas several hundred kilometers across.

Source: Federal Emergency Management Agency

*Protection-*Currently, there is no reliable way to predict when an earthquake will occur at any given location. All people in an earthquake-stricken area are potentially at risk at any moment. Below are methods to protect individuals in case of an earthquake:

If Indoors

- **DROP** to the ground; take **COVER** by getting under a sturdy table or other piece of furniture; and **HOLD ON** until the shaking stops.
- Stay away from elevators, glass, windows, outside doors and walls, and anything that could fall, such as lighting fixtures or furniture.
- Stay inside until the shaking stops and it is safe to go outside.

If Outdoors – Stay there

- Move away from buildings, streetlights, and utility wires.
- Once in the open, stay there until the shaking stops.

If in a Moving Vehicle

- Stop as quickly as safety permits and stay in the vehicle.
- Proceed cautiously once the earthquake has stopped. Avoid roads, bridges, or ramps that might have been damaged by the earthquake.

Data Sources: 1) *http://ema.ohio.gov/*2) *http://www.fema.gov*

HAZARDOUS MATERIAL ACCIDENTS


City of Barberton, OH

Overview- Hazardous waste is waste that is dangerous or potentially harmful to our health or the environment. Hazardous wastes can be liquids, solids, gases, or sludges. They can be discarded commercial products, like cleaning fluids or pesticides, or the by-products of manufacturing processes. The term **Extremely Hazardous Substance** (EHS) refers to those chemicals that could cause serious health effects following short-term exposure from accidental releases. Summit County has more than 2,500 fixed facility locations that report the presence reportable chemicals. Hazardous materials can occur naturally in the earth or atmosphere; others are synthetic, or human-made. When we use and dispose of them properly, they enhance our quality of life.

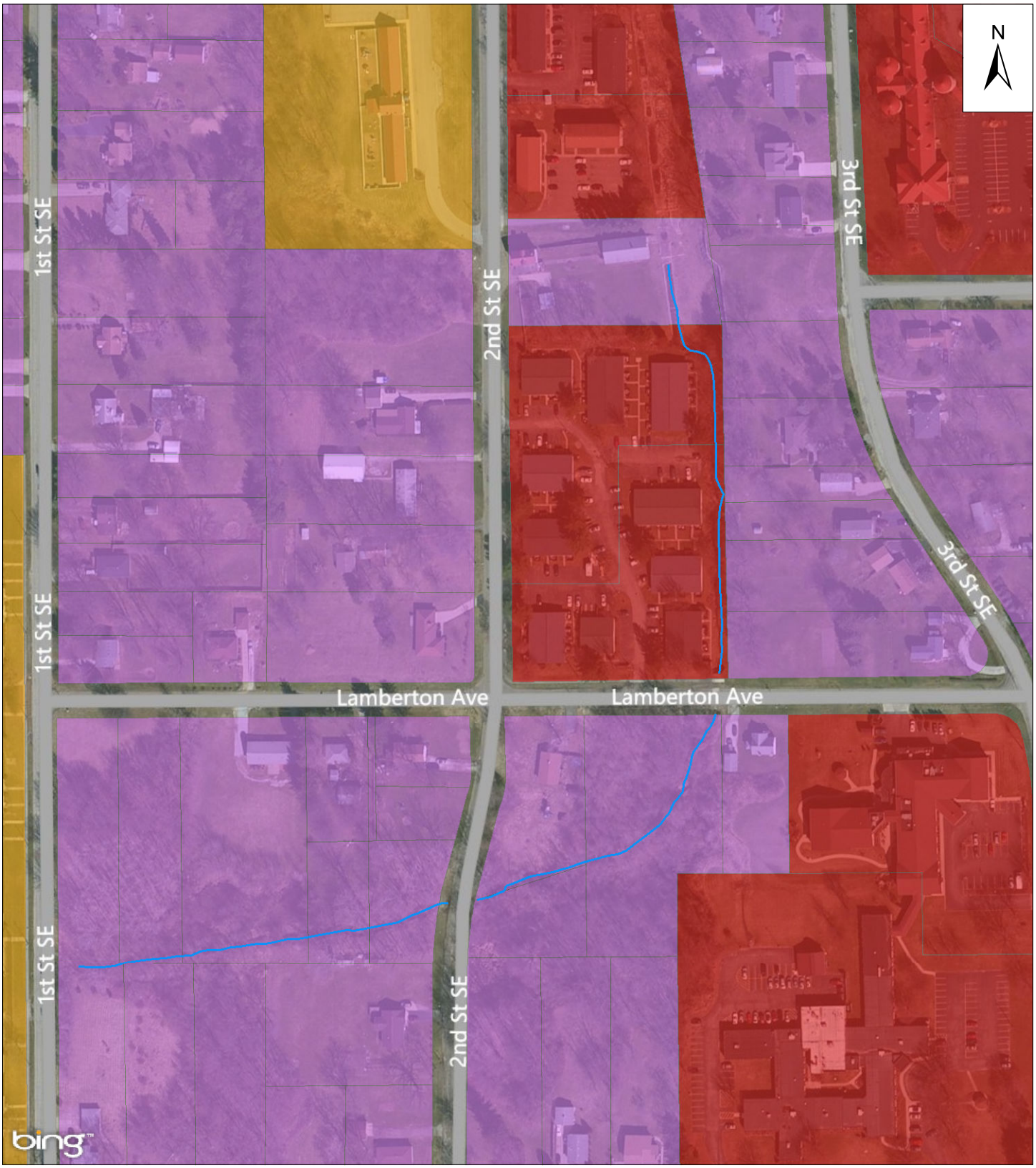
*Risks-*Hazardous materials when used or disposed of improperly can have harmful effects on humans, plants, and animals. Human tissue exposed to hazardous materials over a long period of time can disrupt the body's natural repair processes, permitting the uncontrolled growth of cells, also known as cancer. Very high-levels of exposure to any hazardous material within a short time can be even more serious.

*Protection-*Hazardous accidents are unpredictable so it's important to always be prepared. The best ways to protect yourself is to be familiar with any potential dangers, know the warning system in your community (if equipped), and be prepared to evacuate or take shelter in a safe location. Proper disposal of any hazardous material is essential to protecting the health and safety of the public and environment. Radioactive waste disposal practices have improved substantially over the last twenty years. Hazardous waste designs for new disposal facilities and disposal methods have become stricter over the years. Become aware about any possible hazardous materials threats in your area, this will help you remain alert to these threats and contribute to your well-being. For example, learning to detect the presence of a hazardous substance, researching response and evacuation plans, and becoming familiar with local warning systems will help you protect yourself and those around you.

Data Sources: 1) *https://co.summitoh.net/index.php/departments/law/public-safety/emergency-management/236-hazardous-materials-response-team*2) *http://www.fema.gov* 3) *http://www.epa.gov/osw/hazard*

Appendix G

Areas of Flooding
HAZUS Flooding & Earthquake Analysis



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
City of Barberton - Stormwater & Floodplain Dept.

Stantec

Legend

- Senior Citizen Housing FP
- Tornado Shelters FP
- Utilities FP
- School Facilities FP
- Buildings Inside FEMA Floodplains
  - 500-Year
  - 100-Year
  - Floodway
- **Jurisdictions**
  - Other Jurisdictions
  - City of Barberton
- **Barberton Parcels**
  - **CLASS**
  - Agricultural
  - Commercial
  - Exempt
  - Industrial
  - Other
  - Residential
  - Unknown

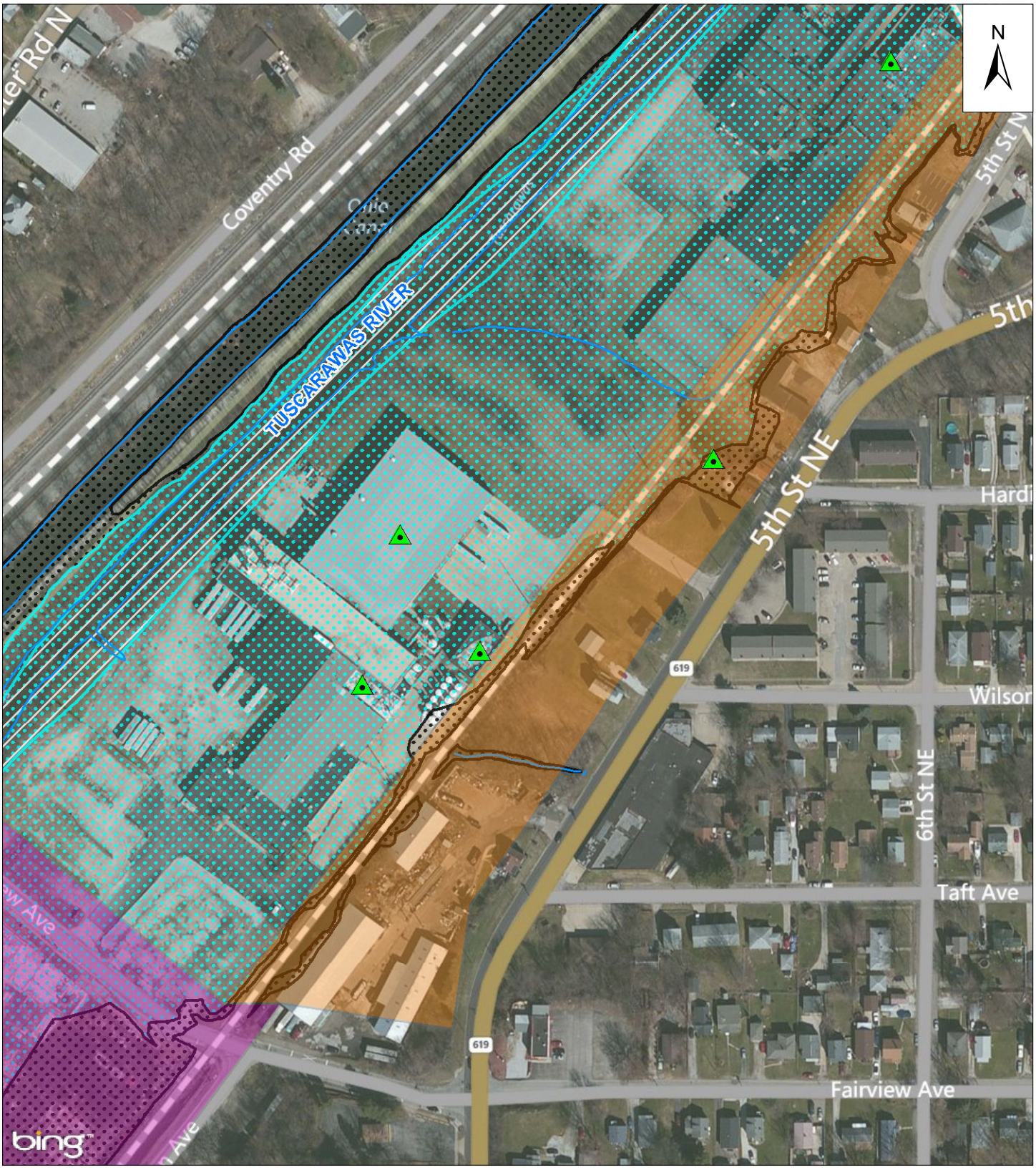
0 100 Feet
1 inch equals 200 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix G-1

February 2015

Title
Area of Flooding 2nd STREET SE, LAMBERTON AVE.



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
City of Barberton - Stormwater & Floodplain Dept.

Stantec

Legend

- Senior Citizen Housing FP
- Tornado Shelters FP
- Utilities FP
- School Facilities FP
- Buildings Inside FEMA Floodplains
- 500-Year
- 100-Year
- Floodway

Jurisdictions

- Other Jurisdictions
- City of Barberton

Annualized Loss Hazus TotalLoss ($1,000)

- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 250
- 251 - 500
- 501 - 1,000

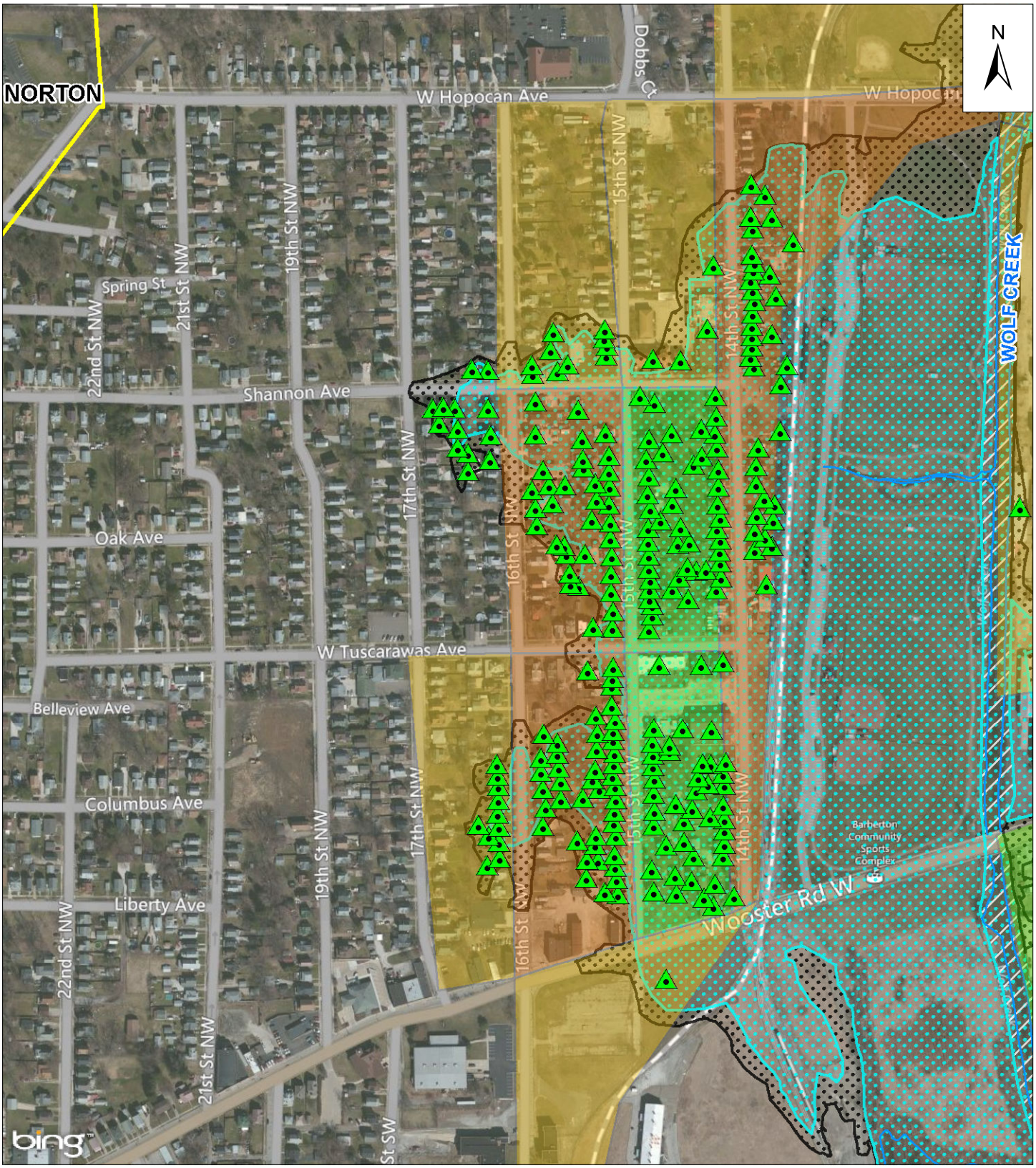
0 100 Feet
1 inch equals 200 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix G-2

February 2015

Title
Area of Flooding
5TH ST. NE INDUSTRIAL AREA – TUSCARAWAS RIVER



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
City of Barberton - Stormwater & Floodplain Dept.

Stantec

Legend

- Senior Citizen Housing FP
- Tornado Shelters FP
- Utilities FP
- School Facilities FP
- Buildings Inside FEMA Floodplains
  - 500-Year
  - 100-Year
  - Floodway
- Jurisdictions
  - Other Jurisdictions
  - City of Barberton
- Annualized Loss Hazus TotalLoss ($1,000)
  - 1 - 10
  - 11 - 50
  - 51 - 100
  - 101 - 250
  - 251 - 500
  - 501 - 1,000

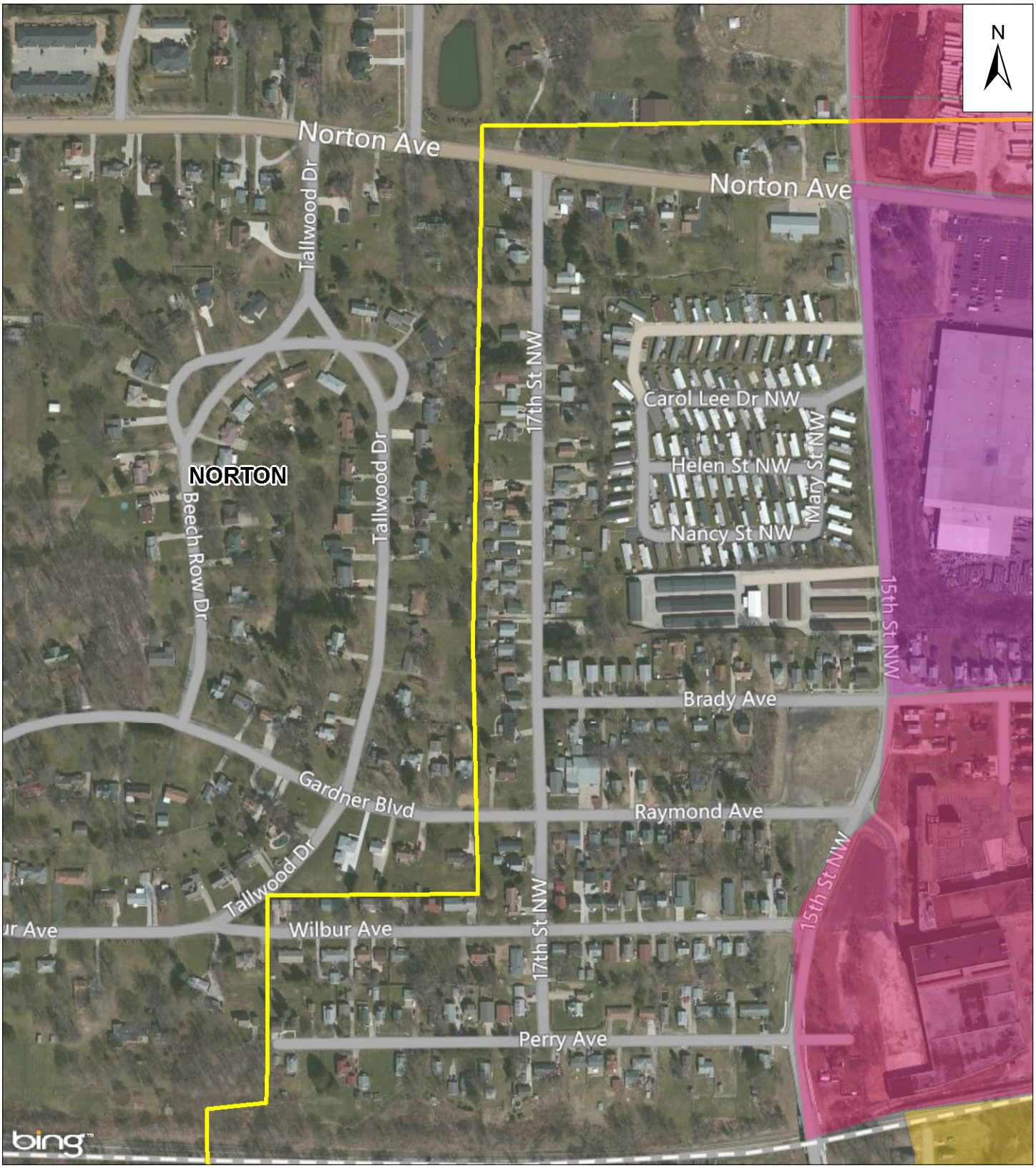
0 100
Feet
1 inch equals 400 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix G-3

February 2015

Title
Area of Flooding 14th - 20th ST NW



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
City of Barberton - Stormwater & Floodplain Dept.

Stantec

Legend

- Senior Citizen Housing FP
- Tornado Shelters FP
- Utilities FP
- School Facilities FP
- Buildings Inside FEMA Floodplains
  - 500-Year
  - 100-Year
  - Floodway
- Jurisdictions
  - Other Jurisdictions
  - City of Barberton
- Annualized Loss Hazus TotalLoss ($1,000)
  - 1 - 10
  - 11 - 50
  - 51 - 100
  - 101 - 250
  - 251 - 500
  - 501 - 1,000

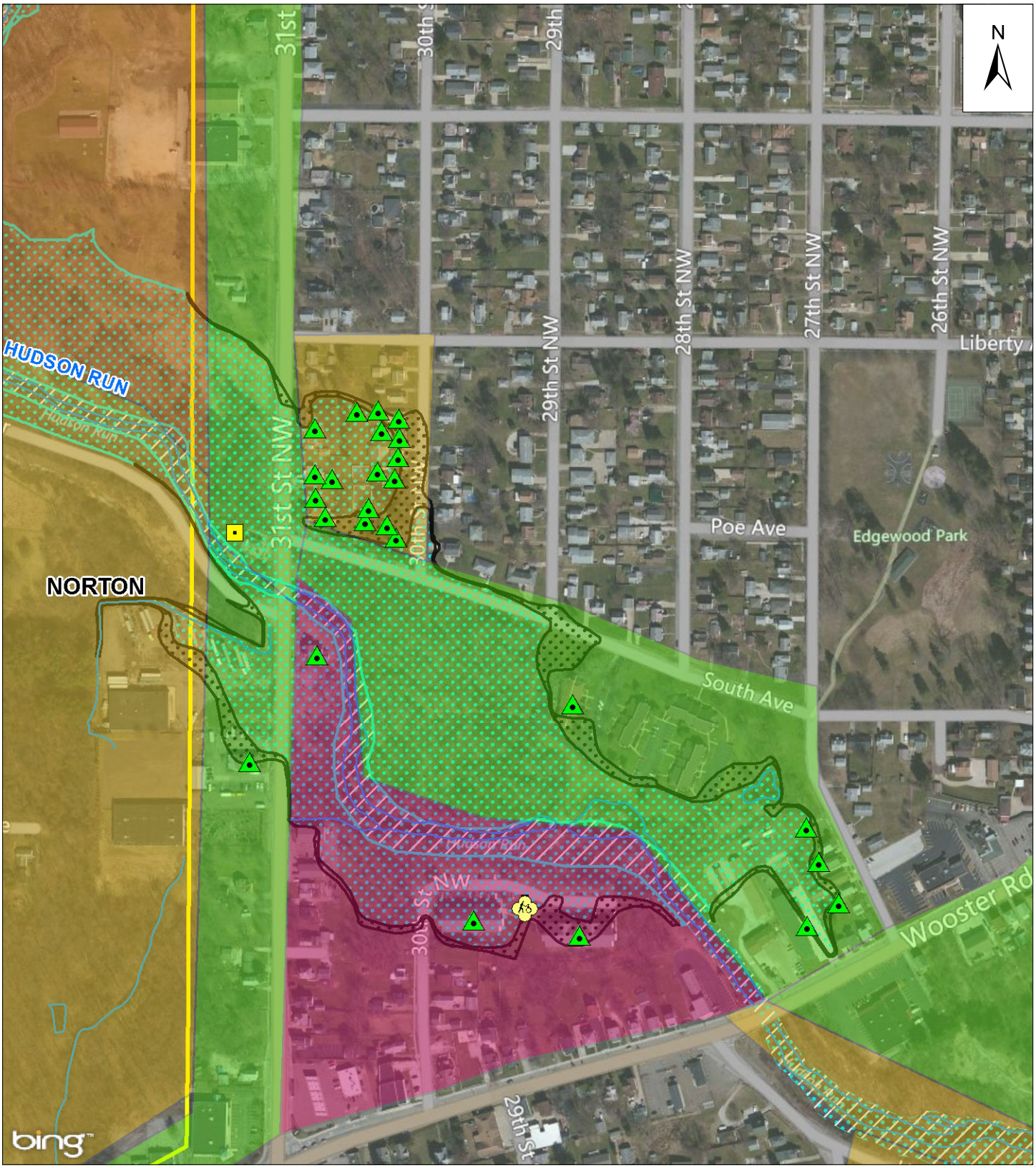
0 100 Feet
1 inch equals 350 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix G-4

February 2015

Title
Area of Flooding 17st NW.



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
City of Barberton - Stormwater & Floodplain Dept.

Stantec

Legend

- Senior Citizen Housing FP
- Tornado Shelters FP
- Utilities FP
- School Facilities FP
- Buildings Inside FEMA Floodplains
  - 500-Year
  - 100-Year
  - Floodway
- Jurisdictions
  - Other Jurisdictions
  - City of Barberton
- Annualized Loss Hazus
  TotalLoss ($1,000)
  - 1 - 10
  - 11 - 50
  - 51 - 100
  - 101 - 250
  - 251 - 500
  - 501 - 1,000

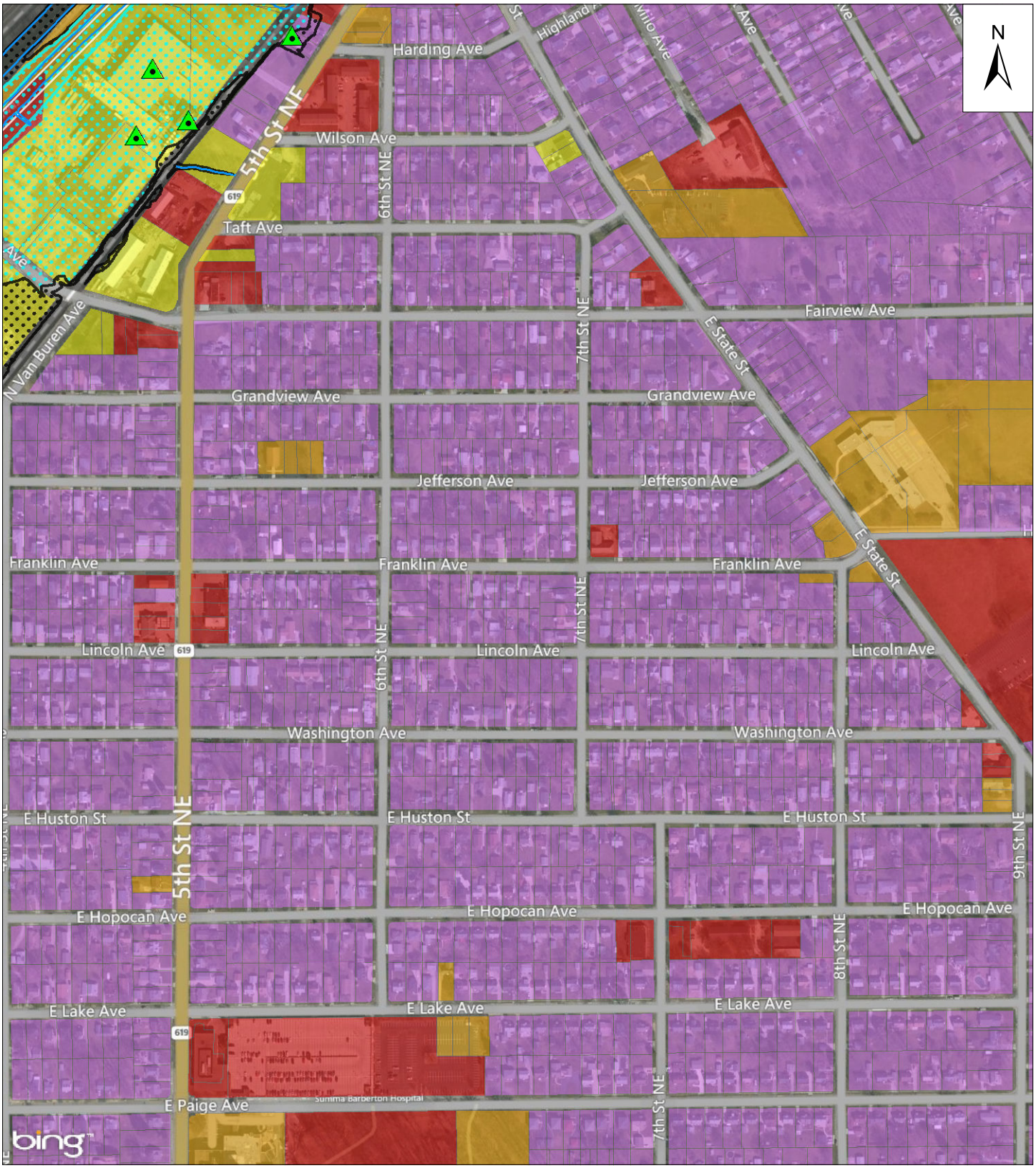
0 100 Feet
1 inch equals 350 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix G-5

February 2015

Title
Area of Flooding
30th &31ST STREETS NW, SOUTH AVE. - HUDSON RUN



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
City of Barberton - Stormwater & Floodplain Dept.

Stantec

Legend

- Senior Citizen Housing FP
- Tornado Shelters FP
- Utilities FP
- School Facilities FP
- Buildings Inside FEMA Floodplains
- 500-Year
- 100-Year
- Floodway

Jurisdictions
- Other Jurisdictions
- City of Barberton

Barberton Parcels
CLASS
- Agricultural
- Commercial
- Exempt
- Industrial
- Other
- Residential
- Unknown

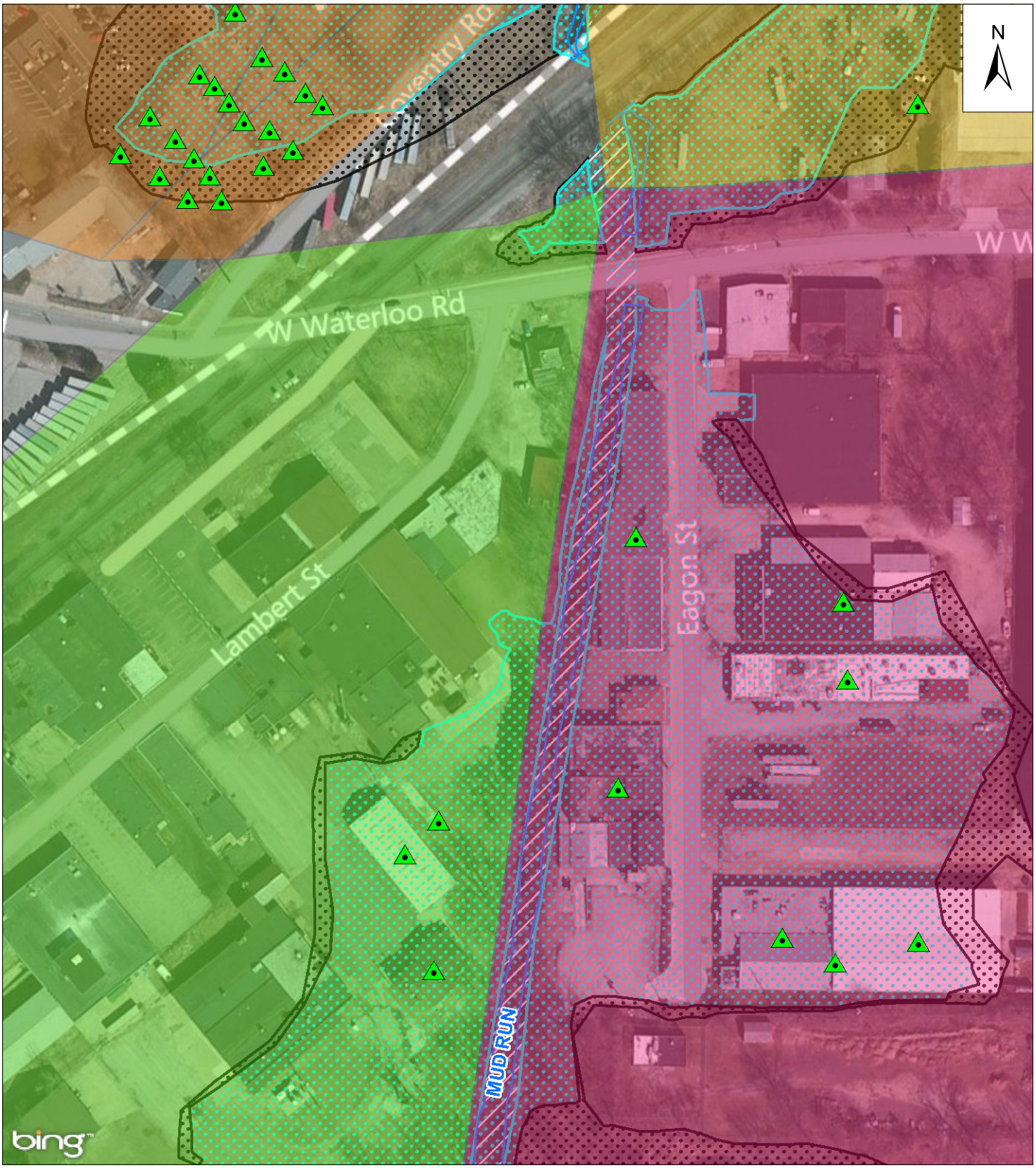
0 100 Feet
1 inch equals 450 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix G-6

February 2015

Title
Area of Flooding
AREA EAST OF 5TH ST. NE



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
City of Barberton - Stormwater & Floodplain Dept.

Stantec

Legend

- Senior Citizen Housing FP
- Tornado Shelters FP
- Utilities FP
- School Facilities FP
- Buildings Inside FEMA Floodplains
  - 500-Year
  - 100-Year
  - Floodway
- Jurisdictions
  - Other Jurisdictions
  - City of Barberton
- Annualized Loss Hazus
  TotalLoss ($1,000)
  - 1 - 10
  - 11 - 50
  - 51 - 100
  - 101 - 250
  - 251 - 500
  - 501 - 1,000

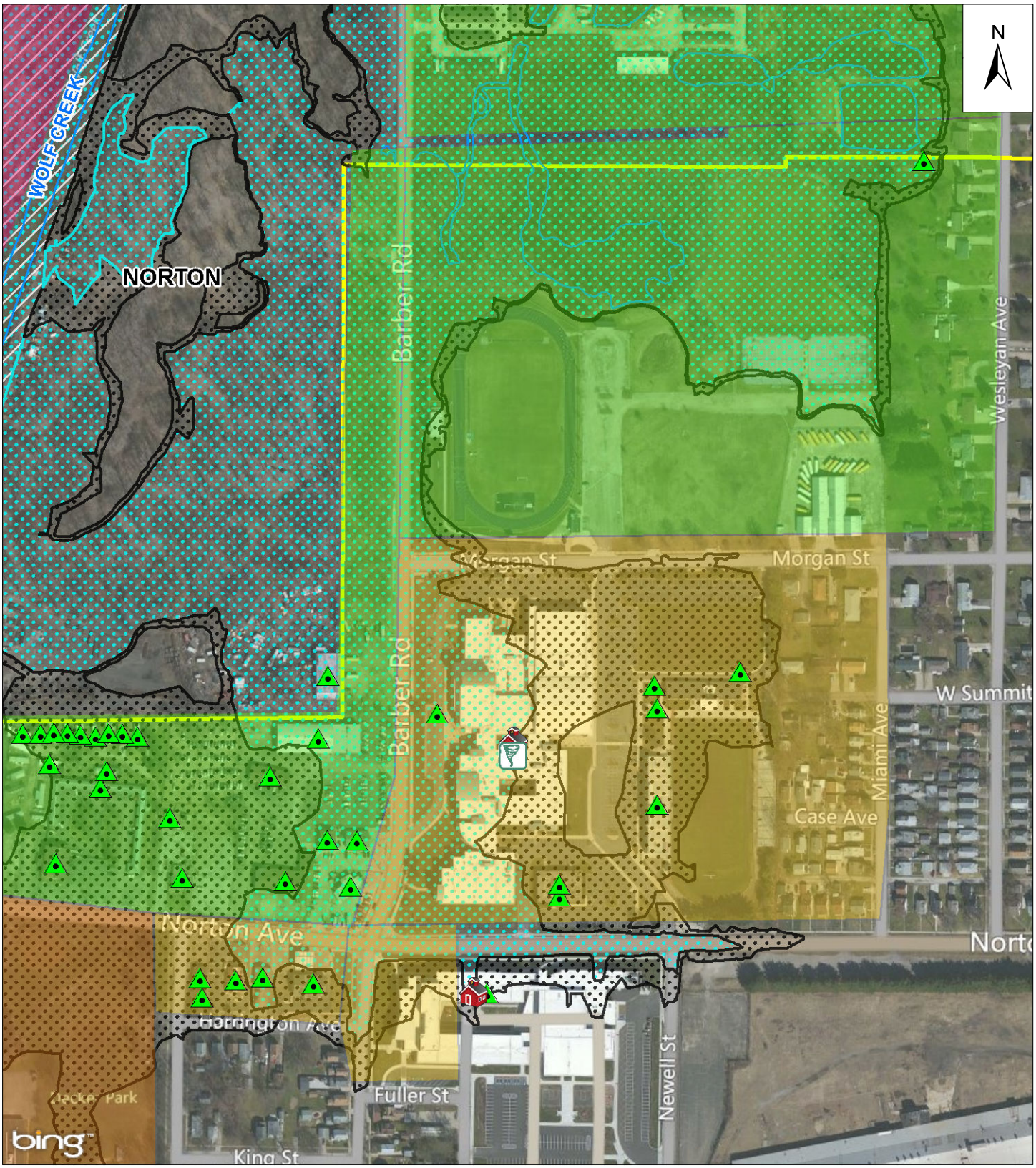
0 100 Feet
1 inch equals 150 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix G-7

February 2015

Title
Area of Flooding
COVENTRY RD , EAGON ST INDUSTRIAL AREAS



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
City of Barberton - Stormwater & Floodplain Dept.

Stantec

Legend

- Senior Citizen Housing FP
- Tornado Shelters FP
- Utilities FP
- School Facilities FP
- Buildings Inside FEMA Floodplains
- 500-Year
- 100-Year
- Floodway

Jurisdictions

- Other Jurisdictions
- City of Barberton

Annualized Loss Hazus TotalLoss ($1,000)

- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 250
- 251 - 500
- 501 - 1,000

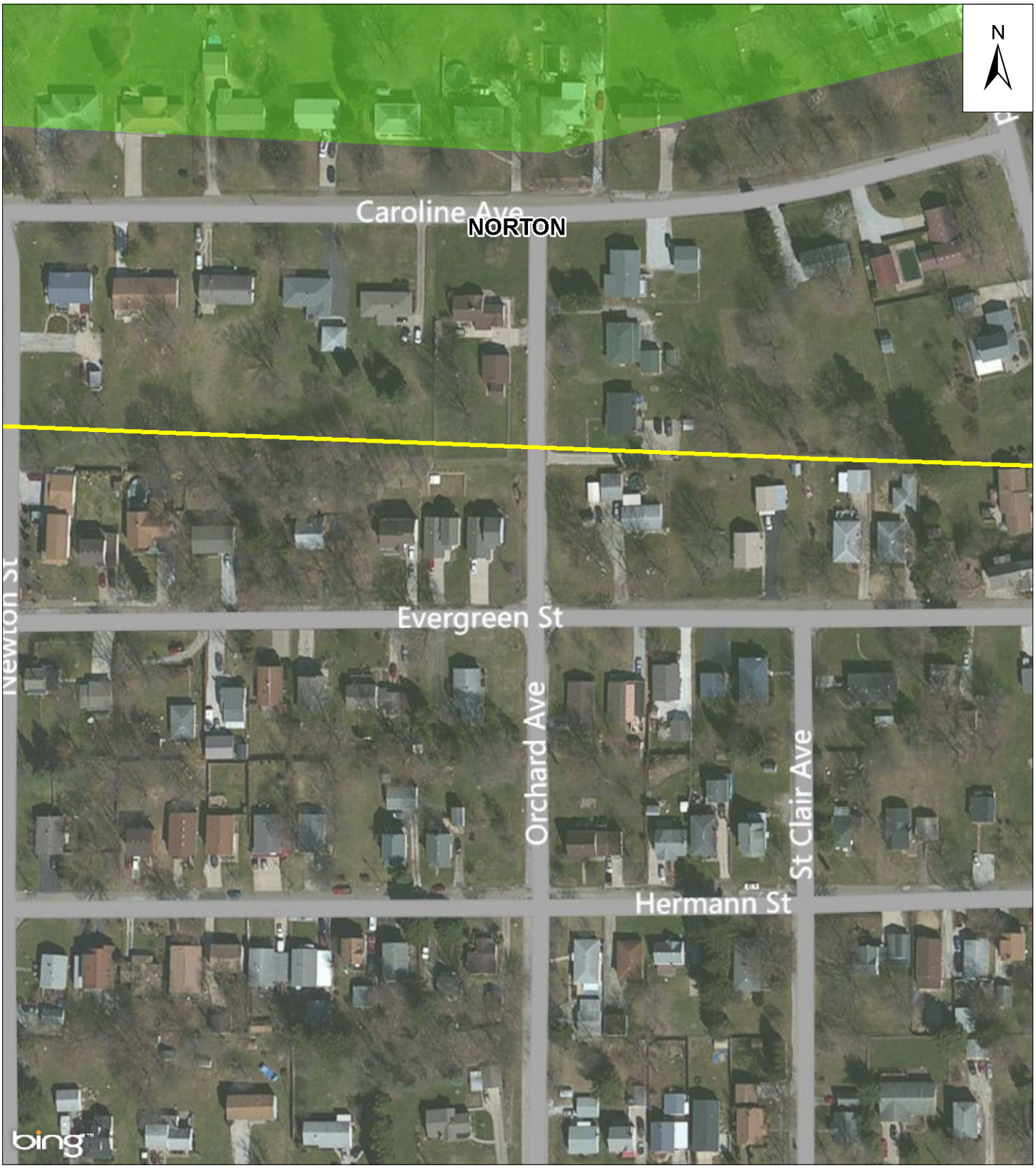
0 100 Feet
1 inch equals 350 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix G-8

February 2015

Title
Area of Flooding
NORTON AVE. BARBER RD, MIAMI ST. - WOLF CREEK



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
City of Barberton - Stormwater & Floodplain Dept.

Stantec

Legend

- Senior Citizen Housing FP
- Tornado Shelters FP
- Utilities FP
- School Facilities FP
- Buildings Inside FEMA Floodplains
  - 500-Year
  - 100-Year
  - Floodway
- **Jurisdictions**
  - Other Jurisdictions
  - City of Barberton
- **Annualized Loss Hazus TotalLoss ($1,000)**
  - 1 - 10
  - 11 - 50
  - 51 - 100
  - 101 - 250
  - 251 - 500
  - 501 - 1,000

The Magic City BARBERTON Founded 1891

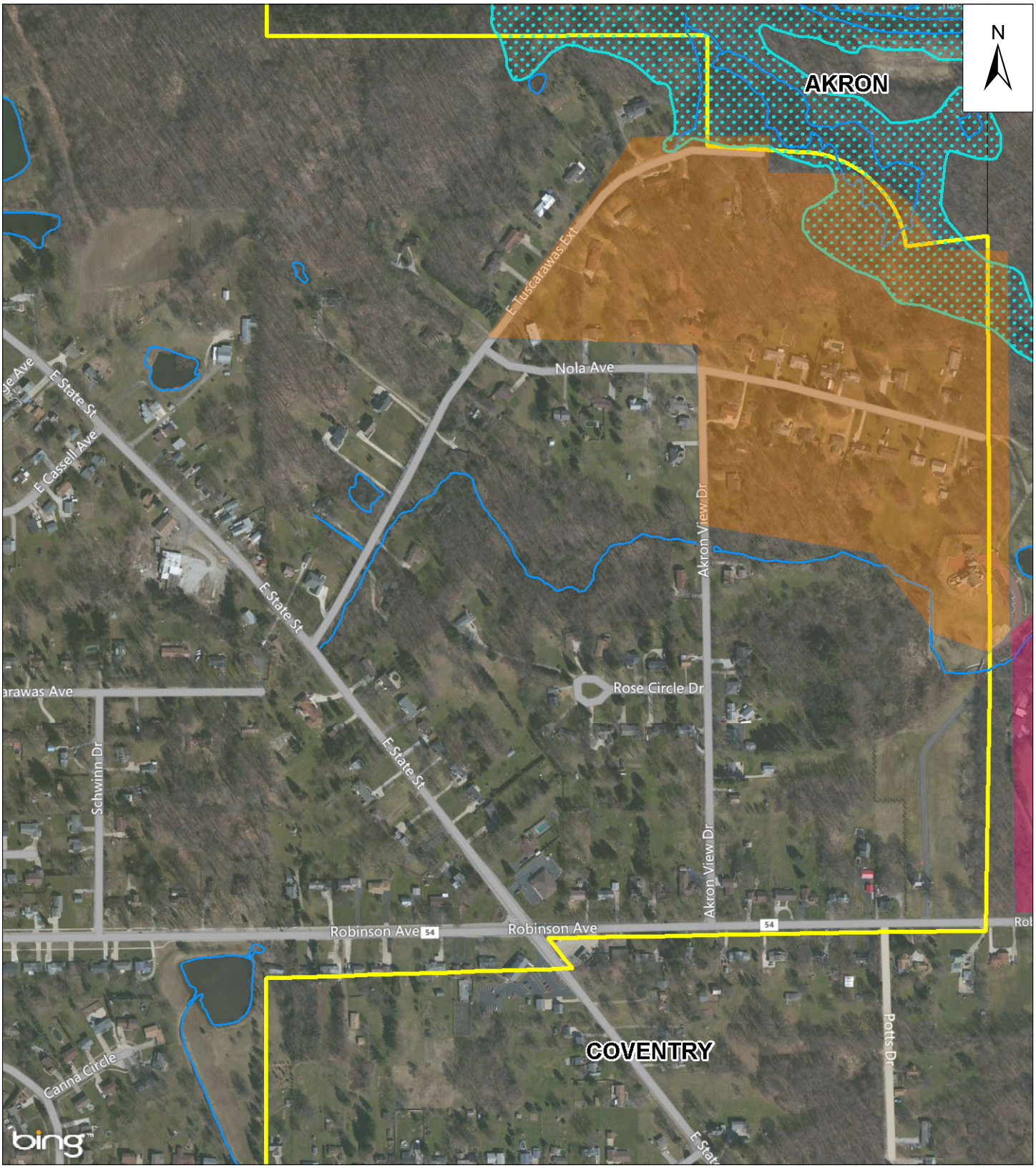
0 100 Feet
1 inch equals 150 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix G-9

February 2015

Title
Area of Flooding ORCHARD ST AND EVERGREEN AVE.



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
City of Barberton - Stormwater & Floodplain Dept.

Stantec

Legend

- Senior Citizen Housing FP
- Tornado Shelters FP
- Utilities FP
- School Facilities FP
- Buildings Inside FEMA Floodplains
  - 500-Year
  - 100-Year
  - Floodway
- **Jurisdictions**
  - Other Jurisdictions
  - City of Barberton
- **Annualized Loss Hazus TotalLoss ($1,000)**
  - 1 - 10
  - 11 - 50
  - 51 - 100
  - 101 - 250
  - 251 - 500
  - 501 - 1,000

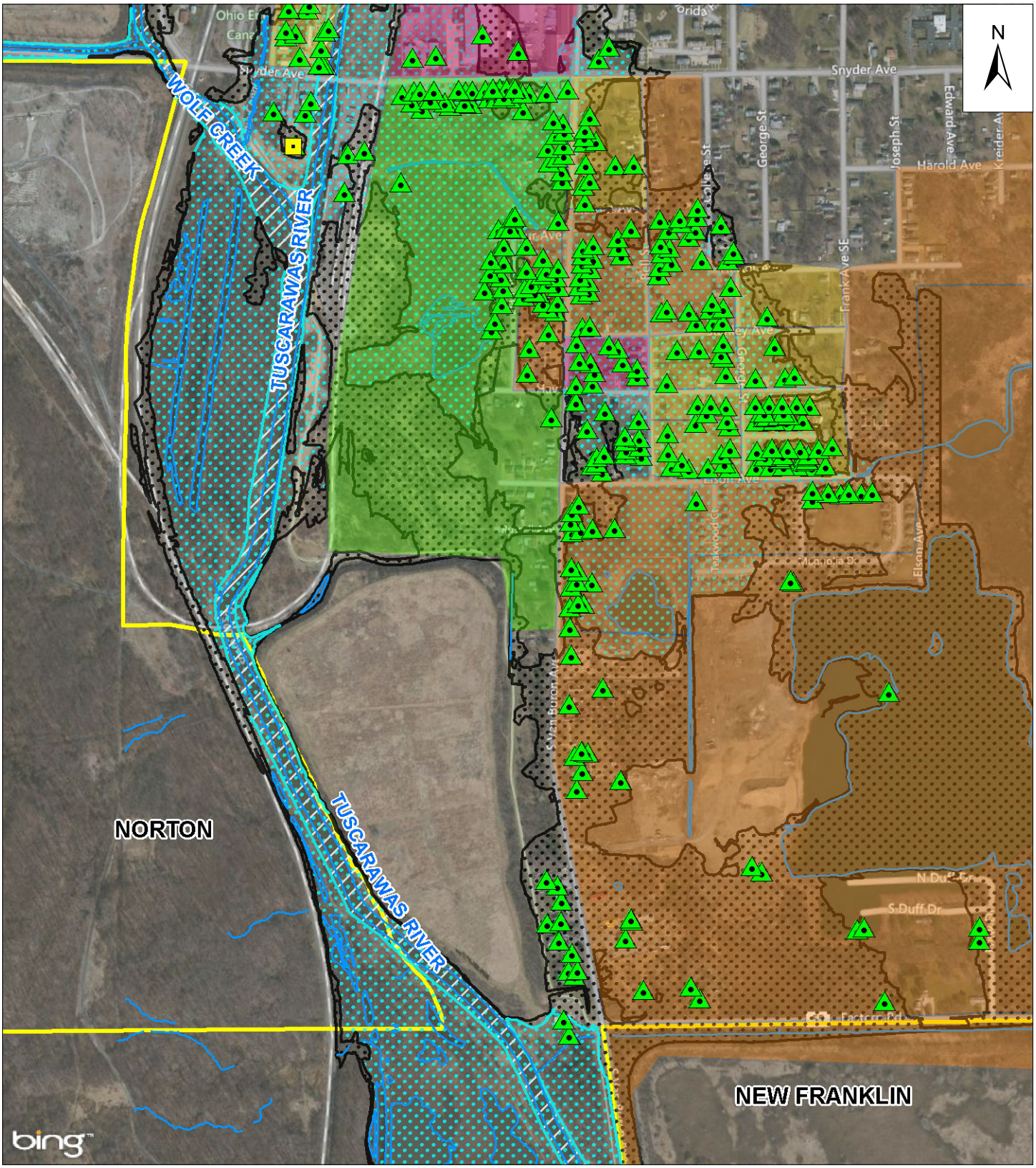
0 100
Feet
1 inch equals 500 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix G-10

February 2015

Title
Area of Flooding
ROBINSON AVE., EAST TUSCARAWAS AVE.



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
City of Barberton - Stormwater & Floodplain Dept.

Stantec

Legend

- Senior Citizen Housing FP
- Tornado Shelters FP
- Utilities FP
- School Facilities FP
- Buildings Inside FEMA Floodplains
  - 500-Year
  - 100-Year
  - Floodway
- Jurisdictions
  - Other Jurisdictions
  - City of Barberton

Annualized Loss Hazus
TotalLoss ($1,000)
- 1 - 10
- 11 - 50
- 51 - 100
- 101 - 250
- 251 - 500
- 501 - 1,000

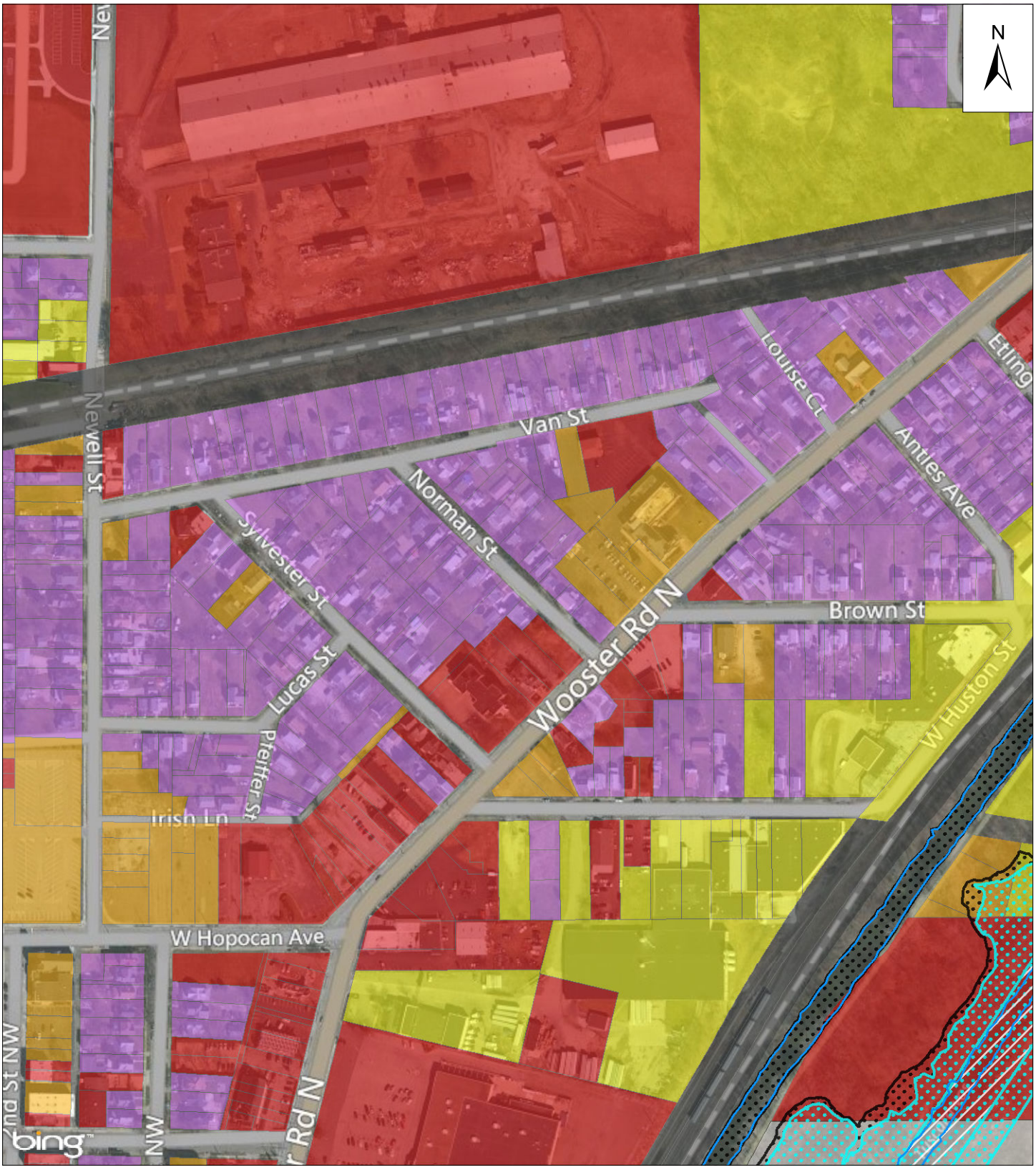
0 100
Feet
1 inch equals 750 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix G-11

February 2015

Title
Area of Flooding
SOUTH BARBERTON – TUSCARAWAS RIVER



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Revised: 2015-02-26 By: apooler

Notes: 1. Coordinate System: NAD 1983 StatePlane Ohio North FIPS 3401 Feet 2. Base features: Bing Maps Hybrid

Source: Summit County GIS Data
City of Barberton - Stormwater & Floodplain Dept.

Stantec

Legend

- Senior Citizen Housing FP
- Tornado Shelters FP
- Utilities FP
- School Facilities FP
- Buildings Inside FEMA Floodplains
- 500-Year
- 100-Year
- Floodway

Jurisdictions
- Other Jurisdictions
- City of Barberton

Barberton Parcels
CLASS
- Agricultural
- Commercial
- Exempt
- Industrial
- Other
- Residential
- Unknown

0 100 Feet
1 inch equals 300 feet

City of Barberton Multi-Hazard Mitigation Plan

Attachment
Appendix G-12

February 2015

Title
Area of Flooding VAN- HYNING NEIGHBORHOOD

Hazus-MH: Flood Event Report

Region Name: Barberton_Flood_FEMA_floodplains

Flood Scenario: AAL_calculation

Print Date: Thursday, May 09, 2013

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social

Table of Contents

General Description of the Region

Hazus is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of Hazus is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county(ies) from the following state(s):

- Ohio

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 118 square miles and contains 3,835 census blocks. The region contains over 81 thousand households and has a total population of 196,146 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 80,832 buildings in the region with a total building replacement value (excluding contents) of 16,646 million dollars (2006 dollars). Approximately 91.79% of the buildings (and 68.72% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 80,832 buildings in the region which have an aggregate total replacement value of 16,646 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	11,439,600	68.7%
Commercial	3,336,774	20.0%
Industrial	1,130,412	6.8%
Agricultural	53,157	0.3%
Religion	379,509	2.3%
Government	139,274	0.8%
Education	167,552	1.0%
Total	**16,646,278**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	453,726	49.0%
Commercial	155,139	16.7%
Industrial	293,796	31.7%
Agricultural	2,082	0.2%
Religion	18,184	2.0%
Government	2,109	0.2%
Education	1,502	0.2%
Total	**926,538**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 462 beds.
There are 84 schools, 14 fire stations, 16 police stations and no emergency operation centers.

Flood Scenario Parameters

Hazus used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Barberton_Flood_FEMA_floodplains
Scenario Name:	AAL_calculation
Return Period Analyzed:	Annual
Analysis Options Analyzed:	No What-Ifs

Building Damage

General Building Stock Damage

Analysis has not been performed for this Scenario.

Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Analysis has not been performed for this Scenario.												

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Analysis has not been performed for this Scenario.												

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 462 hospital beds available for use. On the day of the scenario flood event, the model estimates that 462 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	14	0	0	0
Hospitals	1	0	0	0
Police Stations	16	0	0	0
Schools	84	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

Hazus estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

Analysis has not been performed for this Scenario.

Social Impact

Shelter Requirements

Analysis has not been performed for this Scenario.

Economic Loss

The total economic loss estimated for the flood is 5.85 million dollars, which represents 0.63 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 5.84 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 19.21% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	0.73	0.33	0.66	0.05	1.77
	Content	0.40	1.19	1.72	0.32	3.62
	Inventory	0.00	0.04	0.41	0.01	0.45
	Subtotal	**1.12**	**1.56**	**2.78**	**0.38**	**5.84**
Business Interruption						
	Income	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00
	Rental Income	0.00	0.00	0.00	0.00	0.00
	Wage	0.00	0.01	0.00	0.00	0.01
	Subtotal	**0.00**	**0.01**	**0.00**	**0.00**	**0.01**
ALL	**Total**	**1.12**	**1.56**	**2.78**	**0.38**	**5.85**

Appendix A: County Listing for the Region

Ohio

- Summit

Appendix B: Regional Population and Building Value Data

	Population	Building Value (thousands of dollars)		
		Residential	Non-Residential	Total
Ohio				
Summit	196,146	11,439,600	5,206,678	16,646,278
Total	**196,146**	**11,439,600**	**5,206,678**	**16,646,278**
Total Study Region	**196,146**	**11,439,600**	**5,206,678**	**16,646,278**

Hazus-MH: Earthquake Event Report

Region Name: Barberton_Earthquake_2014

Earthquake Scenario: annual_prob

Print Date: January 07, 2014

Totals only reflect data for those census tracts/blocks included in the user's study region.

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General Description of the Region

Hazus is a regional earthquake loss estimation model that was developed by the Federal Emergency Management Agency and the National Institute of Building Sciences. The primary purpose of Hazus is to provide a methodology and software application to develop earthquake losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from earthquakes and to prepare for emergency response and recovery.

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Ohio

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 51.53 square miles and contains 14 census tracts. There are over 23 thousand households in the region which has a total population of 59,003 people (2002 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 24 thousand buildings in the region with a total building replacement value (excluding contents) of 4,529 (millions of dollars). Approximately 92.00 % of the buildings (and 70.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 689 and 454 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 24 thousand buildings in the region which have an aggregate total replacement value of 4,529 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 71% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 0 hospitals in the region with a total bed capacity of 0 beds. There are 16 schools, 5 fire stations, 3 police stations and 0 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 6 dams identified within the region. Of these, 2 of the dams are classified as 'high hazard'. The inventory also includes 43 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 1,143.00 (millions of dollars). This inventory includes over 76 kilometers of highways, 69 bridges, 1,156 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	69	107.70
	Segments	44	513.90
	Tunnels	0	0.00
		Subtotal	**621.60**
Railways	Bridges	0	0.00
	Facilities	1	2.70
	Segments	37	65.40
	Tunnels	0	0.00
		Subtotal	**68.10**
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
		Subtotal	**0.00**
Bus	Facilities	0	0.00
		Subtotal	**0.00**
Ferry	Facilities	0	0.00
		Subtotal	**0.00**
Port	Facilities	0	0.00
		Subtotal	**0.00**
Airport	Facilities	0	0.00
	Runways	0	0.00
		Subtotal	**0.00**
		Total	**689.70**

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	11.60
	Facilities	1	35.00
	Pipelines	0	0.00
		Subtotal	**46.50**
Waste Water	Distribution Lines	NA	6.90
	Facilities	6	419.60
	Pipelines	0	0.00
		Subtotal	**426.50**
Natural Gas	Distribution Lines	NA	4.60
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**4.60**
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	**0.00**
Electrical Power	Facilities	0	0.00
		Subtotal	**0.00**
Communication	Facilities	0	0.00
		Subtotal	**0.00**
		Total	**477.70**

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	annual_prob
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	Annualized
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	NA
Depth (Km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Building Damage

Hazus estimates that about 46 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	7	0.03	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	501	2.16	0	0.00	0	0.00	0	0.00	0	0.00
Education	1	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	6	0.03	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	190	0.82	0	0.00	0	0.00	0	0.00	0	0.00
Other Residential	3,293	14.21	13	4.85	0	0.00	0	0.00	0	0.00
Religion	67	0.29	0	0.00	0	0.00	0	0.00	0	0.00
Single Family	19,111	82.46	255	95.15	46	100.00	0	0.00	0	0.00
Total	**23,176**		**268**		**46**		**0**		**0**	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	17,216	74.28	123	45.90	5	10.87	0	0.00	0	0.00
Steel	110	0.47	0	0.00	0	0.00	0	0.00	0	0.00
Concrete	10	0.04	0	0.00	0	0.00	0	0.00	0	0.00
Precast	22	0.09	0	0.00	0	0.00	0	0.00	0	0.00
RM	15	0.06	0	0.00	0	0.00	0	0.00	0	0.00
URM	5,410	23.34	134	50.00	41	89.13	0	0.00	0	0.00
MH	393	1.70	11	4.10	0	0.00	0	0.00	0	0.00
Total	**23,176**		**268**		**46**		**0**		**0**	

*Note:
RM Reinforced Masonry
URM Unreinforced Masonry
MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 0 hospital beds available for use. On the day of the earthquake, the model estimates that only 0 hospital beds (0.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 0.00% of the beds will be back in service. By 30 days, 0.00% will be operational.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	0	0	0	0
Schools	16	0	0	16
EOCs	0	0	0	0
PoliceStations	3	0	0	3
FireStations	5	0	0	5

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component		Number of Locations			
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	44	0	0	44	44
	Bridges	69	0	0	69	69
	Tunnels	0	0	0	0	0
Railways	Segments	37	0	0	37	37
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	1	0	0	1	1
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	0	0	0	0	0
Ferry	Facilities	0	0	0	0	0
Port	Facilities	0	0	0	0	0
Airport	Facilities	0	0	0	0	0
	Runways	0	0	0	0	0

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	1	0	0	1	1
Waste Water	6	0	0	6	6
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	0	0	0	0	0
Communication	0	0	0	0	0

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	578	1	0
Waste Water	347	0	0
Natural Gas	231	0	0
Oil	0	0	0

Table 9: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	23,837	0	0	0	0	0
Electric Power		0	0	0	0	0

Induced Earthquake Damage

Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.00 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 77.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 120 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 2 households to be displaced due to the earthquake. Of these, 1 people (out of a total population of 59,003) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	**0**	**0**	**0**	**0**

Economic Loss

The total economic loss estimated for the earthquake is 0.35 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the earthquake. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the earthquake.

The total building-related losses were 0.04 (millions of dollars); 28 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 54 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.00	0.00	0.00	0.00	0.00
	Capital-Related	0.00	0.00	0.00	0.00	0.00	0.00
	Rental	0.00	0.00	0.00	0.00	0.00	0.00
	Relocation	0.00	0.00	0.00	0.00	0.00	0.01
	Subtotal	**0.00**	**0.00**	**0.01**	**0.00**	**0.00**	**0.01**
Capital Stock Losses							
	Structural	0.00	0.00	0.00	0.00	0.00	0.01
	Non_Structural	0.01	0.00	0.00	0.00	0.00	0.02
	Content	0.00	0.00	0.00	0.00	0.00	0.01
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	**0.02**	**0.00**	**0.01**	**0.00**	**0.00**	**0.03**
	Total	**0.02**	**0.00**	**0.01**	**0.01**	**0.00**	**0.04**

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	513.89	$0.00	0.00
	Bridges	107.69	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Subtotal	**621.60**	**0.00**	
Railways	Segments	65.42	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	2.66	$0.02	0.87
	Subtotal	**68.10**	**0.00**	
Light Rail	Segments	0.00	$0.00	0.00
	Bridges	0.00	$0.00	0.00
	Tunnels	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Bus	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Ferry	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Port	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
Airport	Facilities	0.00	$0.00	0.00
	Runways	0.00	$0.00	0.00
	Subtotal	**0.00**	**0.00**	
	Total	**689.70**	**0.00**	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.00	$0.00	0.00
	Facilities	35.00	$0.02	0.06
	Distribution Lines	11.60	$0.00	0.03
	Subtotal	**46.53**	**$0.02**	
Waste Water	Pipelines	0.00	$0.00	0.00
	Facilities	419.60	$0.26	0.06
	Distribution Lines	6.90	$0.00	0.02
	Subtotal	**426.52**	**$0.26**	
Natural Gas	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Distribution Lines	4.60	$0.00	0.01
	Subtotal	**4.63**	**$0.00**	
Oil Systems	Pipelines	0.00	$0.00	0.00
	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Electrical Power	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
Communication	Facilities	0.00	$0.00	0.00
	Subtotal	**0.00**	**$0.00**	
	Total	**477.68**	**$0.29**	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of $)

LOSS		Total	%

Appendix A: County Listing for the Region

Summit,OH

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Ohio					
	Summit	59,003	3,183	1,346	4,529
Total State		**59,003**	**3,183**	**1,346**	**4,529**
Total Region		**59,003**	**3,183**	**1,346**	**4,529**