

East Camp Creek Watershed Gallatin, Tennessee



US Army Corps
of Engineers
Nashville District

Section 205, Flood Risk Management

October 2018



EXECUTIVE SUMMARY

STUDY INFORMATION

The purpose of this report is to analyze potential solutions for flooding problems in the East Camp watershed, Gallatin, Tennessee. The report documents a Federal interest in implementation of a structural measure. This report has been prepared under the authority of Section 205 of the Flood Control Act of 1948, Pub. L. No. 80-858, as amended (codified at 33 U.S.C. § 701s), also referred to as Section 205 under the Continuing Authorities Program (CAP). The report presents the flood risk management (FRM) problems and opportunities within the East Camp Creek watershed as well as the measures and alternatives considered to reduce damages. The economic analysis for each management measure and alternative is documented and a tentatively selected plan (TSP) is recommended. The study was conducted in conjunction with the City of Gallatin, Tennessee (Gallatin) serving as the non-Federal sponsor (NFS) and the U.S. Army Corps of Engineers (USACE).

PROBLEM

The City of Gallatin experiences damages from flooding due to historic encroachment into the floodplain. This encroachment causes a loss of flood storage capacity and insufficient flow capacity or flow restrictions in the East Camp Creek Watershed. The area along Town Creek within the East Camp Creek Watershed is heavily urbanized and includes infrastructure associated with commercial, industrial, and residential developments. As the loss of floodplain storage in the watershed continues to increase, each major flood would incur damages to a larger number of structures resulting in a significant economic impact to the region.

OBJECTIVES

The objective of the study is to reduce flood risk and improve the overall quality of life for the residents of the City of Gallatin. The planning objectives are as follows:

- Reduce flood damages to structures located along Town Creek in Gallatin, TN by the year 2025, once the project is fully constructed and operational
- Reduce flood risk to critical infrastructure by the year 2025, once the project is fully constructed and operational

PLANS CONSIDERED

A wide variety of nineteen FRM measures were developed that would address one or more of the planning objectives. These measures were then screened for efficiency and acceptability. Five structural measures were evaluated in further detail along with the non-structural (NS) portion of the analysis. All structures in the inventory were analyzed to determine if they were being inundated by more frequent events. This exercise produced four residential structures which were analyzed in more detail. It was deemed that the NS portion of the analysis could not be economically justified. This process is described in detail in the Economic Appendix to this report. The final array of two measures were evaluated as alternatives. Ultimately, each measure was looked at individually as well as combining the two measures into a third alternative.

RECOMMENDED PLAN

The National Economic Development (NED) plan is the plan that provides the greatest net benefits to the nation. Entrance Detention is the plan that provides the greatest amount of net benefits. Entrance Detention maximizes net annual benefits and provides significant residual risk reduction while being cost effective. Entrance Detention includes an armored earthen detention structure that would store approximately 46 acre-feet of water near the entrance to Triple Creek Park. The City of Gallatin owns Triple Creek Park and both the structure and flowage easement needed would be contained within park property and several adjoining

private property parcels. There are no known cultural, environmental or hazardous, toxic radioactive waste (HTRW) issues with the project site. The City of Gallatin supports the project.

PROJECT IMPACTS

Due to the highly developed, urban environment of the project footprint, the resulting environmental impacts for most components of the selected plan are minimal.

BENEFITS AND COST

The recommended plan, Entrance Detention, has an investment cost at fiscal year (FY) 2018 price levels of \$1,921,000; an annual cost of \$76,800, including operations, maintenance, repair, rehabilitation and replacement costs (OMRR&R) and interest during construction; net annual benefits of \$79,100; and a benefit-to-cost ratio (BCR) of 2.0 at a discount rate of 2.750 percent, with a 50-year period of analysis and an eight-month construction period. The Entrance Detention produces \$155,900 in equivalent annual benefits. The fully funded total project cost is estimated to be \$2,034,000 with a sponsor contribution of \$712,000 and a Federal contribution of \$1,322,000. The sponsor is responsible for 100 percent of the OMRR&R costs.

TIMELINE

Final report approval is anticipated by March 2019. Pending appropriations, preconstruction, engineering, and design of the recommended plan is scheduled for completion in 2020 and construction of all measures could be completed by 2021.

TABLE OF CONTENTS

Executive Summary	i
Study Information	i
Problem	i
Objectives	i
Plans Considered.....	i
Recommended Plan	i
Project Impacts.....	ii
Benefits and Cost.....	ii
Timeline	ii
List of Figures	vi
List of Tables	vii
Appendices.....	vii
List of Acronyms	vii
1.0 Introduction*.....	1
1.1 Study Purpose and Scope.....	1
1.2 Location	1
1.2.1 Study Area	1
1.2.2 Project Area	1
1.3 Study Authority.....	5
1.4 Relevant Prior Studies and Reports	5
2.0 Affected Environment – Existing Conditions*	7
2.1 Climate.....	7
2.2 Soils and Geology	7
2.2.1 Geology and Physiography	7
2.2.2 Soil Associations.....	8
2.3 Surface Water and Other Aquatic Resources.....	9
2.3.1 Surface Water.....	9
2.3.2 Groundwater	9
2.3.3 Flood Plains	9
2.3.4 Wetlands	11
2.4 Fish and Wildlife Habitats	11
2.4.1 Aquatic Resources.....	11
2.4.2 Terrestrial Resources.....	11
2.5 Endangered and Threatened Species.....	12
2.5.1 Federal.....	12
2.5.2 State.....	12
2.5.3 Critical Habitat.....	12

2.6	Recreational, Scenic, and Aesthetic Resources	12
2.7	Cultural Resources	12
2.7.1	Cultural History.....	12
2.7.2	Previous Investigations	13
2.8	Air Quality	13
2.9	Noise	14
2.10	Hazardous, Toxic and Radioactive Waste (HTRW).....	14
2.11	Socioeconomic and Environmental Justices	15
2.11.1	EO 12898 Environmental Justice.....	15
2.11.2	EO 13045 Protection of Children.....	17
3.0	Plan Formulation.....	17
3.1	Problems and Opportunities.....	17
3.1.1	Planning Problems	17
3.1.2	Planning Opportunities	17
3.2	Objectives and Constraints.....	18
3.2.1	Planning Objectives	18
3.2.2	Planning Constraints	18
3.3	Most Probable Future Without Project Conditions.....	18
3.4	Measures to Achieve Planning Objectives.....	20
3.4.1	Preliminary Structural and Non-Structural Measures	20
3.4.2	Excluded Measures	22
3.5	Formulation and Comparison of Alternative Solution Sets*	23
3.5.1	Alternative Plan Descriptions	24
3.5.2	Comparison of Alternative Plans	24
3.6	Recommended Plan*	26
3.6.1	Recommended Plan Description	26
3.6.2	Risk and Uncertainty.....	32
3.6.3	Estimated Project Costs and Schedule	34
3.6.4	Performance under Benchmark Flood	35
3.6.5	Non-Federal Sponsor Responsibilities.....	37
4.0	Environmental Effects of Recommended Plan*	37
4.1	Flooding	38
4.2	Climate.....	38
4.2.1	Future Climate Impacts.....	38
4.3	Soils and Geology	45
4.4	Surface Waters and Other Aquatic Resources	46
4.4.1	Surface Water.....	46

4.4.2	Groundwater	48
4.4.3	Flood Plains	48
4.4.4	Wetlands	48
4.5	Fish and Wildlife Habitats	48
4.5.1	Aquatic Resources.....	48
4.5.2	Terrestrial Resources.....	48
4.6	Endangered and Threatened Species.....	49
4.6.1	Federal.....	49
4.6.2	State.....	49
4.6.3	Critical Habitat.....	49
4.7	Recreational, Scenic, and Aesthetic Resources.....	49
4.8	Cultural Resources	50
4.9	Air Quality	50
4.10	Noise	50
4.11	Utilities.....	50
4.12	Transportation	51
4.13	Hazardous and Toxic Substances.....	51
4.14	Socioeconomic and Environmental JUstices	52
4.15	Cumulative Effects.....	52
4.15.1	Past and Present Actions	52
4.15.2	Reasonably Foreseeable Future Actions	52
4.15.3	Combined Effects on Resources	52
5.0	Mitigation of Adverse Impacts*	52
6.0	Implementation Requirements	53
6.1	Project Partnership Agreement	53
6.2	Lands, Easements, Rights-of-way, Relocations and Disposal Areas.....	55
6.3	Operation, Maintenance, Repair, Replacement, and Rehabilitation	55
6.4	Regulatory Requirements*.....	55
6.4.1	Clean Water Act.....	55
6.4.2	Fish and Wildlife Coordination Act.....	56
6.4.3	Endangered Species Act.....	56
6.4.4	National Historic Preservation Act	56
6.4.5	Floodplain Management	56
7.0	Public Involvement*	57
7.1	Stakeholder Agency Coordination	57
7.1.1	Federal Agencies.....	57
7.1.2	State Agencies.....	58

7.1.3	Local Agencies.....	58
7.1.4	Tribes	58
7.1.5	Non-Governmental Organizations	59
8.0	FINDING OF NO SIGNIFICANT IMPACT	59
9.0	Recommendation*	59
10.0	List of Preparers.....	60
11.0	References.....	60

LIST OF FIGURES

Figure 1.	Gallatin Section 205 Location	2
Figure 2.	Gallatin City Limits	3
Figure 3.	East Camp Creek Watershed	4
Figure 4.	Station Camp Creek May 2010 Damage Locations and Magnitude	6
Figure 5.	Average Monthly Rainfall Data for Gallatin, TN.....	7
Figure 6.	Average High and Low Temperatures for Gallatin, TN.....	7
Figure 7.	Tennessee Geologic Provinces Map.....	8
Figure 8.	May 2010 Flood: Intersection of Hwy 31E and Riverbend Road	10
Figure 9.	May 2010 Flood: East of Eastland Street near North Water Street.....	10
Figure 10.	Wetland Maps.....	11
Figure 11.	Gallatin Historic Commercial District.....	13
Figure 12:	Projected Land Use in the Town Creek Watershed.....	19
Figure 13.	Structural Measures	21
Figure 14.	Detention Structures at Triple Creek Park.....	23
Figure 15.	Nicholas Lane Disposal Area	27
Figure 16.	On-Site Real Estate for TSP.	28
Figure 17.	Schematic of Entrance Detention Structure.....	29
Figure 18.	Plan View of Entrance Detention Structure.....	30
Figure 19.	Typical Sections for Entrance Detention Structure.	31
Figure 20.	Lower Town Creek Cross-Section with Future With and Without 100 Year Profiles	36
Figure 21:	Mid-Town Creek Cross-Section with Future With and Without 100 Year Profiles	36
Figure 22:	Upper Town Creek Cross-Section With Future With and Without 100 Year Profiles.....	37
Figure 23:	Summary Matrix of Observed and Projected Climate Trends.....	39
Figure 24:	Annual Peak Instantaneous Streamflow, East Fork Stone Near Lascassas, TN. $p = 0.44$	40
Figure 25:	Annual Peak Instantaneous Streamflow, Harpeth River at Bellevue, TN. $p = 0.15$	40
Figure 26:	HUC Location Map	41
Figure 27:	Projected Annual Max Monthly Analysis	41
Figure 28:	Mean Projected Annual Maximum Monthly Streamflow	42
Figure 29:	Nonstationarity Detention Results for the Harpeth River at Bellevue, TN (USGS 03433500)	42
Figure 30:	Graphical Representation of Nonstationarity at Harpeth River at Bellevue, TN (USGS 3433500)	43
Figure 31:	Nonstationarity Detention Results for East Fork Stone Near Lascassas, TN (USGS 3427500).....	43
Figure 32:	Graphical Representation of Nonstationarity at East Fork Stone Near Lascassas, TN (USGS 3427500)	44
Figure 33:	Twenty Percent (20%) Most Vulnerable HUCs in the Nation	44
Figure 34:	Summary of Flood Risk Reduction HEC results.....	45
Figure 35.	Upstream Velocities	47
Figure 36.	Downstream Velocities.....	47

LIST OF TABLES

Table 1. May 2010 Estimated Flood Damages by Category Based on the May 2010 Post-Flood Report ...	5
Table 2. Summary of Population Demographics	16
Table 3. Income Distribution Summary	17
Table 4. Age Distribution Summary	17
Table 5. Initial Measures Identified	20
Table 6. Plan Comparison	25
Table 7. Estimated Flood Risk Management Benefits.....	25
Table 8. Preliminary Estimated Average Annual Costs.....	25
Table 9. Preliminary Cost-Benefit Analysis	26
Table 10. Probability and Consequence Ratings	32
Table 11. Summary of Key Assumptions and Associated Risks	32
Table 12. Estimated Project Costs and Apportionment	34
Table 13. Implementation Schedule.....	35
Table 14. Eight Steps of Decision Making Process in EO 11988.....	57
Table 15. Gallatin 205 PDT	60

APPENDICIES

A- H&H.....	Available Upon Request
B- Civil Design.....	Available Upon Request
C- HTRW.....	Available Upon Request
D- Real Estate.....	Available Upon Request
E- Cost Estimate.....	Available Upon Request
F- Economics.....	Available Upon Request
G- Environmental	
H- Cultural	
I- Risk Register.....	Available Upon Request

LIST OF ACRONYMS

AEP	- Annual Exceedance Probability
APE	- Area of Potential Effect
BCR	- Benefit-to-Cost Ratio
BMP	- Best Management Practices
CAP	- Continuing Authorities Program
CEQ	- Council of Environmental Quality
CERCLA	- Comprehensive Environmental Response, Compensation, and Liability Act
C.F.R.	- Code of Federal Regulations
DPR	- Detailed Project Report
EA	- Environmental Assessment
EO	- Executive Order
EPA	- U.S. Environmental Protection Agency
ESA	- Environmental Site Assessment
FCSA	- Feasibility Cost Share Agreement
FPMS	- Floodplain Management Services
FRM	- Flood Risk Management
FWCA	- Fish and Wildlife Coordination Act

FY	-	Fiscal Year
Gallatin	-	City of Gallatin, Tennessee
H	-	Horizontal
HEC-FDA	-	Hydrologic Engineering Center Flood Damage Analysis
HEC-FIA	-	Hydrologic Engineering Center-Flood Impact Analysis
HTRW	-	Hazardous, Toxic, Radioactive Waste
HUC	-	Hydrologic Unit Code
HVAC	-	Heating, Ventilation and Air Conditioning
LERRD	-	Lands, Easements, Rights-of-Way, Relocations and Disposal Areas
LOI	-	Letter of Intent
LRD	-	Lakes and River Division
LRN	-	Nashville District
NED	-	National Economic Development
NEPA	-	National Environmental Policy Act
NFS	-	Non-Federal Sponsor
NHPA	-	National Historic Preservation Act
NOAA	-	National Oceanic and Atmospheric
NPDES	-	National Pollutant Discharge Elimination System
NRHP	-	National Register of Historic Places
NS	-	Nonstructural
O&M	-	Operation and Maintenance
OMRR&R	-	Operation, Maintenance, Repair, Rehabilitation and Replacement
PAA	-	Proposed Action Alternative
PDT	-	Project Delivery Team
P.L.	-	Public Law
POL	-	Policy and Planning
PPA	-	Project Partnership Agreement
RE	-	Real Estate
REC	-	Recognizable Environmental Condition
SHPO	-	State Historic Preservation Officer
SID	-	Structure Inventory Database
TDEC	-	Tennessee Department of Environment Conservation
THC	-	Tennessee Historic Commission
TSP	-	Tentatively Selected Plan
TWRA	-	Tennessee Wildlife Resource Agency
USACE	-	U.S. Army Corps of Engineers
USFWS	-	U.S. Fish and Wildlife Service
USGS	-	U.S. Geologic Survey
V	-	Vertical
WRDA	-	Water Resources Development Act

1.0 INTRODUCTION*

1.1 STUDY PURPOSE AND SCOPE

This detailed project report (DPR), which includes a draft environmental assessment (EA), has been prepared by the USACE Nashville District (LRN) to identify the most effective alternative while minimizing environmental, economic, and social impacts for the proposed flood damage reduction project located on the Town Creek and its tributaries in the City of Gallatin, Tennessee. The City of Gallatin is the non-Federal sponsor.

The East Camp Creek basin has a long history of flood damages. Flooding occurred in 1926, 1975, 1978, and 2010. Less widespread, more localized flooding also occurs throughout the basin at greater frequencies. Flooding can be the result of widespread major rain events or small intense storms and thunderstorms.

Flooding occurs throughout the East Camp Creek watershed with the major damage centers being on Town Creek, East Camp Creek's major tributary. The largest damage center, the one of most concern to the City of Gallatin, Tennessee, is the downtown area. Town Creek flows through the City of Gallatin along Highway 31E. The Gallatin Section 205 study would focus on East Camp, Town Creek, and Town Creek Tributary 1 and Tributary 2 (two lesser unnamed tributaries).

The primary purpose of this study is to develop a viable flood damage reduction solution for the protection of the flood prone areas along Town Creek in the City of Gallatin.

1.2 LOCATION

1.2.1 Study Area

The City of Gallatin is located in Middle Tennessee in Sumner County. The city lies 25 miles north of Nashville. The population of the City of Gallatin in 2013 was 32,307. The East Camp Creek watershed lies in the southeastern part of Sumner County covering a total of 46.2 square miles in U.S. Geologic Survey (USGS) Hydrologic Unit Code (HUC) 051302010604 (Figure 1). The City of Gallatin is located on Town Creek. East Camp Creek is a tributary of the Cumberland River (Old Hickory Reservoir) at Mile 236.6.

1.2.2 Project Area

The City of Gallatin requested assistance to reduce future flood damages in the East Camp Creek watershed, USGS HUC 051302010604, through a letter of intent (LOI). The initial LOI was received from Mayor Graves of the City of Gallatin on August 19, 2010. An additional LOI, reconfirming the city's interest in project participation, was received from Mayor Brown on April 16, 2015. A site visit was performed in April 2015. Representatives from the City of Gallatin were present as well as LRN Environmental, Water Resources, Economics and Plan Formulation project delivery team (PDT) members. All major sites were visited and flooding problems were discussed with local officials. It was determined during these meetings that modeling would be created for a flood insurance study (FIS) update for East Camp Creek, Town Creek, Town Creek Tributary 1 and Town Creek Tributary 2. It was also requested by the City of Gallatin to only look at flood reduction measures on Town Creek since it was the main damage center of concern. Historic photographic evidence, scour and documentation demonstrate the history of flooding.

Figure 1. Gallatin Section 205 Location

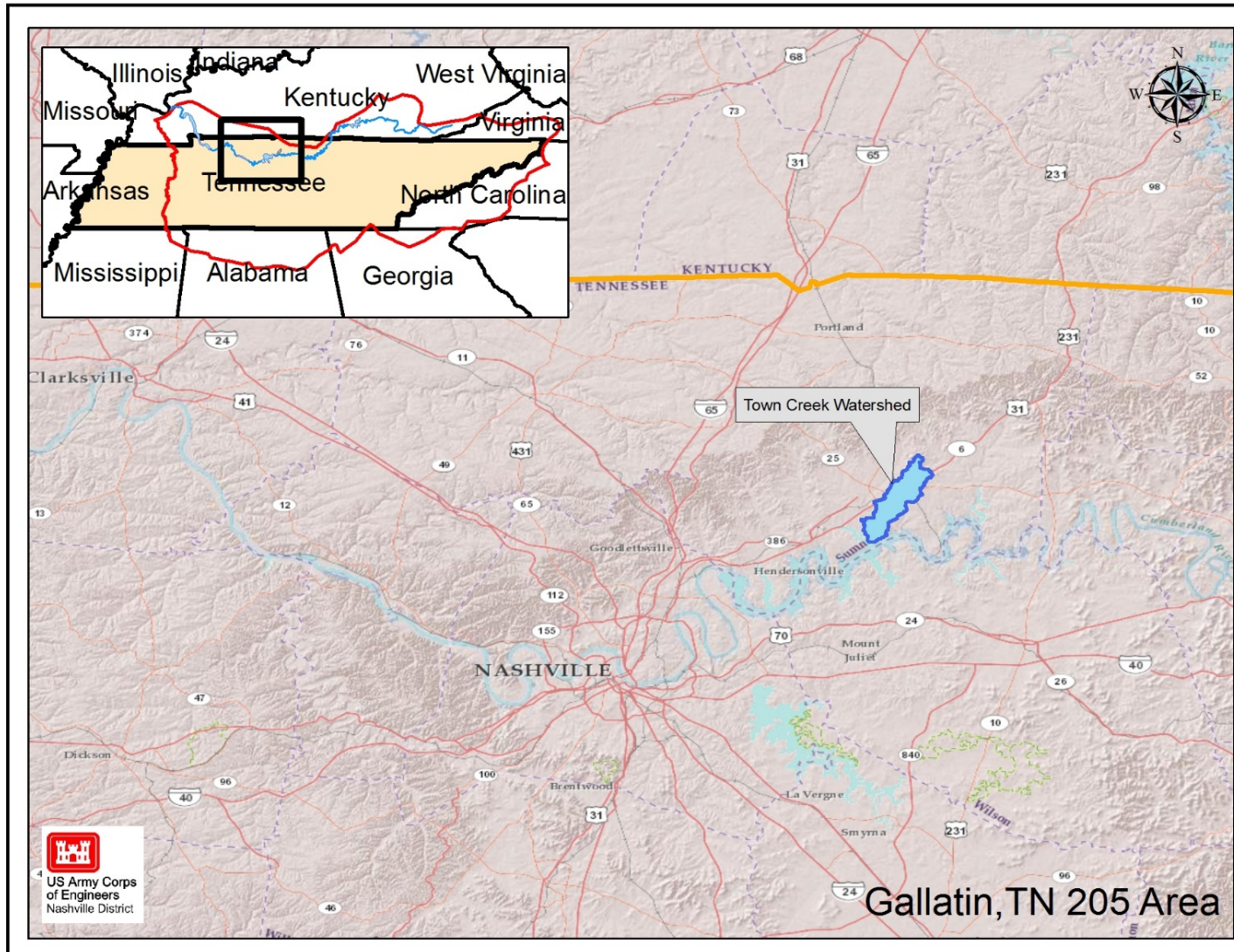


Figure 2. Gallatin City Limits

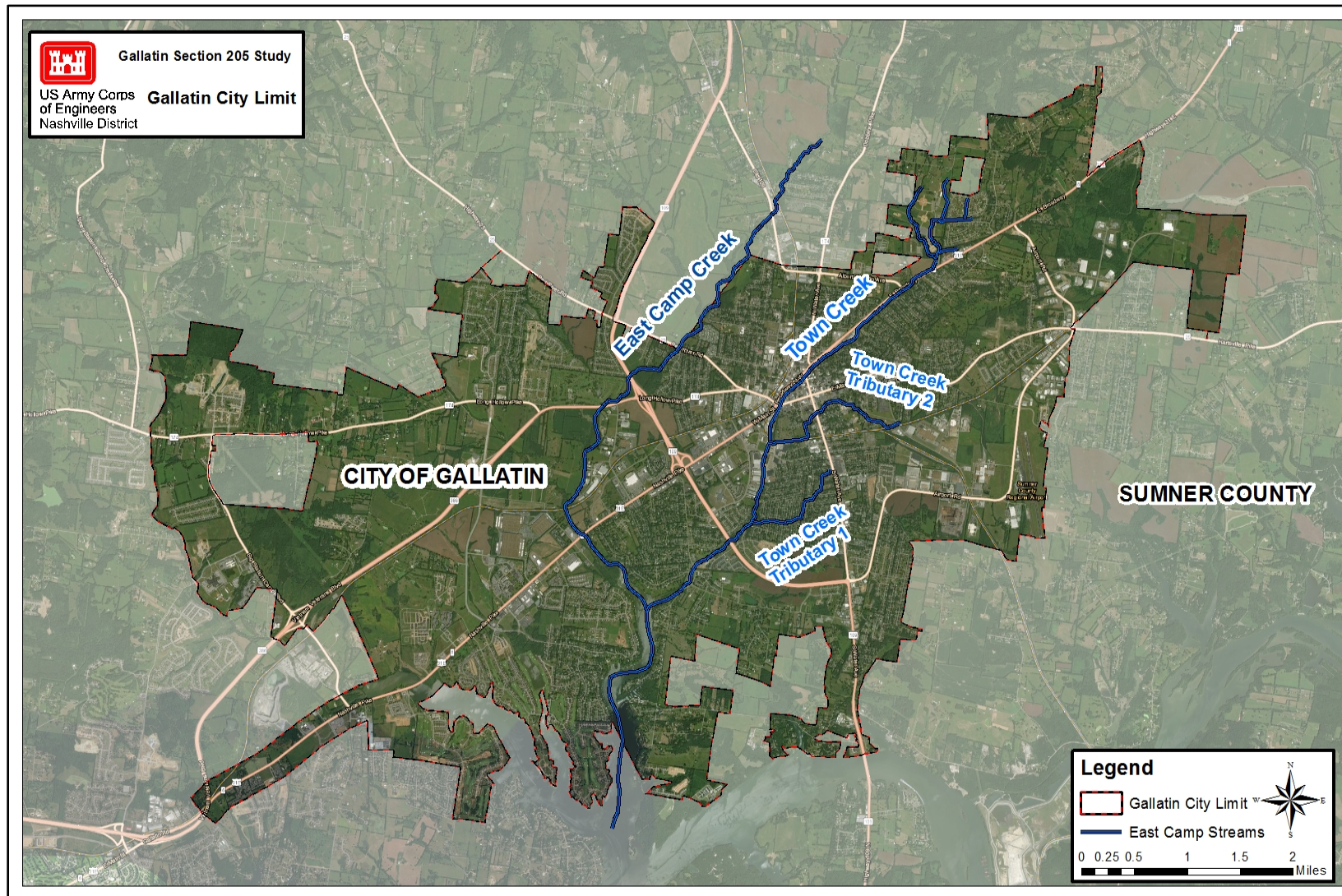
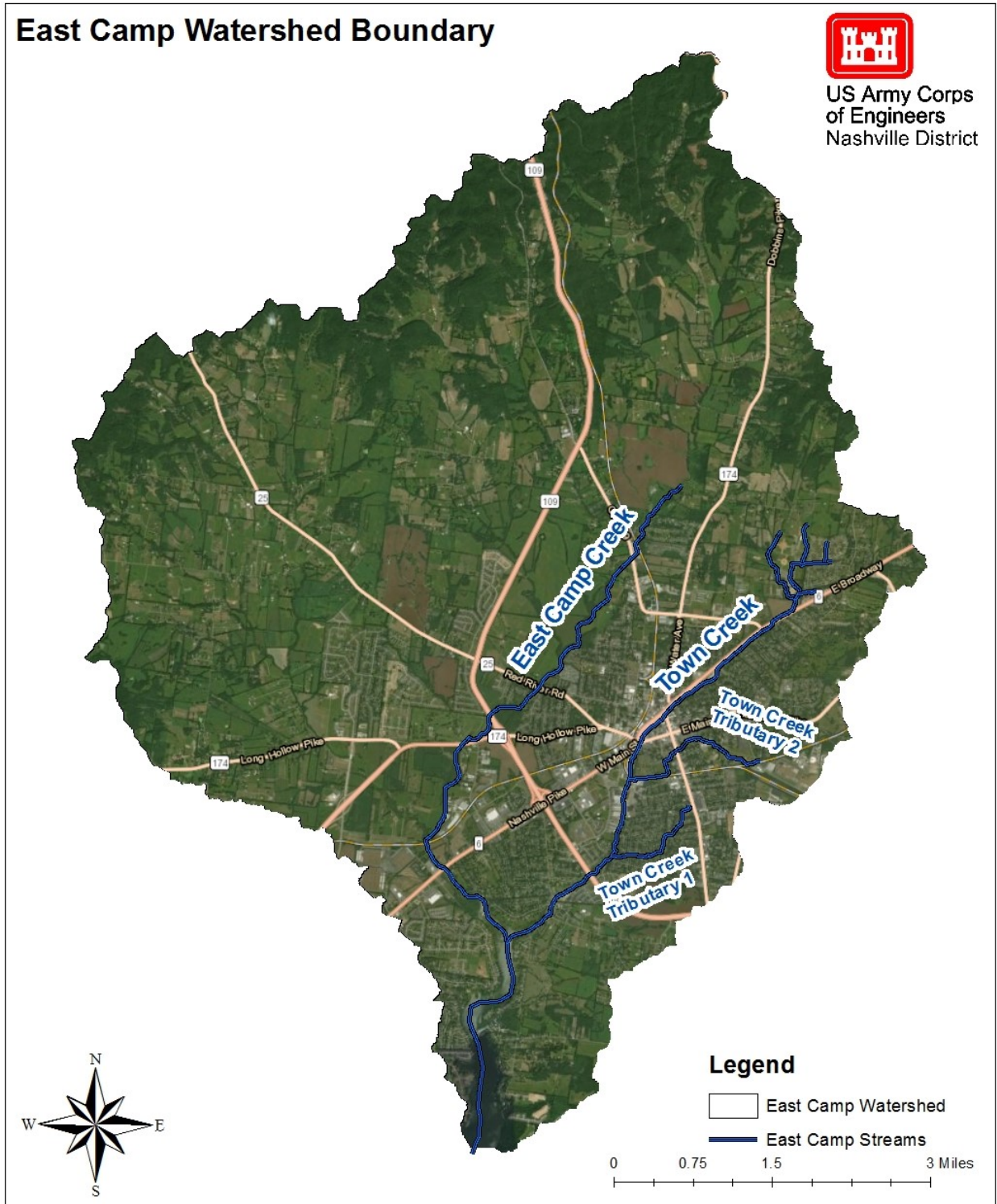


Figure 3. East Camp Creek Watershed



1.3 STUDY AUTHORITY

The authority for this study is Section 205 of the Flood Control Act of 1948, Pub. L. No. 80-858, as amended (codified at 33 U.S.C. § 701s). Projects implemented under this authority are formulated for structural or non-structural measures for flood damage reduction in accordance with current policies and procedures governing projects of the same type which are specifically authorized by Congress (see Section III of Appendix E of this regulation).

1.4 RELEVANT PRIOR STUDIES AND REPORTS

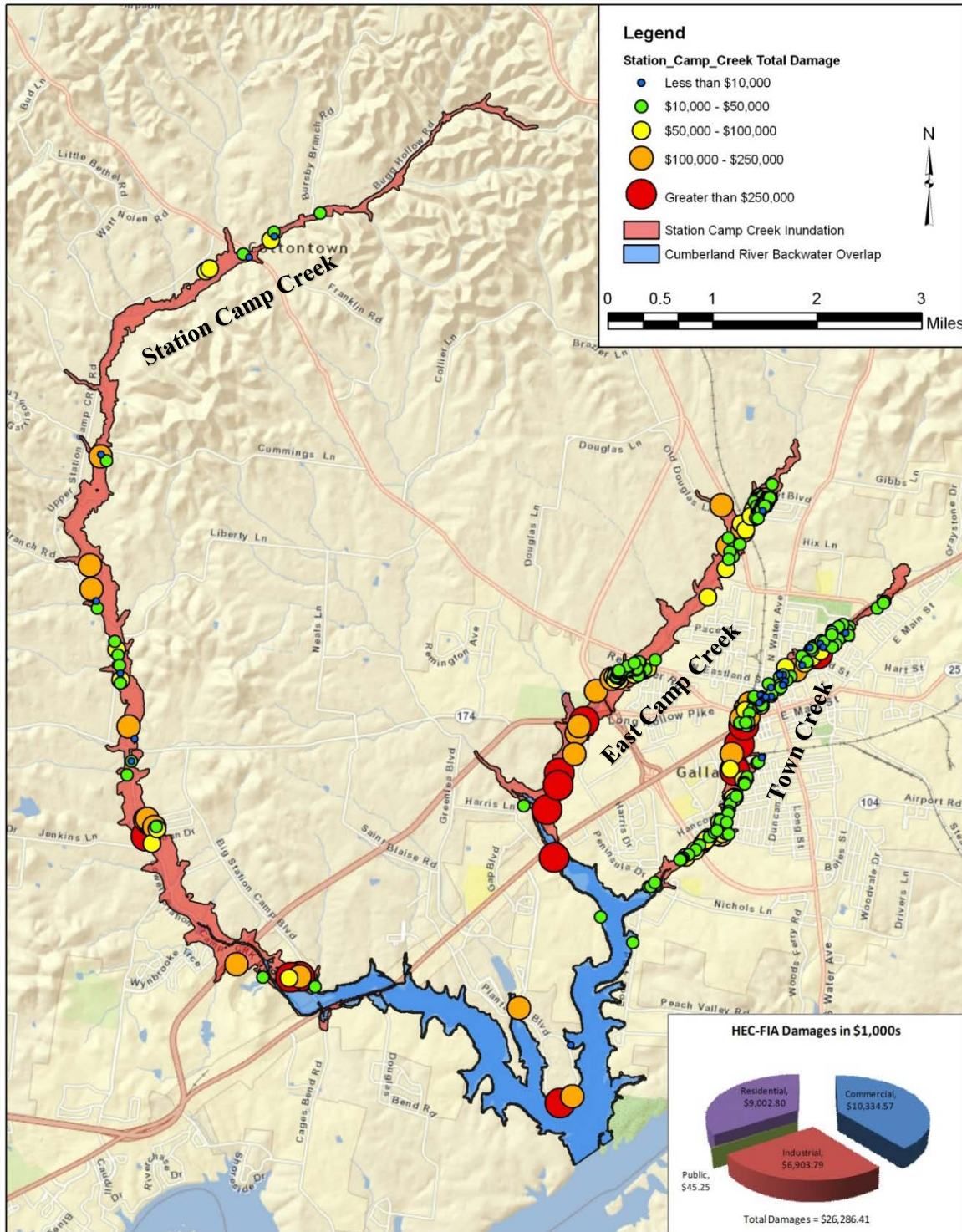
The Nashville District has conducted previous studies in Gallatin, Tennessee. The following studies were utilized to build the federal interest determination under the Section 205 study authority and to assist with development of this decision document:

- May 2010 Post Flood Report: Approved 14 February 2012 – USACE LRN
- Town Creek Watershed Flood Risk Management Flood Plain Management Services (FPMS) Study: December 2012 – USACE LRN
- Supplemental Flood Preparedness Products: 2013 – USACE LRN

Table 1. May 2010 Estimated Flood Damages by Category Based on the May 2010 Post-Flood Report

East Camp Creek Basin			
May 2010 Estimated Flood Damage			
\$'s = FY 2015, 1,000's			
Structure Damage	Content Damage	Vehicle Damage	Total Damage
10,289	14,734	2,222	27,245

Figure 4. Station Camp Creek May 2010 Damage Locations and Magnitude



Note: Inundation area developed and shown only for study streams. Additional flooding may have been experienced outside the study areas.

2.0 AFFECTED ENVIRONMENT – EXISTING CONDITIONS*

This section of the report depicts pertinent readily available information by resource topic. The subsections characterize existing conditions and provide a basis to identify direct and indirect benefits and impacts to the local and regional area by implementation of alternatives considered as identified in Section 4.0 of this report.

2.1 CLIMATE

The average temperature in Gallatin is 60.4°F and average annual precipitation is 52.33 inches according to National Oceanic and Atmospheric Administration (NOAA) data. Figure 5 shows monthly average rainfall and Figure 6 shows average temperature.

Figure 5. Average Monthly Rainfall Data for Gallatin, TN

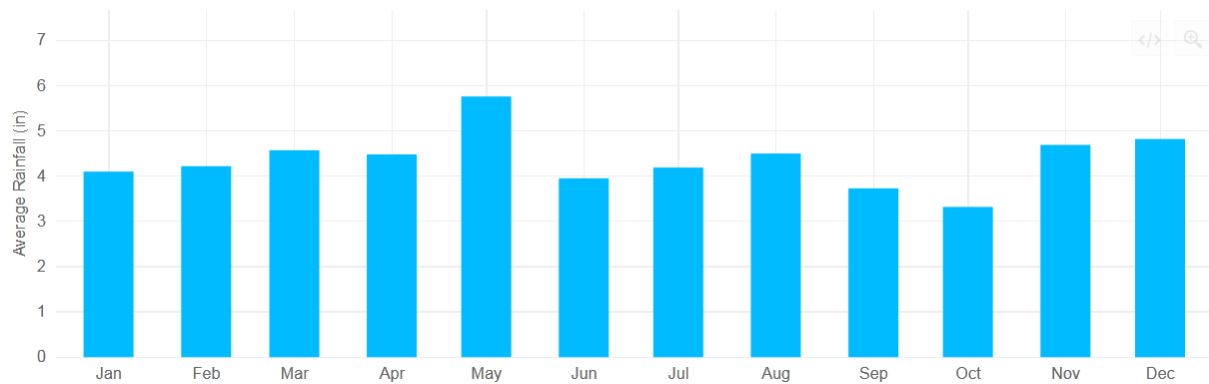
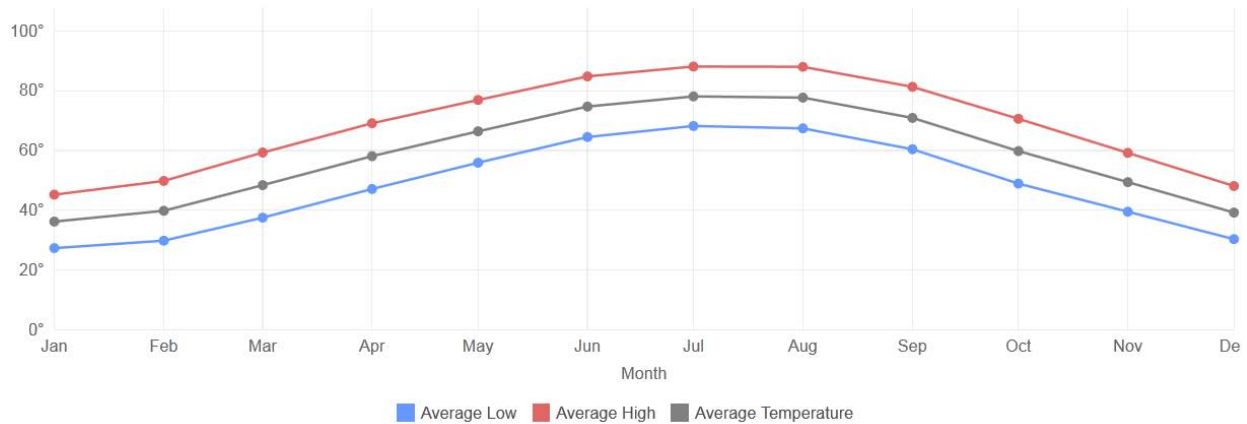


Figure 6. Average High and Low Temperatures for Gallatin, TN



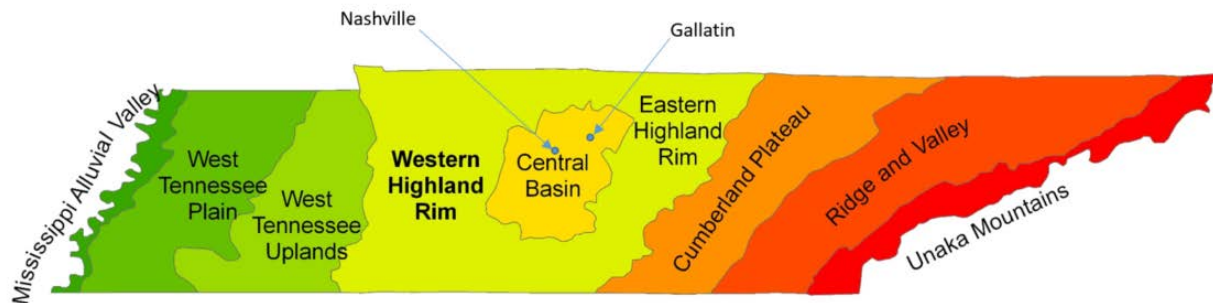
2.2 SOILS AND GEOLOGY

2.2.1 Geology and Physiography

The City of Gallatin is located in Sumner County, Tennessee. Gallatin lies inside of the Central Basin within the Central Highlands Province. This region is composed of a topographic basin and a structural dome (Nashville Dome) and lies about 400 feet below the surrounding Highland Rim Region. The highest

structural part of the dome (where the oldest rocks in the Central Basin are exposed) is located in Rutherford County, approximately 30 miles south of Gallatin.

Figure 7. Tennessee Geologic Provinces Map



The topography of the Central Basin Region ranges from flat gladelands, gently rolling hills, and wide stream valleys to rugged, hilly topography near the surrounding Highland Rim areas. The elevations within the region range from 500 feet to more than 800 feet, excluding erosional remnants of the surrounding Highland Rim, which are more than 1,000 feet in elevation.

Erosional remnants of the Highland Rim extend into the Central Basin, indicating that the entire Central Basin once was overlain by younger rocks of the Highland Rim. These erosional remnants, formed by the resistant formations of Mississippian age, produced the rugged, hill topography that characterize areas to the east of Lebanon as you approach the Eastern Highland rim.

Geologic structure within the Central Basin is dominated by the Nashville dome, and minor faults and folds in the province apparently are related genetically to the dome. In general, the bedrock formations dip away from the central area of the dome at about 20 feet per mile.

Surface formations throughout most of the Central Basin are Ordovician Limestone; Devonian formations (mostly limestones and shales) are present along the slopes that separate the Central Basin from the Eastern Highland Rim. The geology is very karst in areas providing a good environment for sink holes.

2.2.2 Soil Associations

Soils within Sumner County, Tennessee area can vary greatly from soils that are classified as hydric to upland soils. This area consists primarily of Harpeth-Mimosa-Arrington Association and Mimosa-Harpeth Association. The Harpeth-Mimosa-Arrington Association is described as very deep and deep, nearly level to rolling, well-drained soils that have a loamy surface layer and a loamy or clayey subsoil formed in old alluvium, overlying residuum derived from limestone, in residuum derived from limestone, or in recent alluvium. The Mimosa-Harpeth Association consist of deep to very deep, undulating to hilly, well-drained soils that commonly have a loamy surface layer and a clayey subsoil, formed in residuum derived from limestone or alluvium and loess overlying residuum derived from limestone.

More specifically, the Natural Resources Conservation Service, soil survey in the area Triple Creek Park, Gallatin, TN reveals that the project area consists of Arrington silt loam, Mimosa silt loam and Armour silt loam soils. Arrington silt loam is a fertile, well-drained soil generally comprising stream terraces with a depth to rock typically greater than 6 feet. Mimosa silt loam is a well-drained soil typically constituting escarpment landforms. These soils usually have a significant clay content and generally yield a depth to rock between 3–6 feet. Armour silt loam is a well-drained and very fertile soil. It is comprised of stream terrace landforms, and the depth to rock in these soils is generally greater than six feet.

2.2.2.1 Hydric Soils

Constructing the proposed project near the entrance of Triple Creek Park will necessitate the removal of existing soils in and along the footprint of the project structures. Hydric soils are not anticipated to be encountered during the construction phase of the project. In the event that hydric soils are encountered at the project, they would be undercut, removed, properly disposed and replaced with suitable material.

2.3 SURFACE WATER AND OTHER AQUATIC RESOURCES

2.3.1 Surface Water

The East Camp Creek watershed lies in south central Sumner County, covering 46.2 square miles. East Camp Creek is a tributary of the Cumberland River at Mile 236.6 (Old Hickory Reservoir), 20 miles upstream of Old Hickory Dam. East Camp Creek's major tributaries are Town Creek, Liberty Branch, East Camp West Tributary and Wallace Branch. The East Camp Creek watershed is bounded on the east by the Bulls Creek, Sink Hole Creek, Albright Creek, and Bledsoe Creek basins, all tributaries of the Cumberland River; on the west by Station Camp Creek basin, also a tributary of the Cumberland River; and on the south by the Cumberland River. To the north lies the divide of the Highland Rim. Water to the south of the divide flows to the Cumberland River; water to the north of the Ridge flows to the Barren River in Kentucky.

2.3.2 Groundwater

Groundwater quality in the area of the project is unknown. According to the USGS Ground Water Atlas of the United States (2000), the project area is not located in an area identified as an aquifer.

2.3.3 Flood Plains

The existing flood insurance study (FIS) for Sumner County was completed 17 April 2012. The 2012 study was a remapping only and did not include any hydrologic or hydraulic modeling updates. New hydrologic and hydraulic analyses for East Camp Creek were completed in October 2010. The tributaries to East Camp Creek were studied at previous dates. Cross-sections for East Camp Creek and Town Creek were taken from the March 1976 Flood Insurance Study report, published by FEMA, on Sumner County, Tennessee and supplemented with additional cross-sections surveyed in 1977. Cross-sections for all other streams studied in detail were surveyed in 1977.

The most recent major flood occurred during May 2010. The flood followed a historic two-day rainfall with a statistical precipitation recurrence interval of greater than the 1% annual chance flood. Rainfall on May 1 and 2 resulted in record flood stages in the East Camp Creek watershed. Radar rainfall in the East Camp Creek watershed ranged from 9 to 12 inches. Figure 8 and Figure 9 show the devastation of the May 2010 event.

The Nashville District prepared a Post-Flood Technical Report after the May 2010 event, which included Station Camp Creek Basin (East Camp Creek is in the Station Camp Creek Basin). LRN utilized the Hydrologic Engineering Center-Flood Impact Analysis model (HEC-FIA) to estimate the event damage caused by the flood. This modeling indicates that 389 structures were damaged in the East Camp Creek watershed during the May 2010 flood, resulting in a total damage of over \$27.2M in fiscal year (FY) 2015 dollars.

In addition to the aforementioned quantifiable damages, there are also non-measurable concerns in the East Camp Creek watershed. Due to the nature of the runoff and the layout of the city's infrastructure, the City of Gallatin's emergency response units have become inaccessible to many parts of the area even in frequent flooding events.



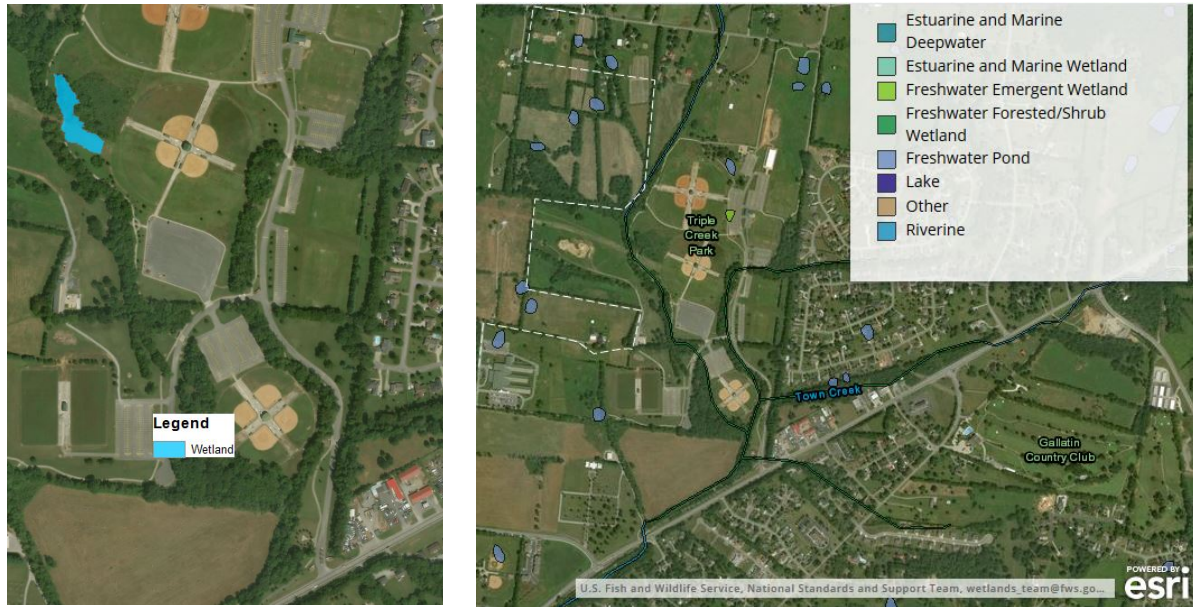
Figure 9. May 2010 Flood: East of Eastland Street near North Water Street



2.3.4 Wetlands

According to USFWS National Wetland Inventory maps, there are very few wetlands that occur in the project footprint. At Triple Creek Park, there is one freshwater emergent wetland that is indicated to have occurred where there is currently a paved parking lot. Otherwise, there are a number of farm ponds and one freshwater forested/shrub wetland that occur on top of the tributary corridor. A USACE biologist conducted a site visit on July 10, 2017. Only one wetland was delineated within the study area. The wetland is approximately 1.72 acres in size and is situated between the paved trail and large fill area or berm (Figure 10. Wetland Maps). The northern portion of the wetland (approximately 0.92 acre) is forested and the southern portion is apparently mowed on at least an annual basis and exhibits emergent vegetation.

Figure 10. Wetland Maps



2.4 FISH AND WILDLIFE HABITATS

2.4.1 Aquatic Resources

Town Creek and two unnamed tributaries are located within the recommended project area (Figure 3). In general, the streams are incised between 3–6 feet with very little access to adjacent floodplains, except during flood events. The streams’ transition from the channel directly to uplands (vertical banks) is likely due to past channelization/grading and stream incision. Town Creek and one of the unnamed tributaries showed constant flow during the study period and throughout the study reaches and appear to be perennial streams. Substrate in the streams consist primarily of bedrock with some reaches collecting cobble and small boulders on top of the bedrock. No existing data regarding fauna such as fish or invertebrate species is known regarding the stream.

2.4.2 Terrestrial Resources

Riparian corridors (vegetated zone immediately adjacent to the stream) were narrow, dominated in the understory by common privet (*Ligustrum vulgare*) and bush honeysuckle (*Lonicera maackii*). Other species found within the riparian zone are Hackberry (*Celtis occidentalis*), American elm (*Ulmus americana*), Green Ash (*Fraxinus pennsylvanica*), Box elder (*Acer negundo*), Cottonwood (*Populus deltoides*), Red cedar (*Juniperus virginiana*), Black Cherry (*Prunus serotina*), Chestnut oak (*Quercus montana*), Honey locust (*Gleditsia triacanthos*), Black walnut (*Juglans nigra*), Sassafras (*Sassafras albidum*), Osage orange (*Maclura pomifera*), Mulberry (*Morus rubra*), and Redbud (*Cercis canadensis*). The remaining areas of

Triple Creek Park are manicured turf grasses, recreational ball fields, and parking lots. Wildlife use of the riparian is likely limited to common urban species due to the significant amount of disturbance.

2.5 ENDANGERED AND THREATENED SPECIES

2.5.1 Federal

The U.S. Fish and Wildlife Service (USFWS) stated in a letter dated 11 August 2017 that their database does not indicate any known records of federally listed species occurring within the East Camp Creek watershed. However, the project would occur within the summer range of the federally endangered Indiana bat (*Myotis sodalis*) and federally threatened northern long-eared bat (*Myotis septentrionalis*). During a site visit on 10 July 2017, USACE biologists identified potential bat habitat. Eleven trees within the study area were identified as potential habitat for Indiana bat or Northern long-eared bat. Nine of the trees were snags (standing dead tree), and two were live trees that contained sections of exfoliated bark (bark hanging loose from the tree).

2.5.2 State

No state listed species are known to occur in the study area. To date, no correspondence has been received from the Tennessee Wildlife Resources Agency (TWRA).

2.5.3 Critical Habitat

No critical habitat is known to occur in the study area.

2.6 RECREATIONAL, SCENIC, AND AESTHIC RESOURCES

According to the City of Gallatin's Parks and Recreation website, Triple Creek Park is the city's largest park. It contains 185 acres, including two football fields, four youth softball fields, four adult softball fields, four baseball/softball all-purpose fields, 12 soccer fields, a playground, an 18-hole Frisbee golf course, a walking trail (10-foot wide concrete), dog park, covered pavilion, and two picnic pavilions. It is open until 11:00 pm during the summer months and 7:00 pm in the winter.

2.7 CULTURAL RESOURCES

2.7.1 Cultural History

The City of Gallatin was founded in 1802 and named after Albert Gallatin, who had once served as the Secretary of Treasury to Presidents Thomas Jefferson and James Madison. The City of Gallatin has a historic commercial district which has been listed in the National Register of Historic Places (NRHP) since 1985 (Figure 11). There are 37 properties listed in the National Register of Historic Places within Sumner County, 15 of which are located within 5 miles of Gallatin. Three NRHP-listed historic properties are situated within the primary city limits of Gallatin along Main Street. No historic properties listed or eligible for listing in the NRHP would be affected by the proposed undertaking.

The study area has been continuously occupied by Native Americans dating as far back to the Paleo-Indian Period 12,000 years Before Present (B.P.). The Cumberland River provided an excellent source of subsistence food resources ranging from a diverse array of fresh water mussels and fish species to an abundance of wild game that thrived along the floodplain margins. Numerous pre-historic archaeological sites exist along the Cumberland River and its minor tributaries. The floodplains were also very rich in nutrients that allowed for intensive agricultural practices to form and give rise to complex societies. The Mississippian Period (1100 to 400 B.P.) reflects the height of Native American presence in the Mississippi River Valley that spanned from the Mississippi River Delta to as far north as Chicago, IL and included the Cumberland River basin of Nashville, TN.



2.7.2 Previous Investigations

A search of site files and records at the Tennessee Division of Archaeology conducted on 26 June 2017 indicates three previous archaeological surveys were conducted of the project area. Two archaeological surveys were conducted between 1998–2001 (Christopher M. Hazel, and Duvall & Associates), in conjunction with the development of Triple Creek Park. A third archaeological investigation was conducted in 2012 (Andrea Crider) in conjunction with a natural gas line replacement. The investigations identified four archaeological sites within the project area, but none fell within the physical area of potential effect (APE). Three sites were determined not eligible for listing in the NRHP. The fourth is recorded as "potentially eligible" for listing in the NRHP. This site lies well beyond the boundaries of the physical APE and would not be affected by the proposed project.

2.8 AIR QUALITY

The U.S. Environmental Protection Agency (USEPA) is required to set air quality standards for pollutants considered harmful to public health and welfare. The primary National Ambient Air Quality Standards (NAAQS) set limits to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards set limits to protect public welfare, including protection against decreased visibility, and prevention of damage to animals, crops, vegetation, and buildings. These standards have been established for the following six pollutants, called criteria air pollutants (as listed under Section 108 of the Clean Air Act (CAA), 42 U.S.C. § 7408): carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), ozone (O₃), particulate pollution (PM_{2.5} and PM₁₀), and sulfur dioxide (SO₂).

According to USEPA, the City of Gallatin and Sumner County are considered in attainment of all air quality standards.

2.9 NOISE

Existing noise in the study area is associated with background traffic noises from major roads in the area, including Gallatin Pike/Highway 31. Also, noise associated with the recreational ball fields can be heard at any given time during open hours.

2.10 HAZARDOUS, TOXIC AND RADIOACTIVE WASTE (HTRW)

A preliminary Environmental Site Assessment (ESA) was conducted in March 2016, consisting of a site reconnaissance and an environmental historical document search, for the potential structural measures: Touchdown Detention Structure, Champion Detention Structure, Krystal Bridge Removal, Locust Ave Bridge Removal, and the Downtown Bank Modification. The purpose of the preliminary ESA was to identify potential recognized environmental conditions (REC) that may impact whether or not a measure would move forward. No potential RECs were identified at either the Touchdown or Champion Detention Structures, as they are both located in a city park that was formerly rural farmland prior to being acquired by the City of Gallatin. All other measures were located in or near downtown Gallatin, which increases the likelihood of potential RECs because of the large number of gas stations, auto repair facilities, and dry cleaners typically located in urban settings. Potential RECs were identified at the Downtown Bank Modification and the Krystal Bridge Removal measure. Along the right bank of Town Creek (Downtown Bank Modification) are several current and former auto repair facilities as well as gas stations. Within the Krystal Bridge removal proposed project footprint, a Firestone Auto Care facility is located along the left bank of Town Creek at 242 West Main Street. This Firestone is listed as a historical auto repair facility as well as a Resource Conservation and Recovery Act (RCRA) non-generator. The facility is also listed on the leaking underground storage tank (UST) registry and historical UST registry. As each measure was studied, the potential for environmental conditions were analyzed. After considering all benefits and impacts associated with each measure, only one measure, the Entrance Detention Structure, was selected to move forward.

A Phase Ia Environmental Site Assessment (ESA) was conducted for the proposed Entrance Detention Structure within the Triple Creek Park Complex in Gallatin, Tennessee. This ESA was performed to determine if there is any known environmental liability or REC that would interfere with implementation of the flood control project. A Phase Ia is an abbreviated Phase I ESA that fulfills many components of the regulation, 40 C.F.R. part 312, containing the standards and practices for all appropriate inquiries, but does not qualify for the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) landowner liability protections, because a full historic deed search where practicable, as prescribed in 40 C.F.R. part 312, has not been conducted for the proposed measure. Only the current deed has been reviewed for this measure.

A site reconnaissance was conducted 3 August 2017, and no RECs were observed. To the south of the proposed measure is East Broadway/Gallatin Pike, to the east is Champion Drive and a small commercial area, including an auto repair facility and gas station, to the west is a combination of farm land as well as Triple Creek Park, and to the north is Triple Creek Park. At the proposed site, Triple Creek runs from the north to the south. No discoloration or sheen was observed in Triple Creek adjacent to this site. There was no visual evidence of an environmental condition in the creek, creek bank, or proposed project area. Photos of the Entrance Detention Structure site and surrounding area are in Appendix B of the Phase Ia ESA report located in Appendix C of this report.

USACE contracted EDR Inc. to perform a standard environmental database records search for the Entrance Detention Structure and surrounding area. A radius of up to one-mile from the structural measures in accordance with ASTM E1527-13 (standard practice for Phase I ESAs) was reviewed. Only one

environmental record was identified within a 1-mile radius of the proposed Entrance Detention Structure. Adjacent to the east is a commercial area including an auto repair facility and gas station. The gas station, 31E Market, had suspected releases due to two consecutive inconclusive readings during the statistical inventory reconciliation. Common inconclusive results are due to poor measurements, miss-calibrated equipment, or missed deliveries. No confirmation of a release was reported and the status of the suspected releases was closed. Because there is no confirmed release, the 31E Market is not believed to be a REC which may impact the proposed Entrance Detention Structure.

Historic records, including Sanborn Insurance Maps, topographic maps, aerial photographs, and city directories, were searched as a part of this Phase Ia ESA. No historic Sanborn Insurance Maps were identified for the Entrance Detention Structure area. This is likely a result of the area never being highly developed into a commercial or dense residential area prior to 1977. Topographic maps and aerial photographs indicate the proposed project site was not developed and had no buildings or roads prior to the city park. Through the history of the city directories for Triple Creek Park and vicinity, the area has been predominately rural and residential. No RECs were identified from any of these historic records.

The current deed for Triple Creek Park is from 26 September 1997 when Elmer F. Hargis conveyed the property to the City of Gallatin. Only this deed was reviewed for environmental liens and covenants. This is a data gap for this report, but is unlikely to impact the conclusion because the current deed should contain any and all historic environmental liens or covenants. If there were any environmental covenants in the historic deeds, the covenants should carry over to the current deed unless it was legally removed from the deed. Other lines of environmental evidence indicate the property was open land with no indicators of HTRW. No RECs were identified from this dataset.

There is no one owner of Triple Creek Park; therefore, the Director of Parks and Recreation for the City of Gallatin, Mr. David Brown, was interviewed on 30 November 2017. Mr. Brown explained that he is unaware of any current or historic environmental condition that would impact the proposed project. Mr. Brown confirmed the land was historically used for farming, and, to his knowledge, no industrial or commercial practices have ever existed on the property.

No RECs were identified during this ESA that are believed to have impacted the proposed project area and no further ESAs are recommended for the proposed structural measure. No further deeds have been reviewed for the proposed project. A complete deed search for environmental liens and covenants will be conducted when the feasibility study is accepted and the alternative is ready for implementation.

A copy of the Phase Ia ESA may be reviewed in Appendix C of this report.

2.11 SOCIOECONOMIC AND ENVIRONMENTAL JUSTICES

2.11.1 EO 12898 Environmental Justice

On 11 February 1994, President Clinton issued Executive Order (EO) 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (56 Fed. Reg. 7629). This EO focuses Federal attention on the relationship between the environment and human health conditions of minority communities and calls on agencies to make achieving environmental justice part of their mission. The order requires the EPA and all Federal and state agencies receiving Federal funds to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and low-income populations. It also requires the agencies to develop strategies to address this problem.

2.11.1.1 Minority Population

As defined in EO 12898 and Council of Environmental Quality (CEQ) guidance, a minority population occurs where one or both of the following conditions are met within a given geographic area:

- The American Indian, Alaskan Native, Asian, Pacific Islander, Black, or Hispanic population of the affected area exceeds 50 percent.
- The minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

A minority population also exists if more than one minority group is present and the aggregate minority percentage meets one of the above conditions. The selection of the appropriate unit of geographic analysis could be a governing body’s jurisdiction, a neighborhood, census tract, or other similar unit. Note that the Hispanic population is a multi-racial group which may overlap with other minority groups. A summary of the population demographics is shown in Table 2. Based on the demographics in the study area and EO 12898 guidance, a minority population does not exist in the study area.

Table 2. Summary of Population Demographics.

Population	Sumner County 2015 Estimate	Sumner County Percent	Tennessee Population
White	145,753	85.9%	74.6%
Black or African American	11,666	6.8%	17.1%
American Indian or Alaska Native	527	0.3%	0.4%
Asian	2,138	1.2%	1.7%
Pacific Islander	116	0.1%	0.1%
Hispanic or Latino	7,137	4.2%	5.0%
Total	169,623		

Data source: US Bureau of Labor Statistics, based on 2014 estimates. Group populations may not add exactly to the 2014 estimate due to rounding and other groups not included.

2.11.1.2 Low-Income Population

Executive Order 12898 does not provide criteria to determine if an affected area consists of a low-income population. For the purpose of this assessment, the CEQ criteria for defining a minority population has been adapted to identify whether or not the population in an affected area constitutes a low-income population. An affected geographic area is considered a low-income population (i.e., below the poverty level, for purposes of this analysis) where one or both of the following conditions are met within a given geographic area:

- The percentage of low-income persons is at least 50 percent of the total population.
- The percentage of low-income persons is meaningfully greater than the low-income population percentage in the general population or other appropriate unit of geographic analysis.

The EPA defines the poverty level as earning less than \$15,000 in household income for these datasets. This analysis defines low-income as households earning less than \$25,000 per year. The income distribution is summarized in Table 3. Based on the 2016 U.S. Census Bureau American Community Survey (ACS) data, about 22.4 percent of households in Gallatin can be considered to be in poverty status, compared to about 17.6 percent in Sumner County and 26.7 percent in the State of Tennessee. The study area does not meet either criterion as the percentages of low-income persons are substantially less than 50 percent and are not meaningfully greater than in the State of Tennessee as a whole.

In summary, the study area was not determined to have environmental justice issues based on minority or low-income populations.

Table 3. Income Distribution Summary

Population	Gallatin	Sumner County	Tennessee
Total Households	12,296	63,240	2,522,204
< \$14,999	11.2%	8.2%	14.4%
\$15,000 - \$24,999	11.2%	9.4%	12.3%
\$25,000 - \$49,999	28.6%	24.5%	26.3%
\$50,000 - \$74,999	18.2%	20.1%	18.3%
\$75,000 +	30.8%	37.8%	28.7%

2.11.2 EO 13045 Protection of Children

On April 23, 1997, President Clinton issued Executive Order (EO) 13045, Protection of Children from Environmental Health Risks and Safety Risks (62 Fed. Reg. 19,885). This EO focuses Federal attention on the relationship between the environment and human health conditions that may disproportionately affect children and ensures all policies, programs, activities, and standards address risks to this vulnerable segment of the population. The age distribution is summarized in Table 4.

Table 4. Age Distribution Summary

Population	Population Estimate	Percent of Gallatin Population	Percent of Tennessee Population
Persons under 5 years	2,262	7.5%	6.4%
Persons under 18 years	7,330	24.2%	23.6%
Persons between 18 and 64 years	18,834	62.2%	63%
Persons 65 years and over	4,114	13.6%	13.4%

United States Census Bureau, 2010 Census

3.0 PLAN FORMULATION

3.1 PROBLEMS AND OPPORTUNITIES

3.1.1 Planning Problems

- Recurrent flooding and damages along the East Camp Creek and its tributaries
- Many structures, infrastructure and facilities become flooded in Gallatin, Tennessee
- Highway 31E becomes flooded, which is a major thoroughfare and route for emergency vehicles

3.1.2 Planning Opportunities

- Potential to reduce damages to developed property and non-physical losses, using structural and non-structural measures
- Sites exist for potential flood detention and channel modification to reduce peak flow in damage centers

3.2 OBJECTIVES AND CONSTRAINTS

3.2.1 Planning Objectives

A key Federal objective of water resources and related land resource planning is to contribute to the national economic development (NED). The study and its recommendation must be consistent with protecting the nation's environment, pursuant to Federal environmental statutes, and with all Federal planning requirements. Contributions to NED are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the direct net benefits that accrue in the planning area and in the rest of the nation.

- Reduce flood damages to structures along Town Creek in Gallatin, TN by the year 2025, once the project is fully constructed and operational
- Reduce flood risk to critical infrastructure by the year 2025, once the project is fully constructed and operational

3.2.2 Planning Constraints

In any study, constraints generally exist which impede or jeopardize the achievement of the stated planning objectives. Constraints could include:

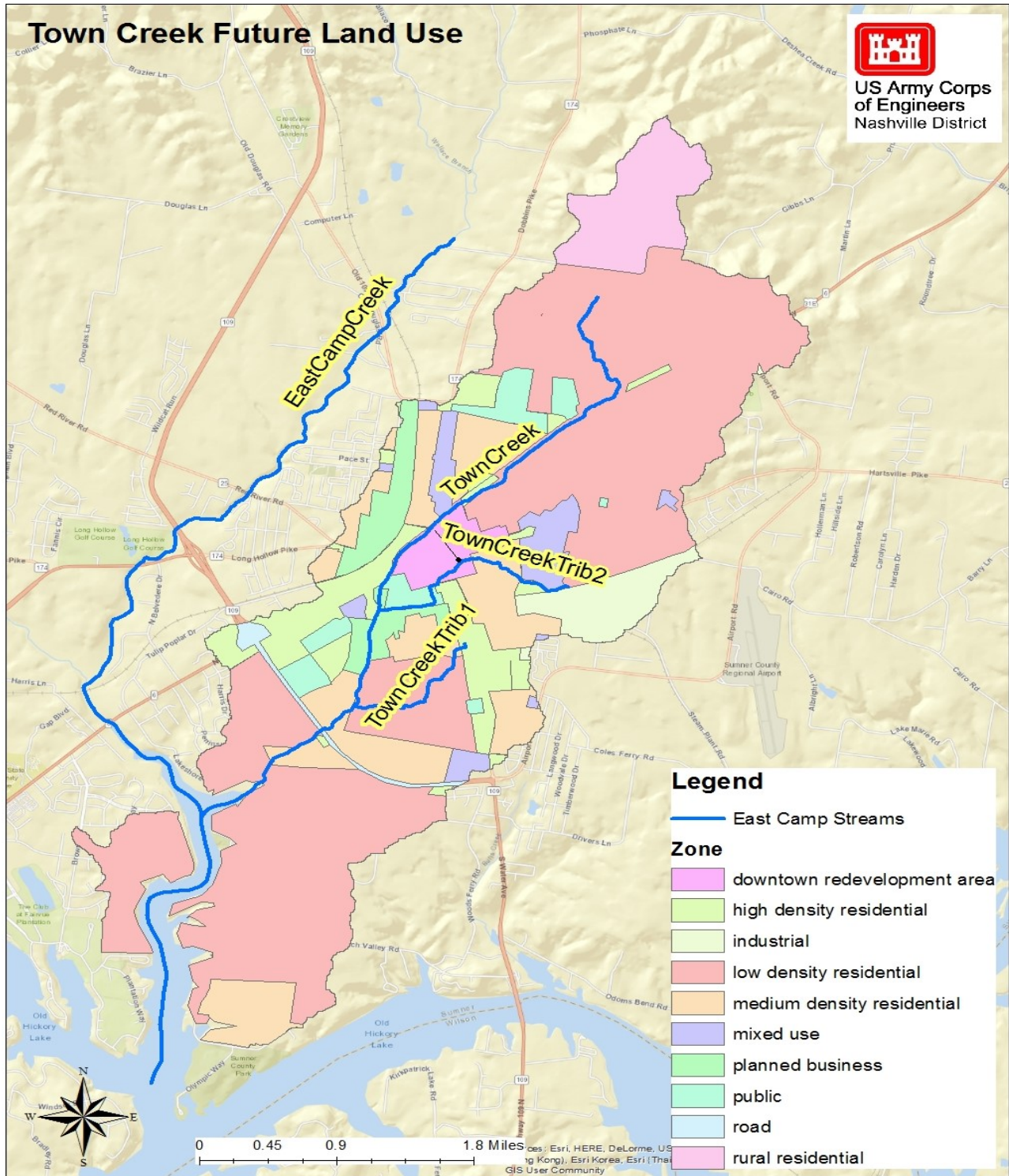
- Maintain or improve the environment, including aquatic habitat
- Avoid inducing flood damages caused by measures
- HTRW – avoid, minimize, or remediate, if required

3.3 MOST PROBABLE FUTURE WITHOUT PROJECT CONDITIONS

The future conditions of the watershed were considered as part of the plan formulation hydrologic modeling. They were used to evaluate the effect of expected land use development on peak flow values, and consequently economic feasibility of considered flood risk management (FRM) measures.

Hydrologic modeling parameters were adjusted to account for future development considerations in the Town Creek watershed. The justification for the parameter adjustments comes from a growth forecast map titled “City of Gallatin, General Land Use Plan, Future Land Use Map,” which is a map published by the City of Gallatin Planning Department and GIS section. The map was digitized in GIS and used to estimate future impervious percentages of individual sub-basins. Due to this basin being an ungaged basin with limited data, the upper band of the NOAA Atlas 14 was adopted as the future depths of the watershed. In the likely event of a future revision to the region's NOAA Atlas 14 depths, the published Town Creek depths will likely rise due to the numerous large events since the publication of the current NOAA Atlas 14 depths. Atlas 14 is a precipitation frequency estimate with 90% confidence intervals that is developed by NOAA's Hydrometeorological Design Studies Center. The data for Tennessee is published in Volume 2, Version 3.0 of the NOAA Atlas 14 revised in 2006. All of the NOAA Atlas 14 data has been digitized and published through the NOAA Precipitation Frequency Data Server (PFDS) online.

Figure 12: Projected Land Use in the Town Creek Watershed



3.4 MEASURES TO ACHIEVE PLANNING OBJECTIVES

3.4.1 Preliminary Structural and Non-Structural Measures

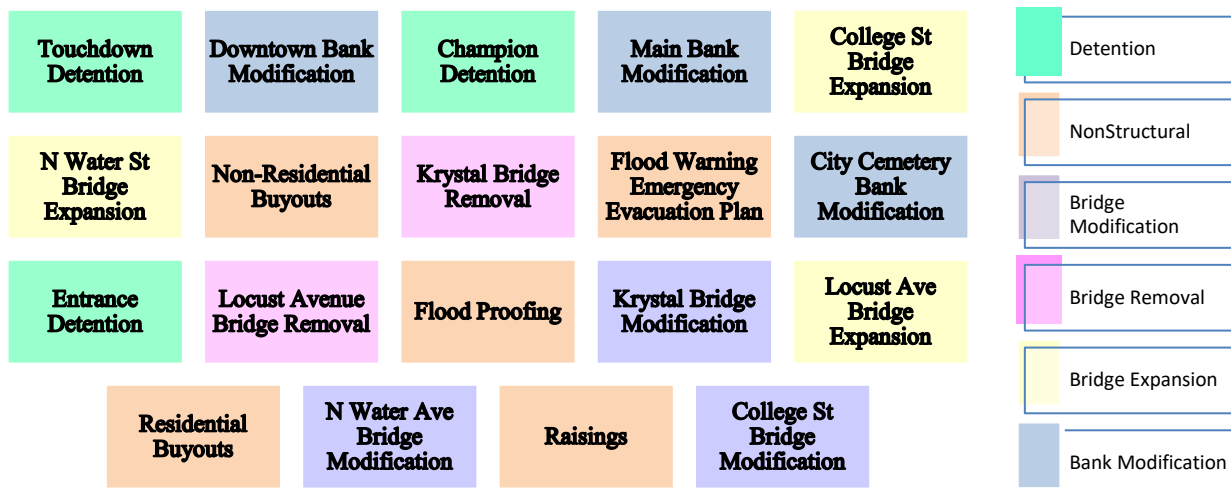
While modeling was developed for East Camp Creek, Town Creek, Town Creek Tributary 1, and Town Creek Tributary 2, measures were only evaluated on Town Creek. This was a request of the City of Gallatin, as the main damage center in the city is along Town Creek.

Preliminarily, nineteen measures were identified, fourteen structural and five non-structural, as shown in Table 5. The entire PDT was taken on a site visit to look at all identified measures and identify potential flood reduction options, construction methods and rough costs.

Measures were analyzed on an individual basis, first by looking at the potential for flood reduction. If the measure showed positive flood reduction benefits then environmental, HTRW and cultural factors were taken into account, as well as constructability. The need and availability of real estate was also taken into consideration. If a measure moved forward after looking at all of the previously listed factors, then economic benefits were calculated. Those economic benefits were utilized to calculate a cost that the benefits would support with a 1.0 benefit-cost ratio (BCR). The PDT made a site visit and collected information on the measures that were remaining with the cost to support a 1.0 BCR in mind. If the PDT determined that the cost to support a 1.0 BCR was far outside of a reasonable range of cost to construct the measure, then the measure was eliminated from further consideration. Detailed cost estimates were developed for measures that were considered to have a construction cost within the range of the 1.0 BCR cost. If the developed cost estimate exceeded the 1.0 BCR cost, then the measure fell out of consideration. All measures that provided flood reduction benefits, were considered feasible from an environmental, HTRW, cultural, real estate and constructability standpoint, and had a developed cost BCR greater than 1.0 moved forward in the analysis to be combined into alternatives.

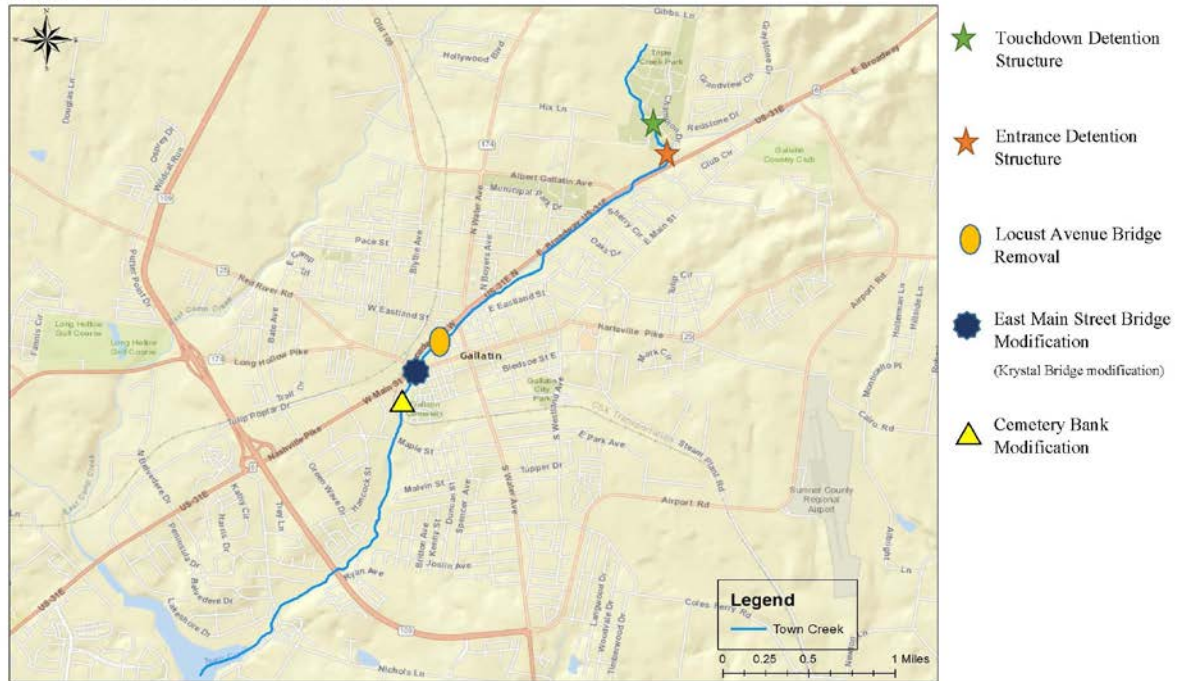
Cursory analysis eliminated all but five of the structural measures, because they did not show any significant reduction in flood profiles or would have been significantly more expensive than the benefits provided by the flood reduction they provided.

Table 5. Initial Measures Identified



3.4.1.1 Structural Measures

Gallatin, TN Section 205 – Town Creek Measures



3.4.1.1.1 Entrance Detention Structure

Detention structures are storm water best management practices that provide general flood protection and can also help control extreme flood events. The proposed structure would be constructed as a “dry” detention structure and would not be designed to hold a permanent pool of water. The structure would function by detaining large inflows of water and limiting the outflow with a reduced opening at the lowest point of the structure. The detention area would be constructed near the entrance of Triple Creek Park.

3.4.1.1.2 Touchdown Detention Structure

This measure would be located within Triple Creek Park and constructed to perform as a dry detention structure. The detention basin would be constructed by raising a portion of Touchdown Drive and downsizing two existing culverts that pass underneath the road to control outflow.

3.4.1.1.3 Cemetery Bank Modification

This measure involves bank excavation to increase capacity and encourage flow along the targeted area of Town Creek. After excavation, the widened bank slopes would be properly armored to ensure stability.

3.4.1.1.4 Krystal Bridge Modification

The eastern portion of the Krystal parking lot spans the Town Creek channel. Flow is currently restricted by the limited size of the inlet on the north side of the restaurant parking lot. This measure would increase inlet and outlet flow by demolishing existing bridging structures and by widening and increasing the inlet size.

3.4.1.1.5 Locust Avenue Bridge Removal

The Locust Avenue Bridge has been identified as a constriction to flow along Town Creek in Gallatin. This measure would remove the bridge and widen and armor the stream bank in the upstream direction from the existing bridge to increase flow and capacity in the area.

3.4.1.2 Non-Structural Measures

Per ER 1105-2-100, Planning Guidance Notebook, analysis of non-structural (NS) measures was conducted independently of structural measures. A plethora of NS measures exist from wet/dry flood proofing to the raising of structures in place to total evacuation. The study area did not present the potential for any measures for non-residential structures, which means the NS analysis was completely aimed at residential structures. All of the aforementioned NS measures were either deemed functionally not feasible or cost inefficient. To analyze the benefits of non-structural measures, the project manager, economist, and GIS specialist used HEC-FDA 1.4.1 output. Each structure's damage for the 2, 5, 10, 25 and 50-year event were analyzed to identify structures that received frequent flooding. This narrowed the analysis to four residential structures for further analysis.

The NS analysis was developed entirely within the HEC-FDA certified model. To account for NS benefits, it was necessary to make additional HEC-FDA runs with the (structure inventory database) SID adjusted to account for potential buyouts and raises. Residential structures that were identified as potential buyouts were removed from the NS HEC-FDA model. First floor elevation was adjusted to 1-foot above the 100-year event. This adjusted first floor elevation was ascertained within the HEC-FDA detailed output from the original HEC-FDA analysis. The HEC-FDA model was then re-ran with the updated NS SID and results were compared to the with-project conditions where applicable and to the without project conditions for those streams where a structural measure did not apply. Damages from the NS model run were then subtracted from the original without project model run to produce NS benefits for the study. F

The aforementioned HEC-FDA exercise identified four potential residential structures that needed further analysis due to the frequency of flooding. Using the method for calculating non-structural benefits, the removal of these structures from the database created only \$6,900 in equivalent annual benefits (EAB). It was determined that the non-structural measures produced insufficient benefits to justify evacuation or raising in place.

The non-structural analysis is discussed in more detail in the Economic Appendix F.

3.4.2 Excluded Measures

Detailed costs analysis was not conducted on the below three excluded measures. The cost that the flood reduction benefits would support was backed into using our economic analysis, and it was determined by our design and cost team that these measures were not in the range of the cost that the benefits could support.

3.4.2.1 Cemetery Bank Modification

This measure fell out of consideration as the benefits would not support a cost that would be in range of this measure.

3.4.2.2 Krystal Bridge Modification

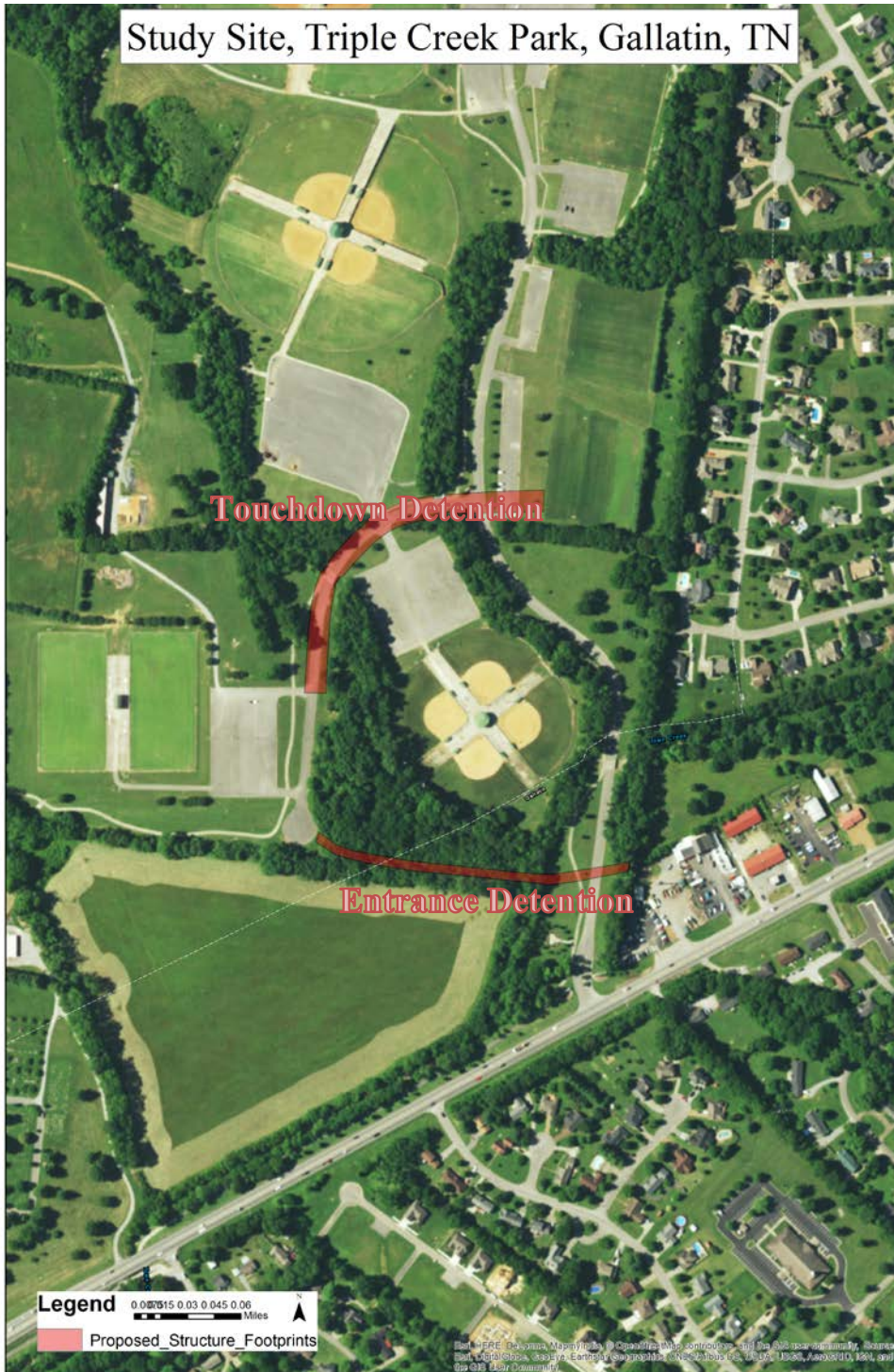
After additional site visits and analysis, it was found that there was going to be a significantly greater cost because of additional features that were needed during construction. This would drive the cost above what the benefits could support.

3.4.2.3 Locust Avenue Bridge Removal

This measure produced such isolated benefits that it would not support the cost of the removal. The flood reduction benefits were limited to a few hundred feet upstream of Locust Avenue Bridge.

3.5 FORMULATION AND COMPARISON OF ALTERNATIVE SOLUTION SETS*

The remaining two measures (Entrance Detention and Touchdown Detention) were further analyzed on an individual basis and combined into a third alternative. More detailed cost estimates were calculated based on preliminary designs.



3.5.1 Alternative Plan Descriptions

3.5.1.1 No Action Alternative*

For the No Action Alternative, no new FRM measures would be implemented. Consideration of the “no action” alternative, where no federal action is taken, is required under the National Environmental Policy Act (NEPA). The impacts of the “no action” alternative are used as a baseline to compare the impacts of alternatives considered, including the tentatively selected plan (TSP).

3.5.1.2 Entrance Detention

The Entrance Detention would be located at the entrance of Triple Creek Park in Gallatin, TN. The detention would be built and contained completely within publicly owned property. The Entrance Detention would be able to store storm water from three streams: Town Creek and two unnamed tributaries of Town Creek. The culverts would pass normal flow and small frequent storm events.

3.5.1.3 Touchdown Detention

The Touchdown Detention would be located on Touchdown Drive at Triple Creek Park. This measure would raise the existing road and replace the existing culverts with smaller culverts to constrict the flow from Town Creek and an unnamed tributary to Town Creek.

3.5.1.4 Multiple Detention

The Multiple Detention alternative would combine the Entrance Detention and the Touchdown Detention measures.

3.5.2 Comparison of Alternative Plans

The FRM benefits considered for this evaluation include reductions in potential flood damages to residential, commercial and public structures. These damage reductions are compared to the costs of project implementation. A project is considered economically justified if the total value of the average annual benefits exceeds the average annual costs.

To determine the TSP, the future without-project condition and all alternative plans were modeled in HEC-FDA 1.4.1 and evaluated over a 50-year period using the current Federal discount rate (2.75%). The plan that reasonably maximizes net annual benefits (average annual benefits minus average annual costs) in this initial analysis was then optimized to determine the configuration of that plan that further maximizes net benefits. This plan was identified as the NED plan and tentatively selected as the recommended plan.

Each measure within a plan has to support itself with a BCR above 1.0. Therefore, each measure was evaluated individually, as well as in a third combined alternative plan. After the final array was developed, as described in Section 3.5.1, additional surveys and more in-depth analyses were performed on the remaining measures. This detailed analysis led to the selection of the recommended plan.

The plans were evaluated against their ability to meet the study objectives and avoid the constraints. The plans were given a rating of “High,” “Medium,” or “Low,” as outlined below:

High: The plan would successfully meet the objective or avoid the constraint.

Medium: The plan would partially meet the objective or avoid the constraint.

Low: The plan would not meet the objective or avoid the constraint.

The No Action Alternative, Entrance Detention, Touchdown Detention and Multiple Detention meet the objectives and constraints as shown in Table 6.

Table 6. Plan Comparison

Alternative Plan	Objectives		Constraints			
	Reduce flood damages	Reduce flood risk to critical infrastructure	Maintain or improve the environment	Minimize relocation or acquisition of homes and businesses	Avoid inducing flood damages	HTRW - avoid or minimize where possible
No Action	<i>Low</i>	<i>Low</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>High</i>
Entrance	<i>High</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>High</i>
Touchdown	<i>High</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>Medium</i>	<i>High</i>
Multiple	<i>High</i>	<i>High</i>	<i>High</i>	<i>High</i>	<i>Medium</i>	<i>High</i>

3.5.2.1 Estimated Flood Risk Management Benefits

In the No Action Alternative there would be no changes to the existing conditions, and the threat of flooding would remain the same. The estimated equivalent annual damages for the without-project condition is \$442,420.

The estimated annual benefits for the three action alternatives are summarized in Table 7. Additional detail on the economic analysis can be found in Appendix F.

Table 7. Estimated Flood Risk Management Benefits

	Entrance	Touchdown	Multiple
Without Project Average Annual Damages	\$442,420	\$442,420	\$442,420
With Project Average Annual Damages	\$286,440	\$286,360	\$228,720
Equivalent Annual Benefits	\$155,980	\$155,060	\$213,700

3.5.2.2 Preliminary Estimate of Alternative Plan Costs

For the preliminary estimate of costs associated with the action alternatives, several factors were taken into account, as shown below in Table 8:

Table 8. Preliminary Estimated Average Annual Costs

	Estimated Cost (\$1,000)		
	Entrance	Touchdown	Multiple
Construction	\$1,357	\$3,636	\$4,690
Engineering and Design (20%)	\$287	\$662	\$855
Construction Management (10%)	\$138	\$315	\$406
LERRDs	\$139	\$400	\$522
Total First Costs	\$1,921	\$5,014	\$6,473
Interest During Construction	\$18.3	\$42.6	\$73.0
Annualized First Costs	\$71.8	\$187.3	\$242.5
Annual OMRR&R	\$5.0	\$8.5	\$13.0
Average Annual Cost	\$76.8	\$195.8	\$255.5

3.5.2.3 Preliminary Cost-Benefit Analysis

Table 9 displays a summary of the economic analysis for Entrance Detention, Touchdown Detention and Multiple Detention.

Table 9. Preliminary Cost-Benefit Analysis

	Entrance	Touchdown	Multiple
Equivalent Annual Benefits (\$1,000)	\$155.9	\$156.0	\$213.7
Average Annual Costs (\$1,000)	\$76.8	\$195.8	\$255.5
Net Annual Benefits (\$1,000)	\$79.1	-\$39.8	-\$41.8
Benefit-to-Cost	2.0	0.8	0.8

3.6 RECOMMENDED PLAN*

Based on the analyses conducted and assessment of environmental impacts, Entrance Detention is the TSP. This option includes constructing a detention structure near the entrance of Triple Creek Park. The plan, estimated cost, schedule and implementation requirements are summarized in the following section.

3.6.1 Recommended Plan Description

The Entrance Structure at Triple Creek Park would be constructed to function as a “dry” detention structure. The top of the soil detention structure is to be constructed to elevation 562.0 feet mean sea level (MSL) along the entire length. The structure would tie into existing ground at elevation 562.0 feet on the east and west extremities of the planned construction. The proposed structure is approximately 800’ in length and vary in height from 0–10 feet measured vertically from base to crest. The width of the structure would be 10 feet at the top of the structure. The design width at the base varies between 10–50 feet depending on the height of the structure at any given point along the length. An additional 15-foot vegetation clear zone would be established and maintained along each side of the detention structure. All data used for this feasibility study is referenced to the Tennessee State Plane Coordinate System and North American Vertical Datum (NAVD 88).

The entire structure would be armored with stone protection to prevent erosion and ensure structural integrity during overtopping events. The current design includes an 18-inch minimum thickness of Class II armor stone. The upstream and downstream sides of the structure are designed to be constructed at 2H:1V slope to ensure structural slope stability and accommodate the placement and retention of sufficient armor stone. The structure is designed with a culvert placed in the channel of the existing stream. The design opening consists of two 8-foot-by-8-foot precast concrete culverts situated side-by-side over the existing stream channel to provide outlet control of the detained storm water. A 400-foot portion of the Triple Creek Park entrance road (Champion Drive) would need to be raised to crest the necessary design height of the detention structure. The existing height of Champion Drive would be raised on a gradual slope to elevation 562.0 feet where the detention structure would intersect the road near the entrance to the park. The road would have to be raised approximately 4-feet at the point of intersection with the structure, as referenced in Figure 17, Figure 18 and Figure 19.

Construction would necessitate clearing and grubbing of existing trees and shrubbery, topsoil stripping and removal of any unacceptable in-situ soils, placement and compaction of acceptable structural fill material, excavation for and placement of pre-cast concrete culvert structure, demolishing and raising a 400-foot section of park entrance roadway, utility tie-in and remediation, raising the electrical outlet boxes and HVAC condenser units for the ball field facility, and associated site renewal to include grassing, planting and sidewalk relocation. Construction of temporary haul roads and lay-down areas may be necessary. The public should expect temporary closure of the Champion Drive park entrance.

The City of Gallatin has identified disposal sites for use during construction. Approximately 785 cubic yards (CY) of material (600 CY unsuitable soil/organic material and 185 CY of asphalt millings/rubble) will be disposed of on Triple Creek Park property (Figure 16) at a designated disposal location just northwest of the Triple Creek Dog Park. The remaining disposal material (approximately 50 CY concrete rubble) will be disposed of at a designated site off of Nichols Lane, located approximately two miles south of the Gallatin Square (Figure 15).

This measure focuses on flood reduction downstream of the detention. The benefits of this measure are primarily focused on the more frequent events, such as the 20% and 10% annual exceedance probability (AEP) events. For the 10% AEP, approximately 0.5 foot of flood reduction is seen at the downtown area of Gallatin, TN along U.S. Route 31 East. For the larger less frequent events, less benefits are realized.

Figure 15. Nicholas Lane Disposal Area

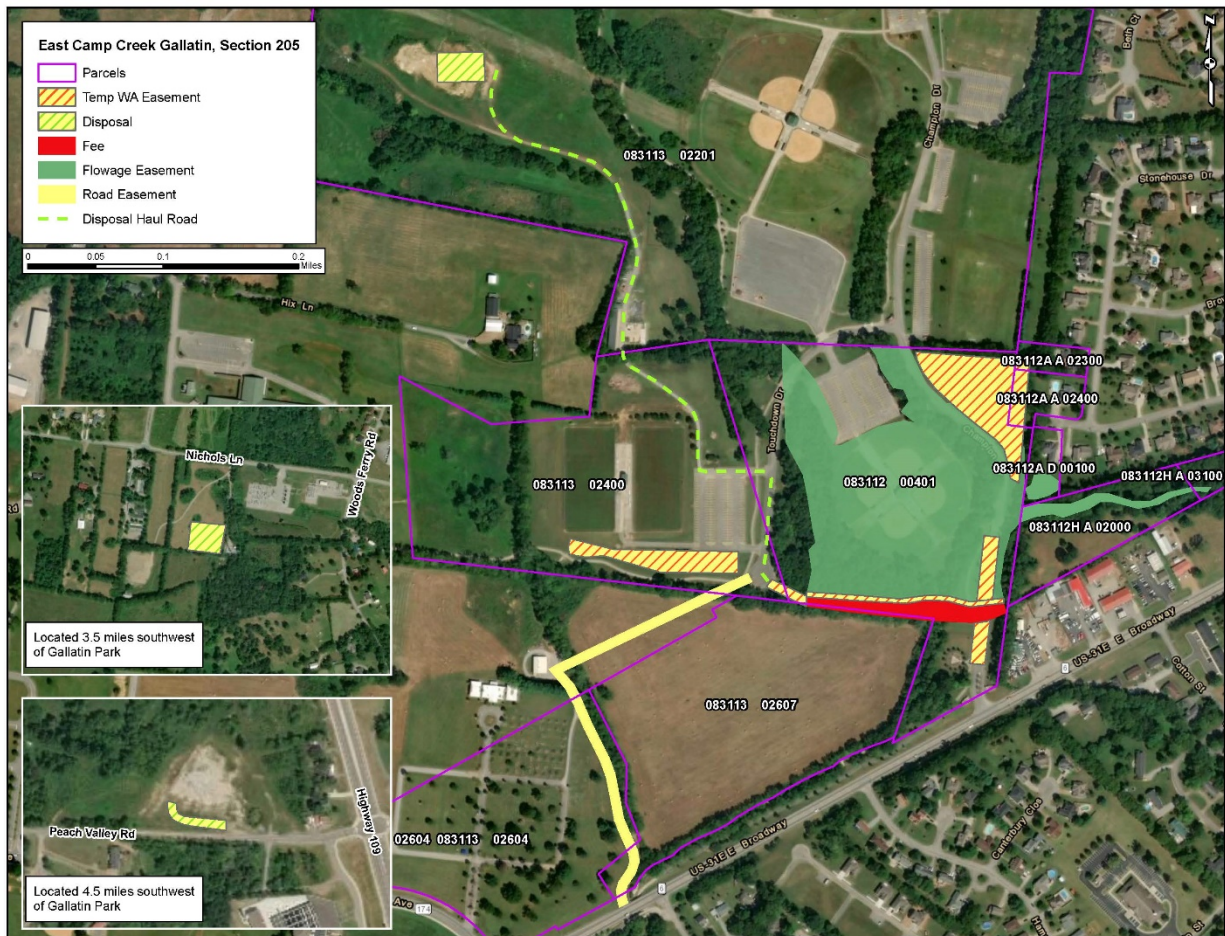


Figure 16. On-Site Real Estate for TSP.



Figure 17. Schematic of Entrance Detention Structure



Figure 18. Plan View of Entrance Detention Structure

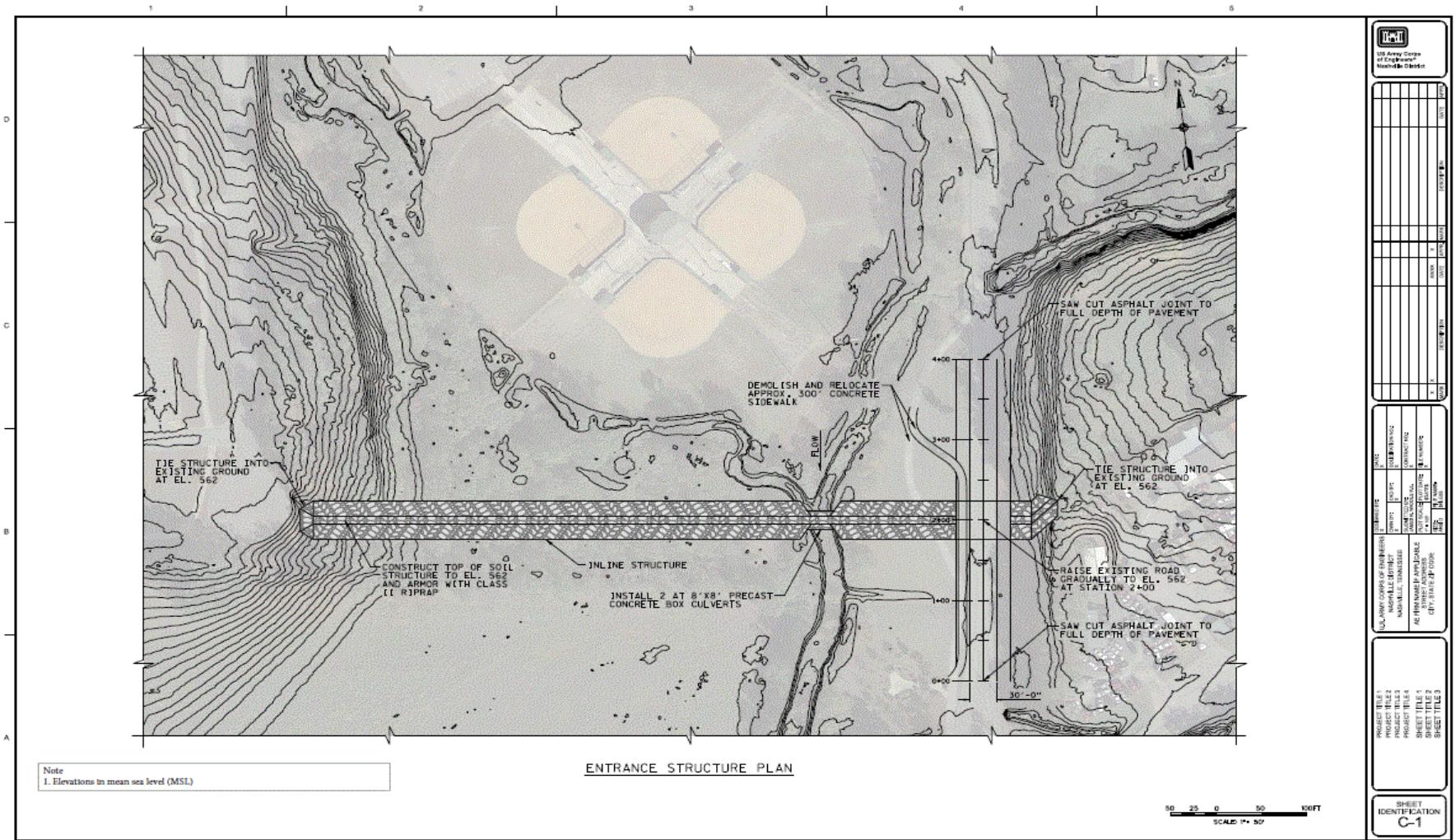
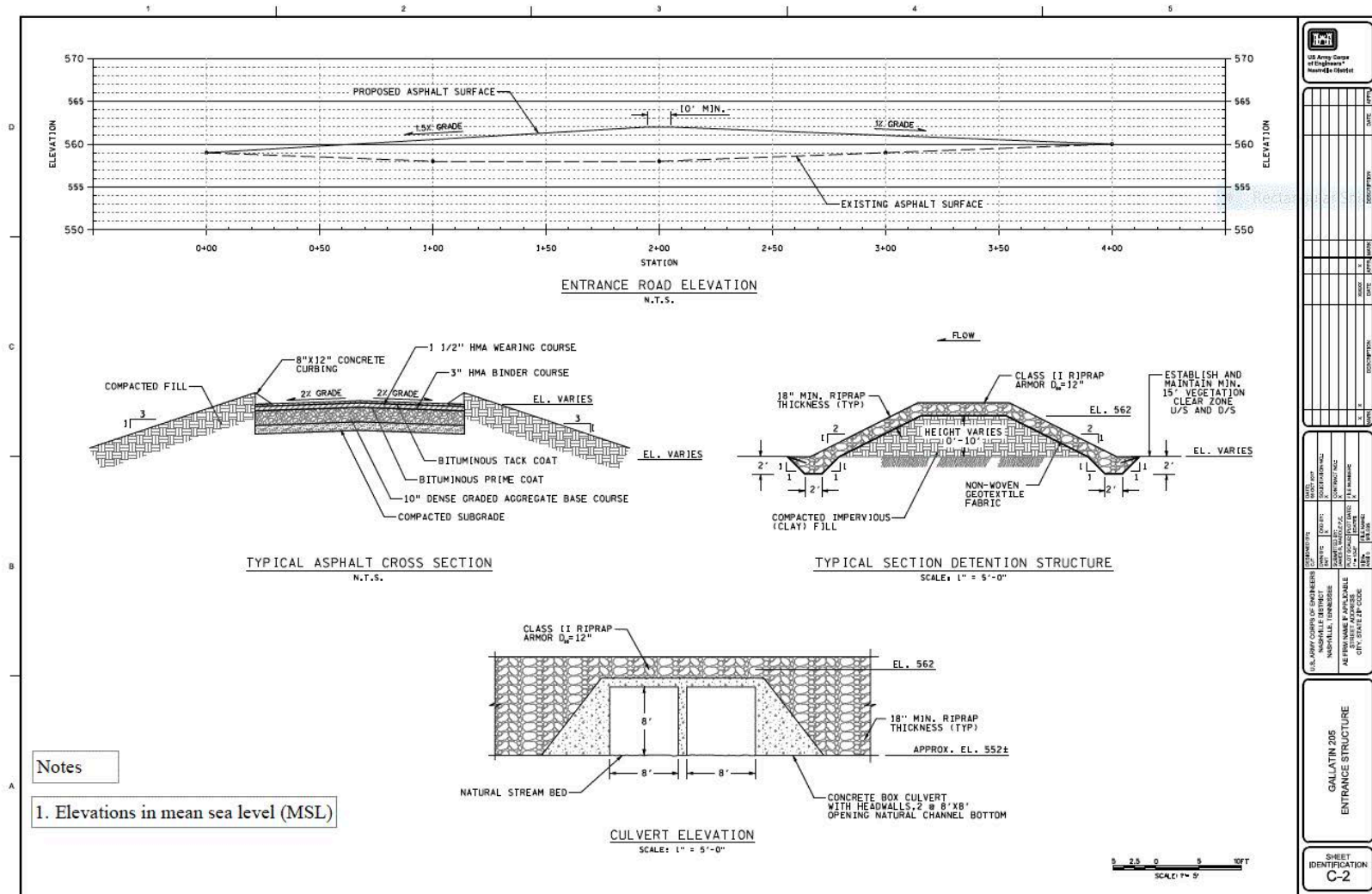


Figure 19. Typical Sections for Entrance Detention Structure.



3.6.2 Risk and Uncertainty

Key uncertainties associated with the evaluation of alternative plans and associated risks are summarized in Table 11 and detailed in Appendix I. The risks are qualitatively described in the table using the probability of negative consequences occurring and the expected magnitude of those consequences. The probability and consequence ratings define the level of risk as outlined in Table 10.

Table 10. Probability and Consequence Ratings

Risk Rating Computation Guide			
Likelihood Estimate	Consequence Estimate		
	High	Medium	Low
High	Very High	High	Medium
Medium	High	Medium	Low
Low	Medium	Low	Very Low

Consequence Rating Terms

High—the consequences of this undesirable result are unacceptable.

Medium—the consequence of this risk can be tolerated.

Low—the consequence of this risk are insignificant.

Likelihood Rating Terms

High—the probability the undesirable result would occur is estimated to be greater than 70%.

Medium—the probability of the undesirable result occurring is approximately 50/50.

Low—the probability of undesirable result occurring is estimated to be less than 30%.

Certainty Rating Terms

High—there is significant relevant supporting factual data and/or evidence available to support the estimate.

Medium—there is some good evidence and some significant data gaps.

Low—there is little to no relevant factual data or evidence available to support the estimate.

Table 11. Summary of Key Assumptions and Associated Risks

Risk Area	Consequence	Likelihood	Risk Level
Site conditions could differ from what was determined during the feasibility phase leading to an increase in construction cost.	<i>Medium</i>	<i>Medium</i>	<i>Medium</i>
Cost increase and schedule impact due to unforeseen foundations issues.	<i>Medium</i>	<i>Medium</i>	<i>Medium</i>
Cost change resulting from change to the chosen culvert design.	<i>Low</i>	<i>Medium</i>	<i>Low</i>

3.6.2.1 Residual Risks

The TSP is expected to reduce the consequences by \$158,900 and the frequency of the 20% and 10% annual exceedance probability flooding by 0.5 foot at the commercial center in Gallatin, TN along Town Creek. However, there is expected to be residual flooding for the all of the annual chance exceedance flood events as this measure will not eliminate flooding on Town Creek.

3.6.2.2 Risk to Life Safety

There will always exist some level of life safety threat along flashy streams like Town Creek, as seen during the May 2010 flood in Middle Tennessee. A low-medium flood severity level currently exists for the project area based on FEMA guidance with or without the construction of the Entrance Detention measure. USACE analysis considered the full range of expected events, including unexpected failure of the measure (see Appendix A – H&H for analysis). Construction of the Entrance Detention measure will reduce economic damages and flooding over the full range of expected events. Warning and evacuation times also will be increased for more frequent (5-year, 20% annual chance exceedance (ACE) to 10-year, 10% ACE) flood events. Hydrologic and hydraulic analysis of unexpected failure of the TSP features resulted in insignificant changes to flood severity or life-safety threat along Town Creek.

3.6.2.3 Environmental Risk Factors

Only minor uncertainty risks exist under environmental factors. Currently there is no proposed mitigation for the project; however, during the state water quality certification/permitting process, mitigation may be required as a part of the permit conditions. Potential features may include the purchase of stream mitigation bank credits, vegetation/tree plantings along the stream corridor, or methods of constructing (best management practices). During the proposed design of the project, a federally listed bat habitat survey will be conducted and any potential habitat would be coordinated with the USFWS. During potential coordination, the USFWS may require mitigation in the form of mitigation payments. Any bat habitat mitigation would be minor. Based on current knowledge of the environmental resources and potential impacts of the project, no further uncertainty is known.

3.6.2.4 Engineering Risk Factors

Table 11 contains a summary of the perceived uncertainty and risk involved with the recommended plan. As with most construction work, the chance of encountering differing site conditions exists on this project. Subsurface investigations and material testing will be performed during the design phase of this project, and USACE will work with the City of Gallatin and the local utility companies to locate and describe all known utilities. All of this information will be incorporated into the project design package. These efforts aim to mitigate the risk of encountering differing site conditions; however, it is not always possible to eliminate all of the unforeseen risk involved with excavation work. Similarly, during the project design phase there also exists the chance that a design change will be necessary to ensure the best product moves forward for construction. Variances such as slight elevation changes to the height of the detention structure or minimal changes to the culvert design may prove valuable to the overall project performance during the design phase. If unforeseen or unsuitable materials are discovered during construction, or it is deemed necessary to make a change during the design phase, it would change the currently proposed design, which could affect the estimated cost and construction duration of the overall project.

The risk for scope growth is present as well. During construction, the contractor will be required to dig a 6-foot deep inspection trench under and along the entire length of the proposed detention structure. The inspection trench will enable the contractor to identify and mitigate any unforeseen problem areas that are discovered in the foundation of the detention structure. If features are discovered under and along the foundation of the structure, a growth in the scope of the project may occur. The design and construction effort to remediate undiscovered features, such as karst or sinks, would almost certainly necessitate a modification/change to the award contract that could increase the cost and duration of the project.

3.6.2.5 Economic Risk Factors

The analysis in this report follows guidance described in ER 1105-2-101, Risk Assessment for Flood Risk Management Studies (17 July 2017). As stated in this ER: “A variety of variables and their associated uncertainties may be incorporated into the risk assessment of a flood risk management study. For example, economic variables in an urban situation may include, but are not necessarily limited to depth-damage curves, structure values, content values, structure first-floor elevation, structure types, flood warning times, and flood evacuation effectiveness. Uncertainties in economic variables include building valuations,

inexact knowledge of structure type or of actual contents, method of determining first-floor elevations, or timing of initiation of flood warnings.” For additional information on economic risk factors see Section 4.3 of Appendix F.

3.6.2.6 Implementation Risk Factors

Subject to project availability of funding, full environmental compliance, and execution of a binding agreement with the non-Federal sponsor, construction is currently scheduled to begin in 2019. The schedule assumes the flood risk management measure will be in place by 2021. A continuous funding stream is needed to complete this project within the anticipated timeline, which requires continuing appropriations from Congress and the City of Gallatin to fund the detailed design phase and fully fund construction contracts. There was initial opposition to the project from the City of Gallatin Parks Director. Meetings were held with both the parks director and a presentation to the City Council and staff and comments were addressed.

Once the DPR is approved for this project, the City of Gallatin, as the non-Federal sponsor, and USACE will enter into a project partnership agreement (PPA). After the signing of the PPA, full design will begin. The non-Federal sponsor can acquire the necessary lands, easements, rights-of-way, relocations, and disposal areas to construct the project once the design is to a level to ascertain the needed acquisition. Since project features cannot be advertised for construction until the appropriate real estate interests have been acquired, obtaining the necessary real estate in a timely fashion is critical to achieving the project schedule. At the completion of construction, or functional portions thereof, the non-Federal sponsor would be fully responsible for the OMRR&R of the project or of the completed functional portion of the project.

3.6.3 Estimated Project Costs and Schedule.

A detailed description of the estimate of project cost for implementation can be found in Appendix E.

Table 12. Estimated Project Costs and Apportionment

	FY2018 & Prior	FY2019	FY2020	FY2021	FY2022	Cumulative	Percentage
Feasibility Study Costs*							
FED share*	\$ 710,000					\$ 710,000	54%
non-FED	\$ 610,000					\$ 610,000	46%
Design & Implementation Costs							
Design, Plans & Specs		\$ 73,800	\$ 172,200			\$ 246,000	
Mitigation			\$ -			\$ -	
LERRDs			\$ 318,000			\$ 318,000	
Construction Management				\$ 36,000	\$ 84,000	\$ 120,000	
Constructoin Contract				\$ 526,400	\$ 789,600	\$ 1,316,000	
Total Project Cost		\$ 73,800	\$ 490,200	\$ 562,400	\$ 873,600	\$ 2,000,000	
FED share		\$ 47,970	\$ 172,200	\$ 506,160	\$ 595,770	\$ 1,322,100	65%
non-FED		\$ 25,830	\$ 318,000	\$ 56,240	\$ 311,830	\$ 711,900	35%
non-FED cash/WIK**		\$ 25,830		\$ 56,240	\$ 311,830	\$ 393,900	
non-FED LERRD			\$ 318,000			\$ 318,000	

*Up to first \$100,000 is 100% federal responsibility. All costs after FCSA execution are shared 50/50.

**Minimum cash requirement in D&I phase is 5% of the Total Project Cost = \$100,000

Table 13. Implementation Schedule

Milestone	Scheduled	Actual
Initiate Feasibility Phase	3/27/2015	3/27/2015
Submit Federal Interest Determination Report	7/27/2015	7/27/2015
MSC Approved FID report	8/27/2015	8/27/2015
Execute Feasibility Cost Share Agreement	5/23/2016	5/23/2016
Submit MDM Draft DPR	8/7/2018	
MSC Approved MDM Draft DPR	10/10/2018	
Submit draft Final DPR	1/15/2019	
MSC Approved Decision Document	3/19/2019	
Project Approval - Initiate D&I phase	4/16/2019	
Fully Executed PPA	7/5/2019	
ATR Certified Construction Plans and Specifications	7/3/2020	
RE Certification	7/5/2021	
Construction Contract Award	10/5/2021	
Construction Complete	4/5/2022	
Project Closeout	9/5/2022	

3.6.4 Performance under Benchmark Flood

The recommended measure performs well throughout the Town Creek under the benchmark flood (1% annual chance exceedance flood) and the 10% annual chance exceedance. Figure 20, Figure 21 and Figure 22 below show some examples of cross-section taken at different reaches throughout Town Creek. Figure 20 shows cross-section 5128 located downstream of the State Route 109. The 1% annual chance exceedance future profiles show a difference of 0.35 feet between with- and without-project conditions. The 10% annual chance exceedance future profiles show a difference of 0.43 feet between with- and without-project conditions. Figure 21 shows cross-section 13105 located downstream of the Main Street culvert. The 1% annual chance future profiles show a difference of 0.16 feet between with- and without-project conditions. The 10% annual chance future profiles show a difference of 0.49 feet between with- and without-project conditions. Figure 22 shows cross-section 18585 located just downstream of the Gallatin Greenway pedestrian bridge. The 1% annual chance future profiles show a difference of 0.23 feet between with- and without-project conditions. The 10% annual chance future profiles show a difference of 0.6 feet between with- and without-project conditions.

Figure 20. Lower Town Creek Cross-Section with Future With and Without 100 Year Profiles

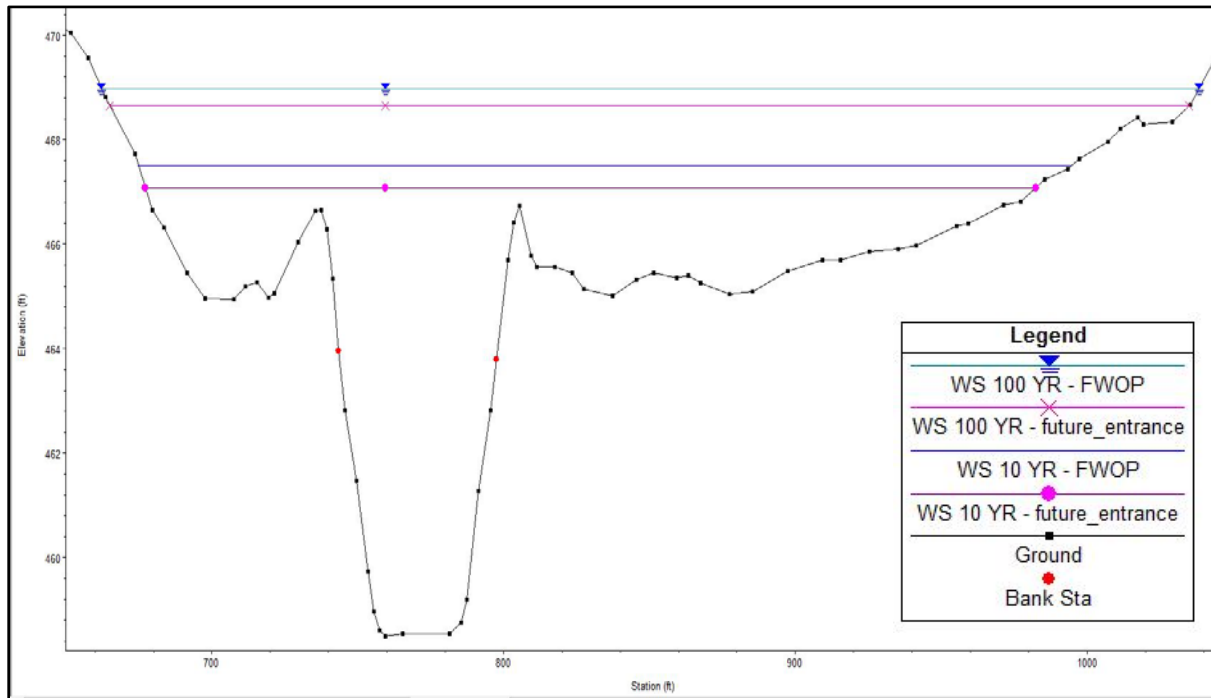


Figure 21: Mid-Town Creek Cross-Section with Future With and Without 100 Year Profiles

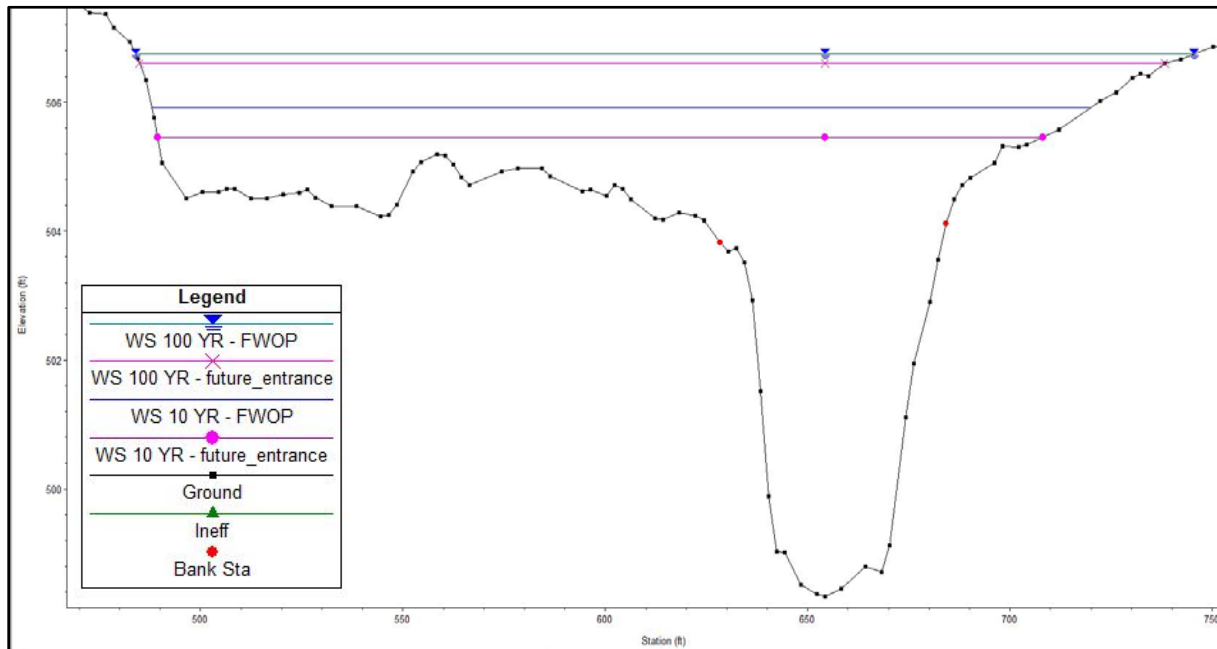
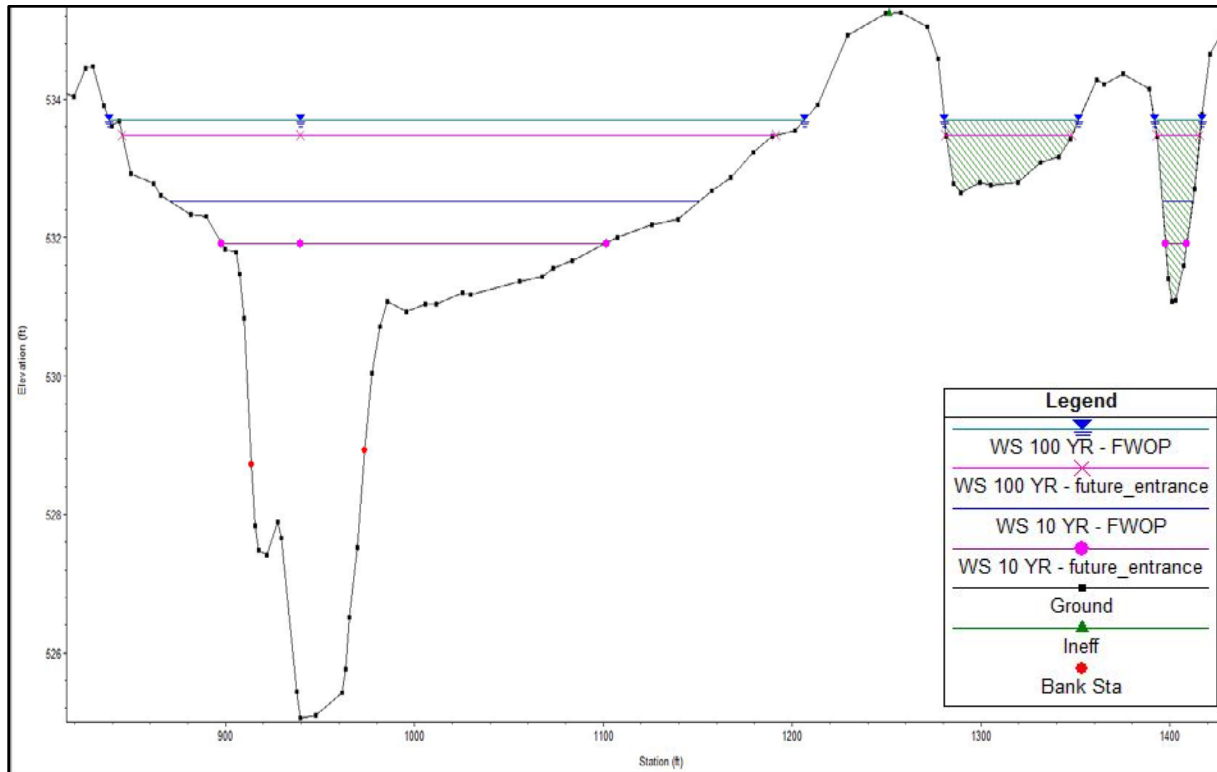


Figure 22: Upper Town Creek Cross-Section With Future With and Without 100 Year Profiles



3.6.5 Non-Federal Sponsor Responsibilities

A feasibility cost share agreement (FCSA) was entered into by the USACE Nashville District and the City of Gallatin on 23 May 2016. The City of Gallatin has been a significant contributor to the entire feasibility study. The City of Gallatin concurs with the recommended plan of Entrance Detention and has demonstrated partnership capability. The City of Gallatin has expressed intent to execute a project partnership agreement (PPA), after which they would provide clean lands, easements, rights-of-way, relocations, and disposal areas (LERRDs) and participate in the design and operations and maintenance (O&M) plan. The City of Gallatin would accept the completed project with the intent to monitor, operate and maintain the complete project as specified in the O&M manual and PPA.

4.0 ENVIRONMENTAL EFFECTS OF RECOMMENDED PLAN*

This section will identify potential environmental effects of the No Action Alternative and the TSP. Due to the reasons presented in Section 3.0 above, the Entrance Detention alternative was the only action alternative recommended for further analysis. The action alternative would include the use of haul roads, disposal, and borrow areas as described in Section 3.0 above. The haul road will be located on an existing access road. The disposal areas will be located in two different existing disposal areas. Borrow material will come from an existing commercial facility. Only minor temporary impacts from construction would be expected for any of these features, and the sites will be stabilized or maintained at the end of the project. No additional impacts would be expected for the below resources.

4.1 FLOODING

The TSP would reduce flooding and damages starting at the 20% annual exceedance probability (AEP) event, which corresponds to a 5-year flood event. The largest benefit happens at the 10% AEP event, which corresponds to a 10-year flood event. As the events get incrementally larger, reduced benefits are realized.

Under the No Action Alternative, no Federal action would be taken to address flooding. Flood damages would be expected to continue to occur as seen in historic floods.

4.2 CLIMATE

The TSP could be retrofitted in the future when it is past the current design life, if there are impacts due to climate change. If there are future more intense storm events, a larger volume of storm water would be added to the basin in a shorter period of time. This would make the TSP less efficient; therefore, the size of the TSP may need to be redesigned to add more storage capacity to reduce the same percentage of damage in the basin. During the design phase, the ability to retrofit the TSP after its current design life will be considered to accommodate additional storage due to impacts from future climate change.

The No Action Alternative would maintain existing conditions for the study area; therefore, no effects to climate change conditions would be anticipated.

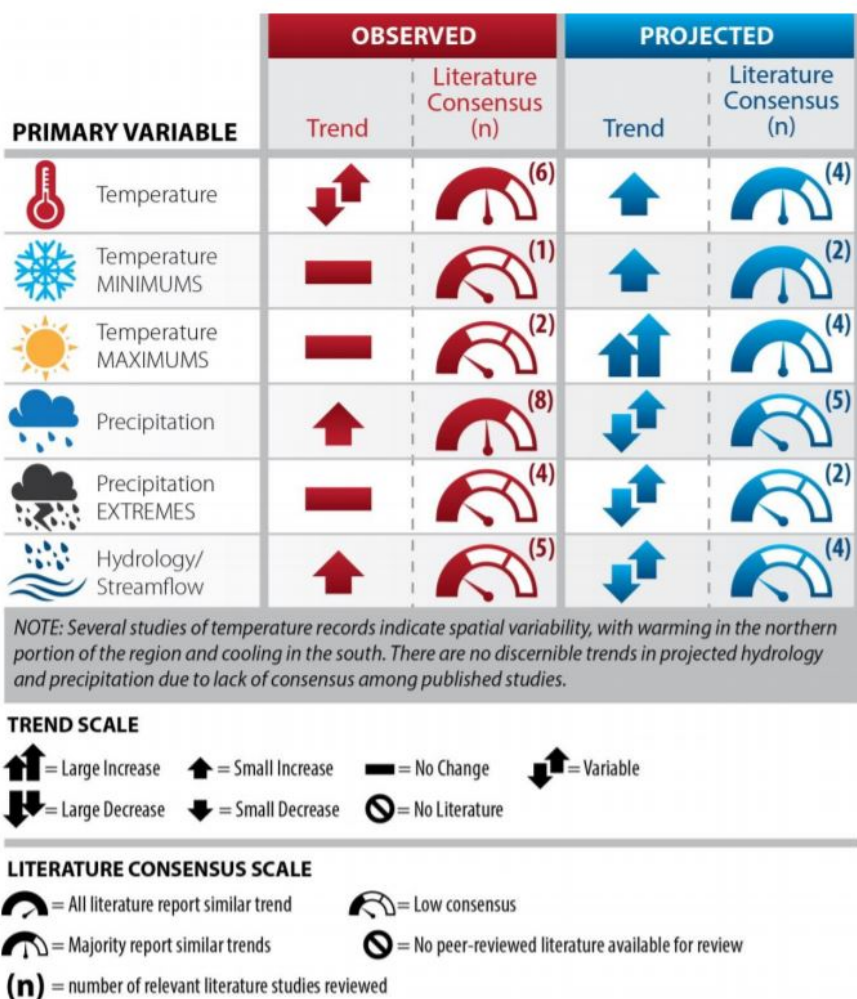
4.2.1 Future Climate Impacts

A cursory qualitative analysis was conducted to examine the potential future impacts of climate change on the TSP. Multiple tools and literature were used for this cursory analysis. The tools and literature have contradictory outlooks for projected climate impacts to the region. The National Oceanic and Atmospheric (NOAA), National Centers for Environmental Information, State Climate Summary for Tennessee states three key messages for the State of Tennessee. The key messages are as follows:

1. Tennessee, like much of the southeastern United States, has exhibited little overall warming over the 20th century. However, under a higher emissions pathway, historically unprecedented warming is projected by the end of the 21st century.
2. Future naturally occurring droughts are projected to be more intense because higher temperatures will lead to more rapid depletion of soil moisture during dry spells.
3. The number and intensity of extreme heat and precipitation events are projected to increase in the future while cold waves are projected to be less intense.

While NOAA predicts an increase in the number of intense precipitation events in the future, findings published by USACE are less conclusive. A report published by USACE (2015) for the Ohio Region 5, which includes Middle Tennessee, titled “Recent U.S. Climate Change and Hydrology Literature Applicable to US Army Corps of Engineers Missions,” concludes that clear consensus is lacking in hydrologic projections. The literature review contained within the report found in some cases that macro-scale hydrologic models indicate a reduction in future stream flows, but in other cases the literature indicates a potential increase in stream flows in the study region. Figure 23 below summarizes the findings of the USACE report.

Figure 23: Summary Matrix of Observed and Projected Climate Trends



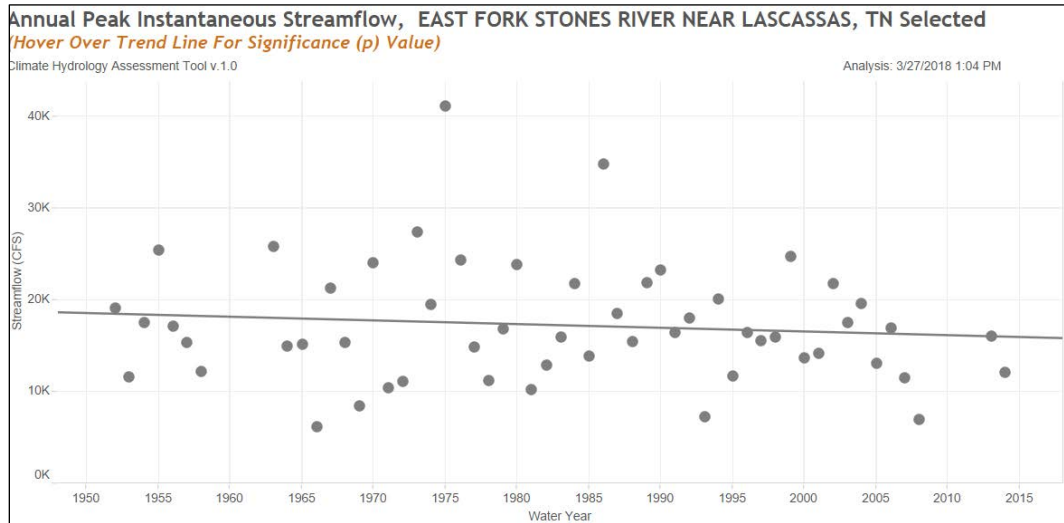
This matrix shows observed hydrology/streamflow have increased with little literature consensus. The projection for precipitation, extreme precipitation and hydrology/streamflow are varied with little consensus.

The USACE Climate Hydrology Assessment Tool also was used to determine potential future impact to the TSP. This tool allows users to easily access both existing and projected climate data to develop repeatable analytical results using consistent information, reducing potential error and increasing the development of information so that it can be used earlier in the decision-making process, ideally in the development of risk registers. This tool includes trend detection in observed annual maximum daily flow, trend detection in observed annual maximum three-day flow, climate-modeled annual maximum monthly flow range, and trend detection in annual maximum monthly flow models. Two gages in the Cumberland River basin (HUC4 0513) were used in the cursory analysis: East Fork Stone near Lascassas, TN (USGS 3427500) and the Harpeth River at Bellevue, TN (USGS 03433500). The two selected gages have a longer period of record than the majority of other gages in the Cumberland River basin. No gage on the Cumberland River was considered for analysis do the highly regulated nature of the Cumberland River.

The first gage analyzed was the East Fork Stone near Lascassas, TN. The gage has a record of 58 years of annual peak streamflow data for the years 1952 to 2014. The gage is missing some important data, most notably the 2010 annual peak flow. The gage exhibits a minor declining trend in annual peak instantaneous

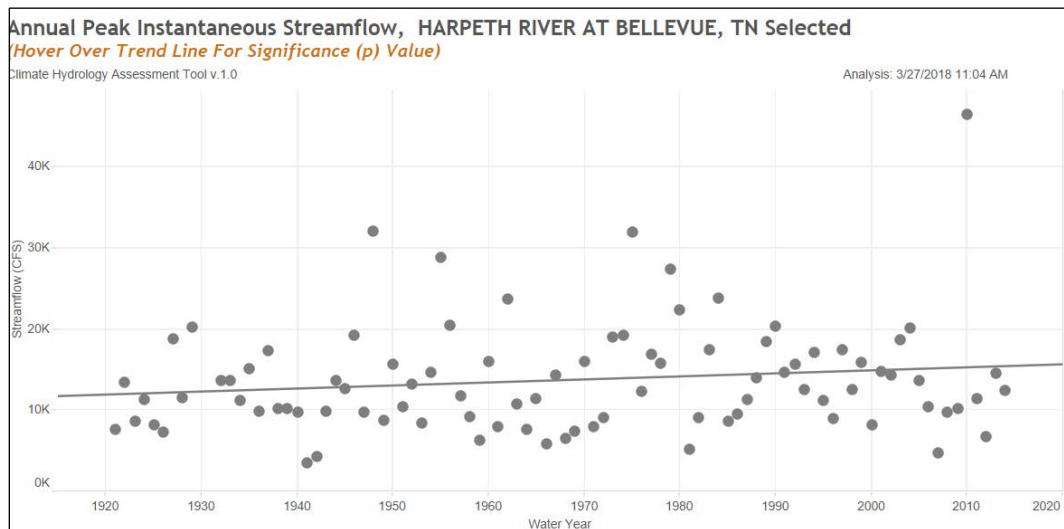
streamflow; however, this trend is not statistically significant as indicated by the high p-value. A p-value of 0.44 was determined for the trend line. The p-value is also known as a probability value, which is the measure of the significance of a present trend in the linear regression analysis. Lower p-values indicate higher significance of the trend. Figure 24 illustrates the peak annual streamflow and the trend line of the data.

Figure 24: Annual Peak Instantaneous Streamflow, East Fork Stone Near Lascassas, TN. p = 0.44



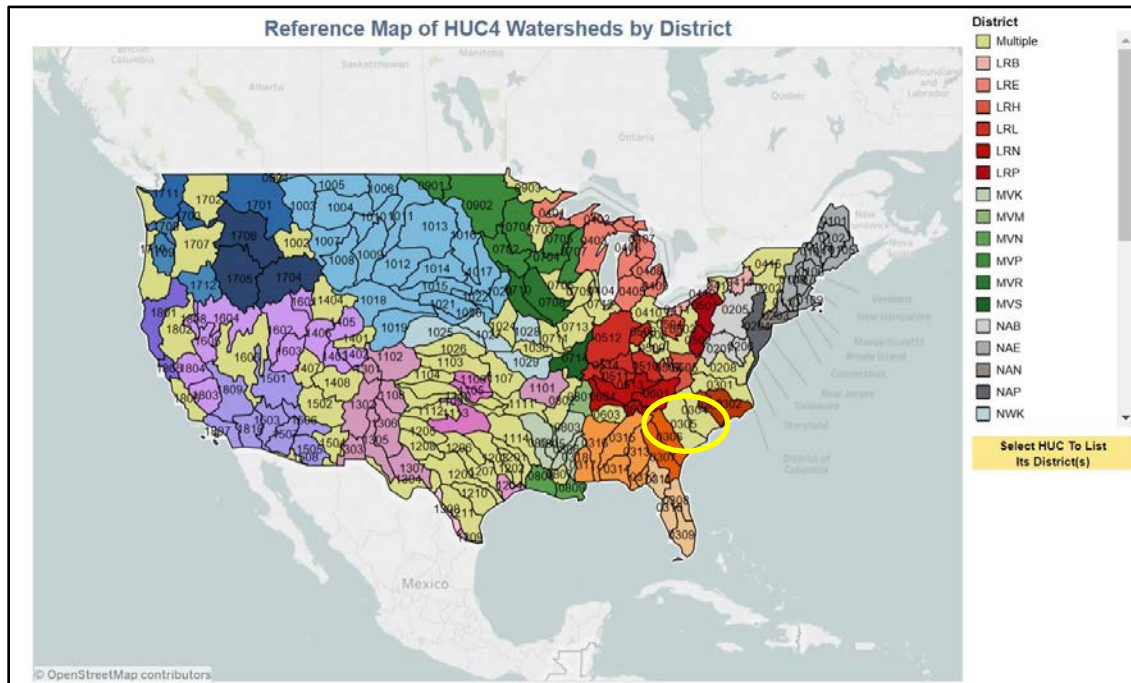
The second gage analyzed was the Harpeth River at Bellevue, TN. This gage has a longer period of record than the previous gage analyzed. The gage has a record of 92 years of peak streamflow data for the years 1921 to 2014. The gage data exhibits a minor positive trend line. The p-value of the trend line of this gage was 0.15, which indicates it may not be a statistically significant trend line. Figure 25 illustrates the data and trend line for the Harpeth River at Bellevue, TN.

Figure 25: Annual Peak Instantaneous Streamflow, Harpeth River at Bellevue, TN. p = 0.15



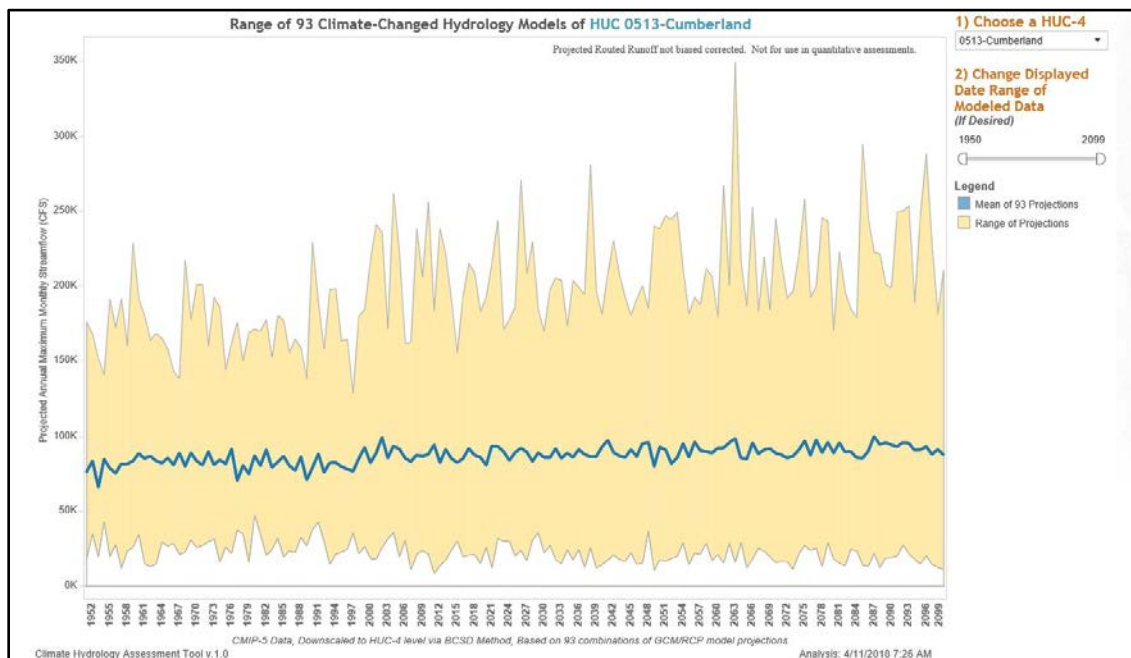
The USACE Climate Hydrology Assessment Tool also includes a projected annual max monthly analysis for the HUC 0513 – Cumberland region. The location of the Cumberland River HUC is shown in Figure 26.

Figure 26: HUC Location Map



The results of this analysis are shown in Figure 27. The tool projects the monthly flows through 2100 using 93 GCM/RCP model projections. For the Cumberland River region, the models predict more variability in the upper range of projections indicating more flow; however, the mean line stays fairly flat without any noticeable increase in rainfall

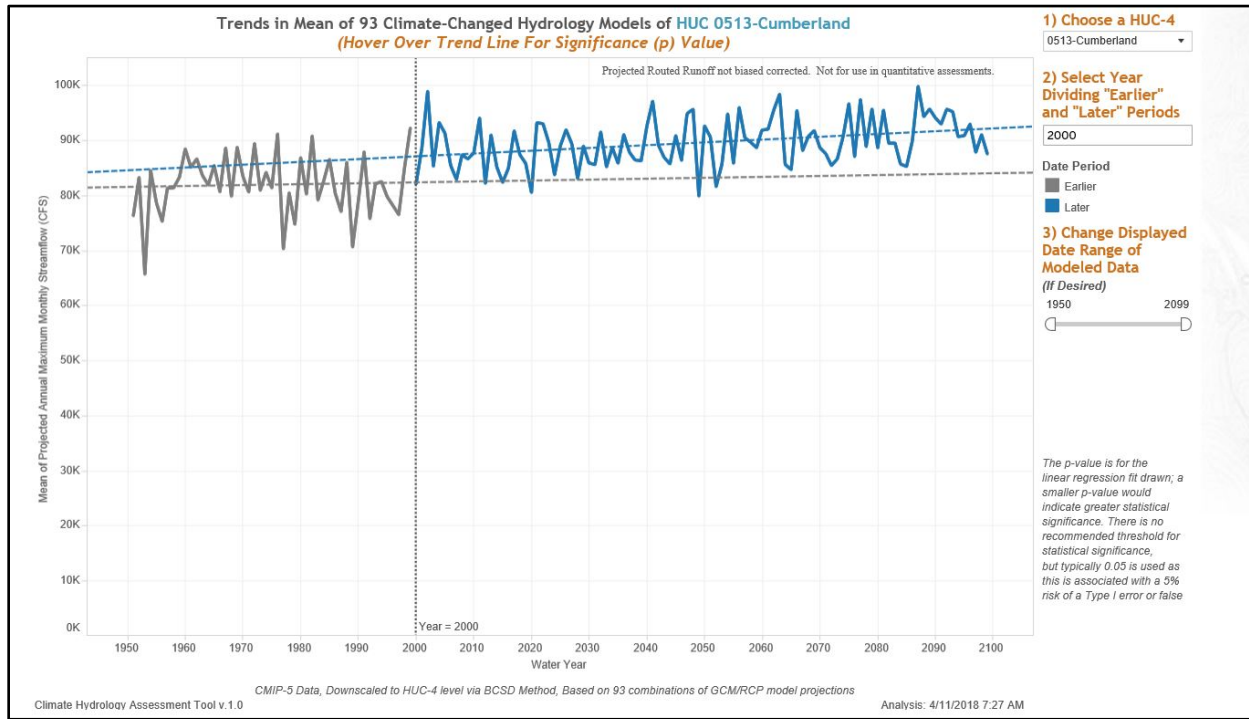
Figure 27: Projected Annual Max Monthly Analysis



The third component of the USACE Climate Hydrology Assessment Tool is the mean projected annual max monthly streamflow. The tool projects an upward trend in the Cumberland River watershed. Based on

the tool we can assume that there will be changes in the annual maximum monthly streamflow trending upward; however, how much the increase might be cannot be quantified using this analysis.

Figure 28: Mean Projected Annual Maximum Monthly Streamflow



The Nonstationarity Detection Tool was also run for the two gages mentioned above. The Harpeth River at Bellevue, TN (03433500) and East Fork Stone near Lascassas, TN (USGS 3427500) gages were both analyzed. The Nonstationarity Detection Tool detected two nonstationarity point during 1971 and 1973. This nonstationarity is most likely due to construction of a low head dam on the Harpeth River at Franklin, TN upstream of the gage at Bellevue, TN.

Figure 29: Nonstationarity Detention Results for the Harpeth River at Bellevue, TN (USGS 03433500)

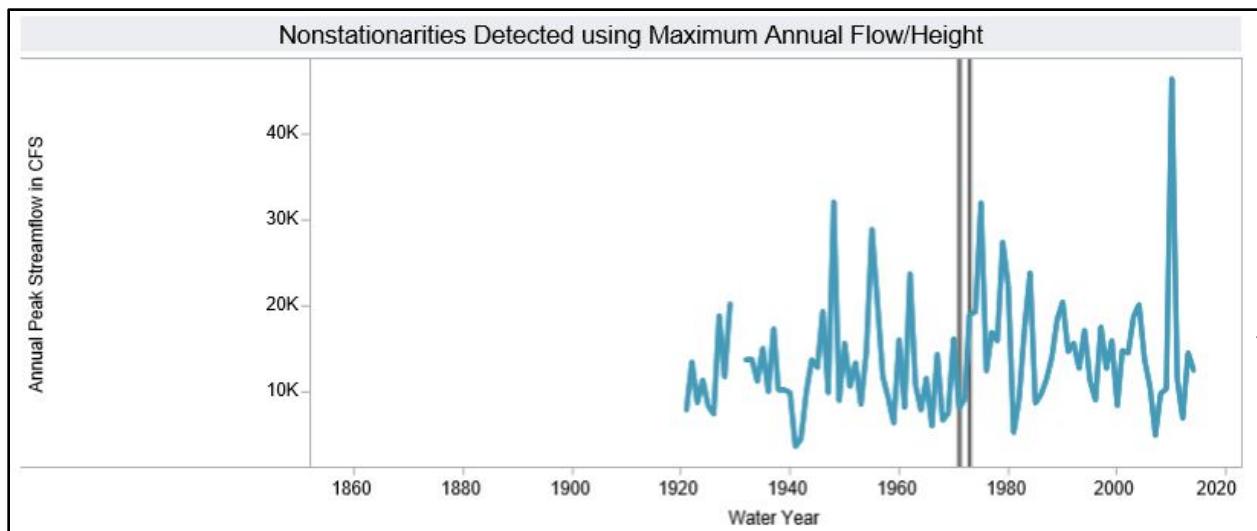
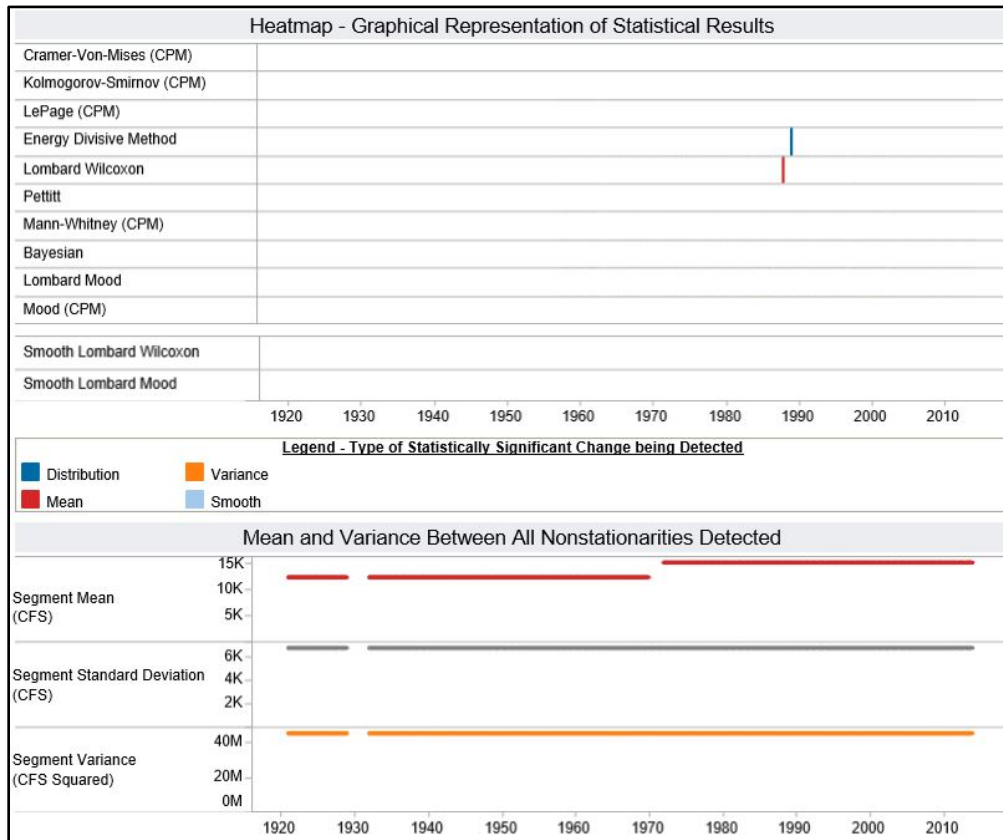


Figure 30: Graphical Representation of Nonstationarity at Harpeth River at Bellevue, TN (USGS 3433500)



The second gage analyzed was the East Fork Stone near Lascassas, TN (USGS 3427500). The Nonstationarity Detection Tool did not detect any nonstationarity data for this gage. Figure 31 and Figure 32 display the result of the Nonstationarity Detection Tool analysis.

Figure 31: Nonstationarity Detention Results for East Fork Stone Near Lascassas, TN (USGS 3427500)

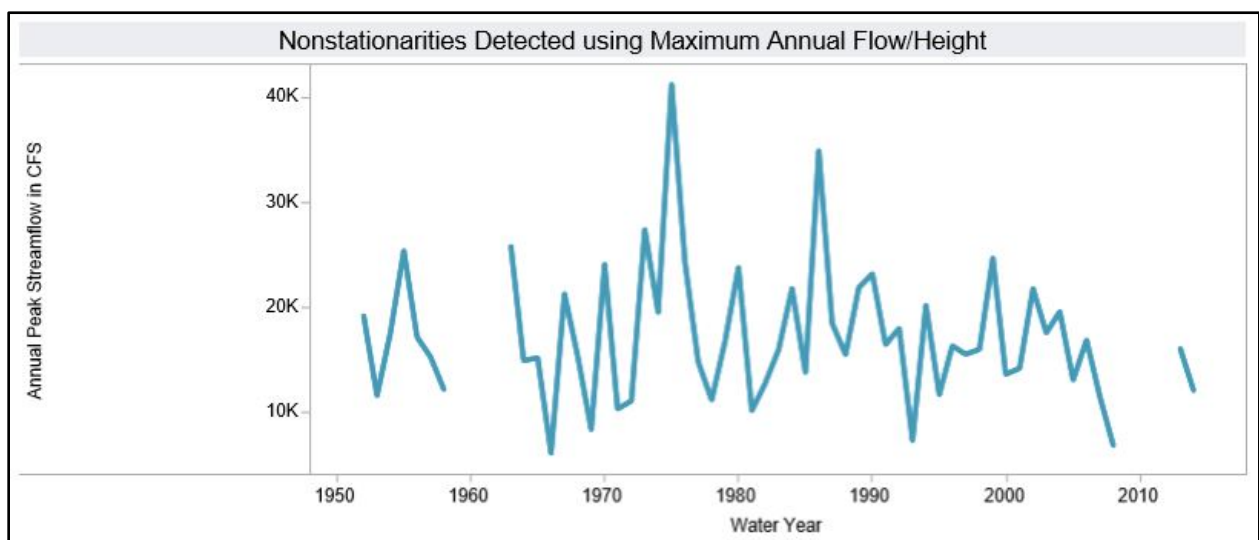
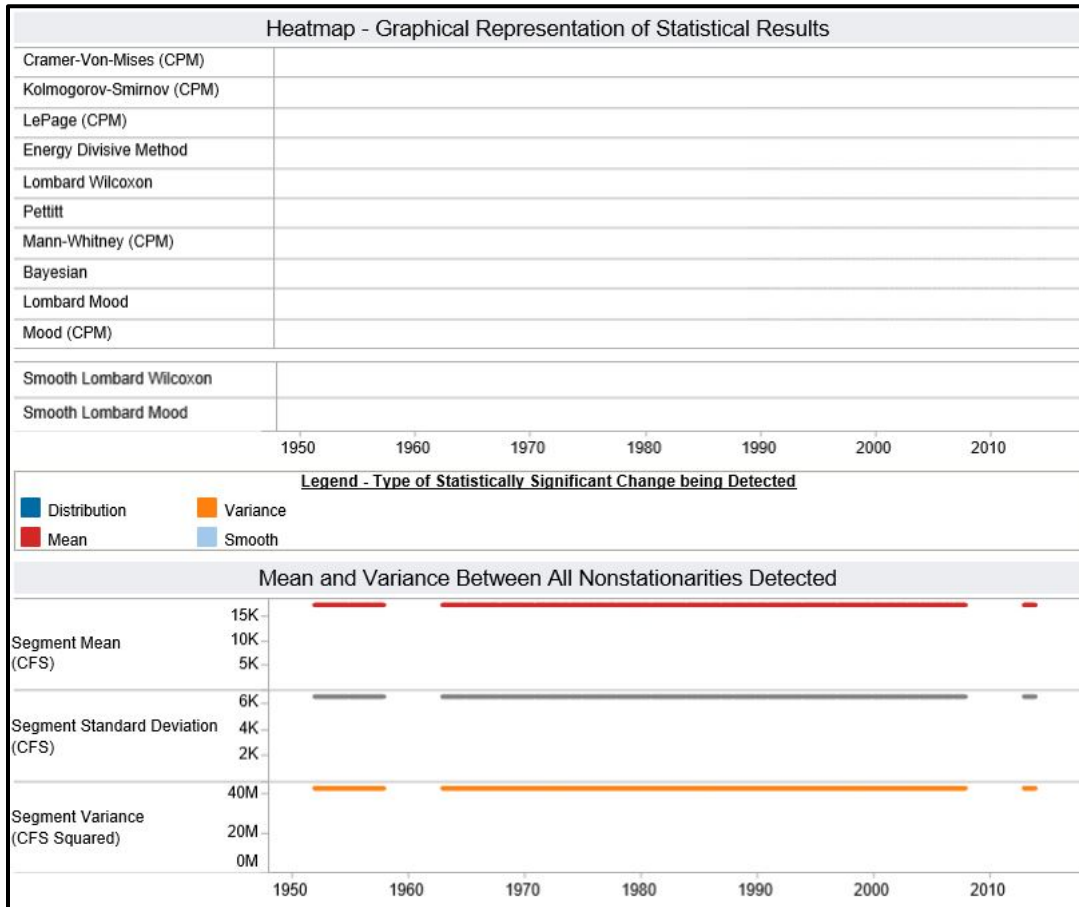
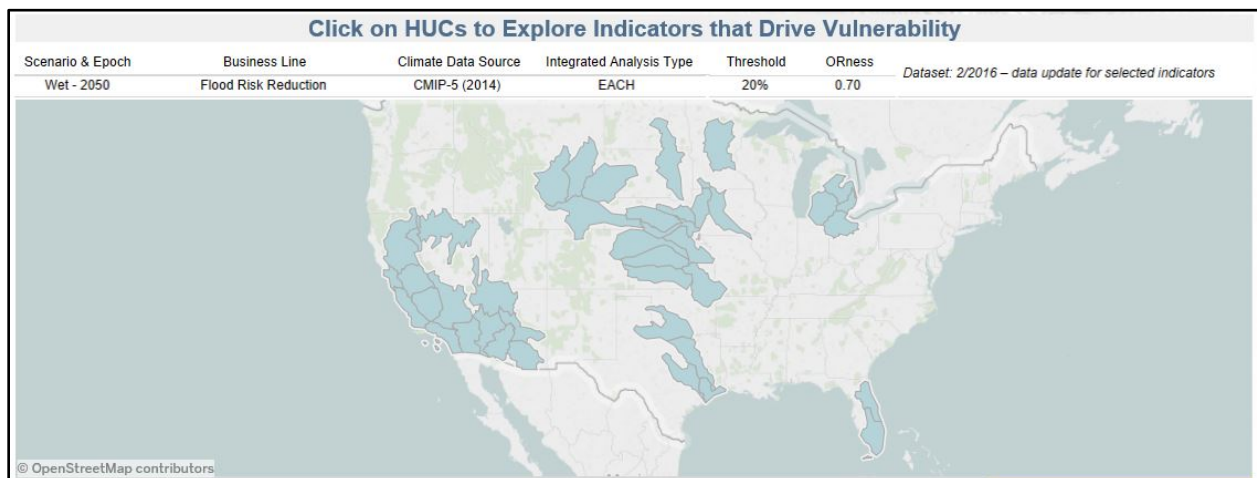


Figure 32: Graphical Representation of Nonstationarity at East Fork Stone Near Lascassas, TN (USGS 3427500)



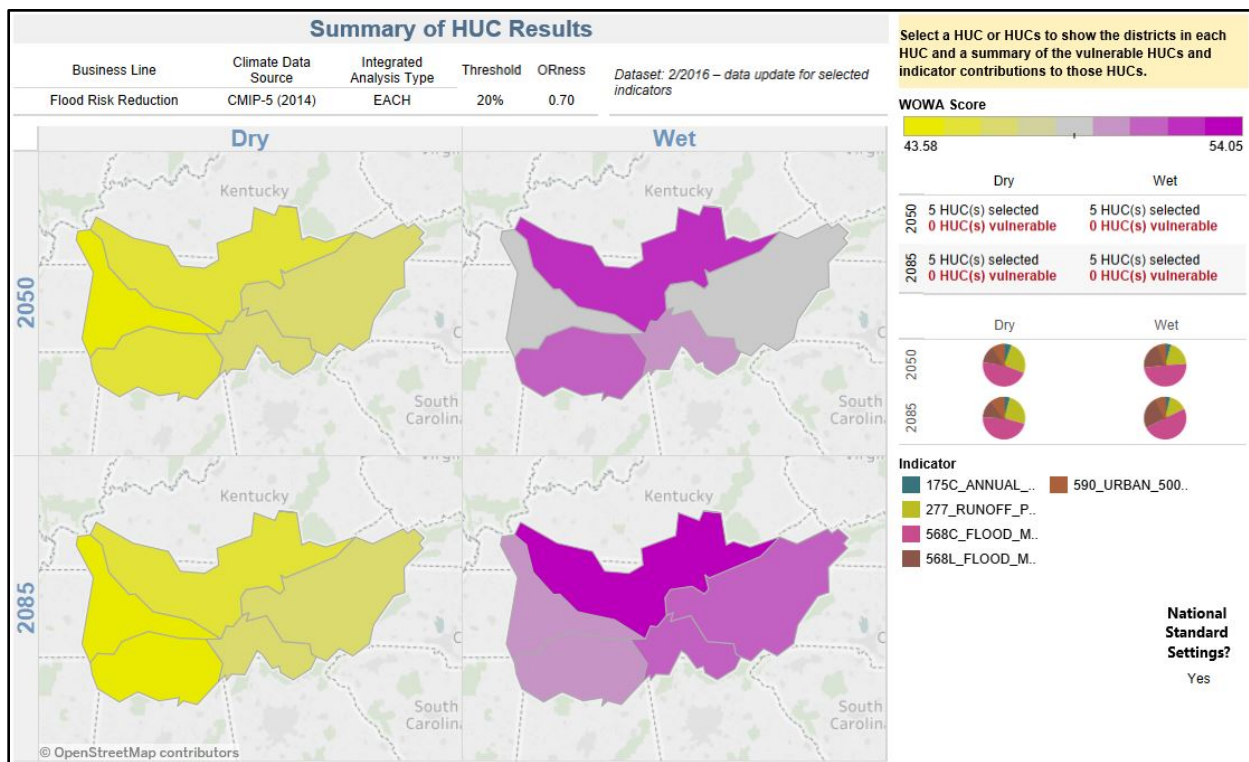
The Cumberland River basin was also analyzed using the Vulnerability Assessment (VA) Tool. The analysis showed that the Cumberland River (HUC 0513) was not in the top 20% of the most vulnerable HUCs in the nation. Figure 33 below shows the top 20% most vulnerable HUCs in the nation. The Cumberland River is not included in the list of most vulnerable HUCs. However, this is not to say that the project is not vulnerable to climate change.

Figure 33: Twenty Percent (20%) Most Vulnerable HUCs in the Nation



There are various indicators that drive the vulnerability of the watershed. Figure 34 shows that summary of the (HEC) results for the flood risk reduction business line. The Cumberland River is most vulnerable to the combination of 568C_Flood_Magnification and 568L_Flood_Magnification indicators. These two indicators make up approximately 70% of the watershed vulnerability. 568C_Flood_Magnification is the change in flood runoff with a ratio of indicator 571C (monthly runoff exceeded 10% of the time, including upstream freshwater inputs) to 571C in base period, and 568L_Flood_Magnification is the change in flood runoff with a ratio of indicator 571L (monthly runoff exceeded 10% of the time, excluding upstream freshwater inputs) to 571L in base period. The other indicators driving the vulnerability of the watershed are the 590_urban_500YRFloodplain_Area and 277_Runoff_Precip. The 590_urban_500YRFloodplain_Area is the acres of urban area within the 500-year floodplain and the 277_Runoff_Precip is the median of deviation of runoff from monthly mean times average monthly runoff divided by deviation of precipitation from monthly mean times average monthly precipitation.

Figure 34: Summary of Flood Risk Reduction HEC results



Based on this assessment, which shows no significant signals, the recommendation is to treat the potential effects of climate change as occurring within the uncertainty range calculated for the current hydrologic analysis.

4.3 SOILS AND GEOLOGY

The recommended plan would necessitate the use of machinery to excavate, fill and grade soils underneath and along the footprint of the project structures. In-situ soil would be excavated and removed. Material will be disposed of in an existing disposal area, as previously identified in Section 3.0. Additional fill material would be needed to construct the proposed project structures. The project should not yield any direct or indirect adverse effect to soils within the project area. As a result of the project, depositing of soils upstream of the project would likely be increased and require maintenance removal in the future. These effects would not be considered significant.

Constructing the proposed project near the entrance of Triple Creek Park would necessitate the removal of existing soils in and along the footprint of the project structures. Hydric soils are not anticipated to be encountered during the construction phase of the project. In the event that hydric soils are encountered at the project, they would be undercut, removed, and replaced with suitable material.

Under the No Action Alternative, flooding downstream of the structure would continue at the current rates. Some erosion and sedimentation would likely continue to occur. No significant adverse effects would be expected.

4.4 SURFACE WATERS AND OTHER AQUATIC RESOURCES

4.4.1 Surface Water

USACE analyzed the effects of the proposed structure to hydrology and hydraulics for Town Creek and the unnamed tributaries of Town Creek, including their floodplains. Riparian vegetation would be removed for approximately 70 linear feet to install the culverts and berm. Placement of the culverts would potentially result in short-term suspension of particulates. Since the substrate is primarily bedrock, there would be very minor amounts of particulates available to suspend. Adverse impacts would be limited to periods of construction and for a short period following activity. After construction, during high flow events, stream velocities would be substantially lowered, potentially allowing particulates to settle out and reducing downstream sedimentation. Permit requirements for the Entrance Detention alternative are detailed in Section 6.4 below.

Changes to stream velocities for both upstream of the structure and downstream of the structure are shown in Figure 35 and Figure 36. Upstream velocities are slowed by more than half, which could lead to additional deposits of sediment during storm events. However, changes to the in-stream habitat and bank erosion are expected to be minimal. Downstream velocities will change very little with no significant adverse impacts expected.

Immediate land use adjacent to and upstream of the project is mostly recreational park use and is expected to continue. Therefore, effects to the streams habitat and resource conditions would not be expected from the No Action Alternative.

Figure 35. Upstream Velocities

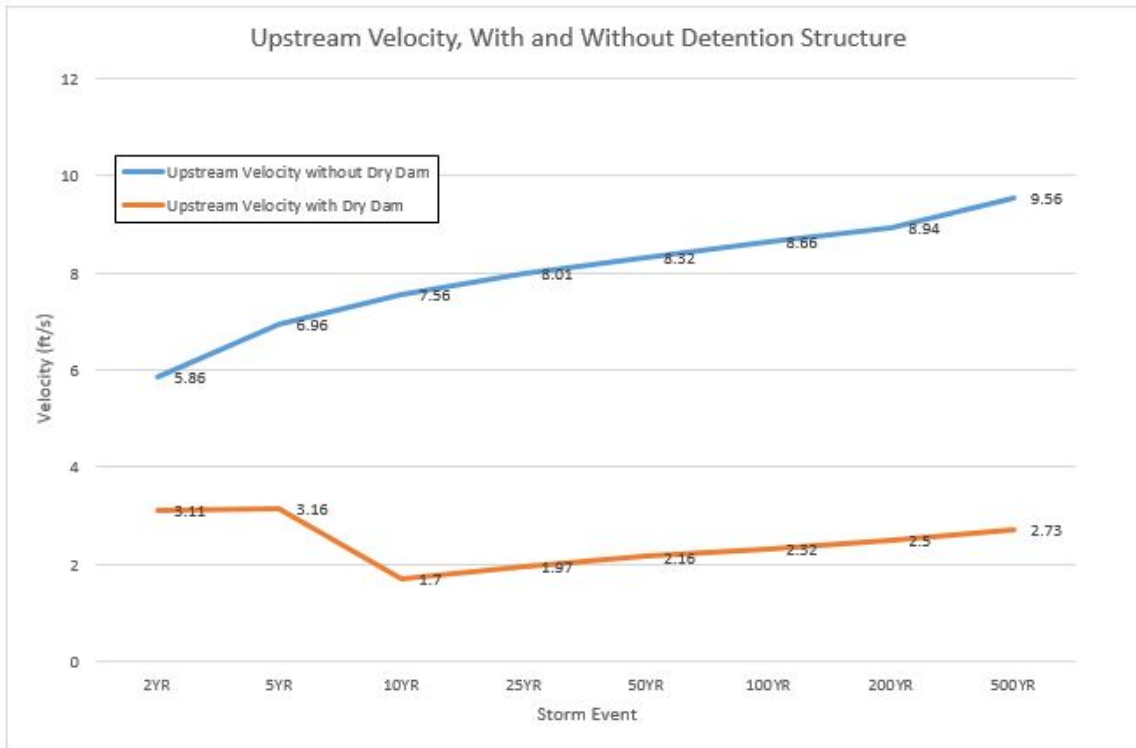
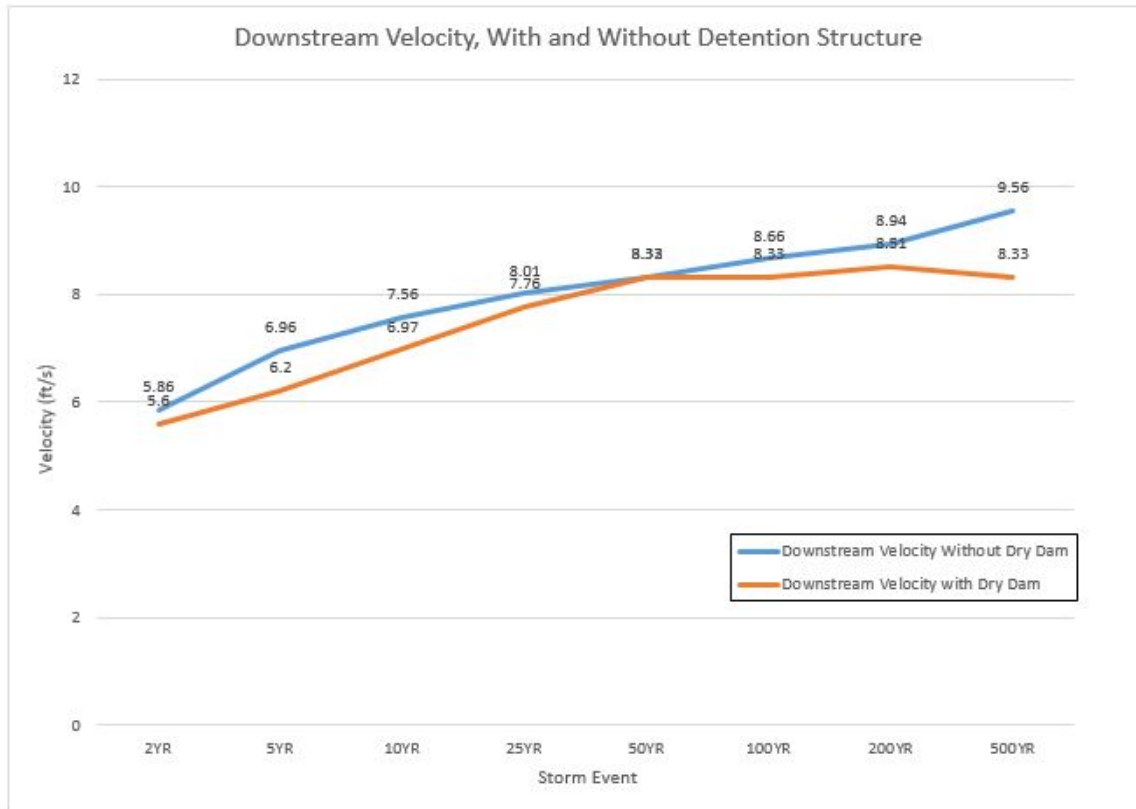


Figure 36. Downstream Velocities



4.4.2 Groundwater

The proposed action would increase the depths and duration of flood events by minor amounts of time (less than 24 hours) up to the 10-year event. The increases could cause a minor amount of increased water volume to infiltrate to the groundwater. This would likely be a benefit by reducing run-off to the stream and extending groundwater input to the stream during low-flow periods. Therefore, the recommended plan would have a positive impact on groundwater in the project area.

No changes to the groundwater would be expected from the No Action Alternative.

4.4.3 Flood Plains

The proposed action alternative would be located in the floodplain. The Entrance Detention dry pond would add fill to the floodplain at Triple Creek Park. Adding material to the floodplain would increase the floodplain capacity upstream of the structure and would benefit the floodplain downstream by reducing water inflow from upstream.

The No Action Alternative would maintain the floodplain as it currently exists. No impacts are expected from a No Action Alternative; however, the existing flood elevations to the adjacent areas would be maintained.

4.4.4 Wetlands

No wetlands exist inside the footprint of the proposed structure; therefore, no fill would be placed into wetlands as part of the proposed action alternative. There is a wetland approximately 1.72 acres in size upstream of the detention structure adjacent to one of the unnamed tributaries. Under the proposed project, additional flooding of the wetland would likely occur. Additional water input would likely be a benefit to the highly impacted wetland. Therefore, no adverse impacts to wetlands are anticipated to occur as part of the recommended plan.

Seeing as the land use (recreational park) for the area around the wetland is stable and not expected to change, no changes to the wetland would be anticipated from the No Action Alternative.

4.5 FISH AND WILDLIFE HABITATS

4.5.1 Aquatic Resources

There would be temporary minor sediment and erosion impacts to the immediate adjacent stream reach; however, they would be kept to a minimum with proper construction best management practices. These minor negative impacts would be temporary in nature for aquatic populations such as fish, amphibians, and invertebrates. Design features such as bottomless culverts are planned; therefore, mobile species would have the ability to relocate to upstream and downstream refugia and return to the area following completion of construction.

Some effects from flooding could include various forms of urban pollution, such as trash, untreated sewer, and industrial run-off. Under the No Action Alternative, this flooding would continue in the same manner as it currently has.

No changes to the aquatic resources would occur as a result of No Action Alternative.

4.5.2 Terrestrial Resources

The proposed action would include building a berm (dry detention structure) with a footprint that would be approximately 1.4 acres. Trees and turf would be permanently removed from the structure footprint, including the riparian buffer near the stream. However, the adjacent areas to the detention structure would still be maintained as forested turf areas. A limited amount of trees may also be removed for the construction

access road. The access road cuts through a hay field, and most of the 1.3 acres for the road footprint are managed as a hay field. This field would be temporarily impacted during construction but would be restored at the construction completion. These impacts to wildlife and habitat would not be considered significant since the area is already well maintained and used by recreating citizens.

No impacts to terrestrial resources would be expected by the No Action Alternative.

4.6 ENDANGERED AND THREATENED SPECIES

4.6.1 Federal

Potential summer roosting habitat for federally listed bat species exists in the study area in the form of snags, which contain cavities and exfoliating bark. Approximately five snags exist in the direct vicinity of the proposed detention structure. The construction of that structure could require the removal of those snags. Any tree removal would be conducted during winter months to reduce potential negative impacts. Based on the timing of a proposed project (3–5 years before construction would begin), USACE would propose to conduct an additional habitat assessment after project designs were finalized. Additional correspondence would then be conducted with the USFWS. Based on cutting any trees in the winter and ensuring additional coordination with the USFWS in the future, USACE finds that the proposed action may affect, but would not likely adversely affect the Indiana bat and the Northern long-eared bat. Section 7 consultation under the Endangered Species Act would be completed prior to issuance of a finding of no significant impact (FONSI).

No trees would be cut or removed as part of the No Action Alternative. Therefore, the No Action Alternative would have no effect on federally listed species.

4.6.2 State

No state listed species are known to occur in the proposed project area. Therefore, no effects are expected from the proposed project or the No Action Alternative.

4.6.3 Critical Habitat

No critical habitat is known to occur in the study area.

4.7 RECREATIONAL, SCENIC, AND AESTHETIC RESOURCES

Under the proposed detention structure alternative, a berm approximately 800 feet long, including the buffers, will be approximately 25 feet to 65 feet wide (depending on the height of the structure). This berm would be sited where currently there is a well-used disc golf course. The portion of the course that is impacted will be relocated or redesigned as part of the project. Because the detention structure would increase flood durations, depths of water, and slow water velocities, additional sediment deposits would occur in the park lands. These deposits would require additional cleaning/removal in the future. All of the current recreational activities would remain after the construction project. Temporary impacts in the form of noise disturbance or temporary rerouting of traffic may occur as part of the construction. The detention structure would blend into the surrounding area with little change. A short length of road would be raised; however, it would not be relocated. No other effects to the aesthetics would be expected. The recommended plan would add some minor amount of flood duration during storm events up to the 2 percent annual chance exceedance storm within areas of Triple Creek Park. However, it would be less than a 10 hour increase. This could cause minor additional soil drying time in athletic fields.

Current recreation and aesthetics would be maintained with the No Action Alternative.

4.8 CULTURAL RESOURCES

In accordance with Section 106 of the National Historic Preservation Act of 1966, 54 U.S.C. §§ 300101, *et seq.*, as amended, and its implementing regulations at 36 C.F.R. part 800, the effects the proposed recommended plan would have on historic properties were taken into account.

USACE defines the physical area of potential effect (APE) as the footprint of the proposed project undertaking, which would consist of the proposed storm water detention structure, associated detention pond and altered 500-year floodplain. USACE also believes the proposed project measure would introduce new visual elements to the viewshed and have the potential to cause visual effects to historic properties. Therefore, USACE defines the visual APE as an 800-meter non-obstructed line-of-sight buffer extending from the physical APE.

There are 37 properties listed in the NRHP within Sumner County, 15 of which are located within 5 miles of Gallatin. No NRHP-listed properties are located within the physical and visual APEs. A records search of the Tennessee Historical Commission's (THC) website, www.tnmap.tn.gov/historicalcommission, identified no architectural properties eligible for listing in the NRHP within the visual and physical APEs. A search of historic topographic maps did not identify any properties eligible for the NRHP. No architectural resources listed or eligible for listing in the NRHP would be affected by the proposed project undertaking.

A search of site files and records at the Tennessee Division of Archaeology conducted on 26 June 2017 indicates three previous archaeological surveys were conducted of the project area. The investigations identified four archaeological sites within the project area, but none fell within the physical area of potential effects (APE) and none would be affected by the proposed undertaking. No historic properties listed or eligible for listing in the NRHP would be affected by the proposed project undertaking.

4.9 AIR QUALITY

The proposed action alternative would not be a source of greenhouse gas emissions. Because the project occurs in an attainment area, a conformity determination/analysis is not required. During construction, heavy equipment would cause minor, temporary air quality impacts; however, all equipment would comply with federal vehicle emission standards, and dust control measures would be implemented during construction. Temporary equipment emissions from this project would be de minimis in nature in terms of the National Ambient Air Quality Standards (NAAQS) and the State Implementation Plan (SIP); as such, a general conformity analysis was not completed.

The No Action Alternative would maintain the status quo, and, therefore, would have no effect on air quality.

4.10 NOISE

The proposed action would cause temporary increases in noise from machinery and equipment during construction. Construction will only occur during daylight hours and will abide by local noise ordinances. These impacts would be temporary and would not result in significant or long-term adverse impacts. There are no sensitive noise receptors that would be impacted by the proposed project.

The No Action Alternative would have no effect on existing noise levels.

4.11 UTILITIES

USACE will coordinate with the City of Gallatin to locate all possible utilities in the construction area. TN 811, the underground utility notification center for Tennessee, shall be notified to locate any underground utilities prior to any excavation. Electrical receptacles for the baseball field facility will be raised a minimum of 20" higher than currently situated. A pad mount transformer was identified in the wood line, near the creek, northeast of the ball fields located just north of the proposed detention structure. This

transformer will most likely need to be raised or relocated. Storm sewer inlets along Champion Drive will also need to be extended/re-located during construction for the elevation of the entrance road. Power poles exist along the east side of Champion Drive near the entrance and may need to be relocated/offset to facilitate the roadwork planned for this area of the park. Underground utilities (electrical/communication) may exist along the east side of the road in this area as well. More survey will be needed to determine the need and extent of relocation for these utilities. Equipment operators should be aware and take care when operating equipment around power poles and overhead power lines.

4.12 TRANSPORTATION

During construction, the main entrance to the park (Champion Drive) will be temporarily closed to facilitate the reconstruction/raising of Champion Drive near the park entrance. Approximately 400 feet of Champion Drive will be demolished and reconstructed so that it summits the detention structure where it intersects the roadway. An alternate access will be constructed approximately 1600 feet west of the main entrance off of Gallatin Pike. The alternate park entrance will allow patrons to enter and exit the park via the Troutt property which lies adjacent to Gallatin Pike and Triple Creek Park just west of the main entrance. The alternate park entrance will utilize the existing turnout and roadway that leads to the proximate cemetery maintenance shed. However, the majority of the access will be constructed across the Troutt property to intersect the existing cul-de-sac near the football fields at the end of Touchdown Drive. All roadways planned to be utilized for construction will need to be evaluated before and after construction to determine if remedial paving is necessary.

4.13 HAZARDOUS AND TOXIC SUBSTANCES

A Phase Ia ESA was conducted for the proposed Entrance Detention Structure within the Triple Creek Park complex in Gallatin, Tennessee to determine if there is any known environmental liability or REC that would interfere with implementation of the flood control project.

Only one environmental record was identified within a 1-mile radius of the proposed Entrance Detention Structure. Adjacent to the east is a commercial area including an auto repair facility and gas station. The gas station, 31E Market, had suspected releases due to two consecutive inconclusive readings during the Statistical Inventory Reconciliation. Common inconclusive results are due to poor measurements, miss-calibrated equipment, or missed deliveries. No confirmation of a release was reported, and the status of the suspected releases was closed. Because there is no confirmed release, the 31E Market is not believed to be a REC, which may impact the proposed Entrance Detention Structure.

No RECs were identified from a historic environmental database records search, current deed review, site reconnaissance, and owner interview that are believed to have impacted the proposed project area. No further ESAs are recommended for the proposed structural measure. Only the current deed has been reviewed for the proposed project. When the feasibility study is accepted and the alternative is to be implemented, at that time a complete historic deed search for environmental liens and covenants will be conducted.

The recommended plan includes clearing existing trees, topsoil stripping, and placement of fill material to construct the retention structure. No RECs were identified within the proposed project area. Therefore, if the proposed plan is initiated, it is not believed that there will be HTRW impacts on the environment. If a REC or a hazardous waste condition were to be uncovered during construction, the cost of remediation and disposal of the REC or hazardous waste will be 100% responsibility of the non-Federal sponsor.

The No Action Alternative will maintain the status quo. If no project were initiated for flood damage reduction, there will be no impact on HTRW into the environment.

A copy of the Phase Ia ESA may be reviewed in Appendix C of this report.

4.14 SOCIOECONOMIC AND ENVIRONMENTAL JUSTICES

The study area is determined to not contain a minority population or low income population as defined by Executive Order (EO) 12898. No negative effects would be borne disproportionately by minority or low-income populations by the proposed action alternative. In addition, the project is in compliance with EO 13045 “Protection of Children from Environmental Health Risks and Safety Risks,” as there are no health or safety concerns affecting children. During a flood event in which the detention structure begins to hold back water, the City of Gallatin will close the baseball fields until the water has receded to safe levels. Therefore, there will not be an increased risk to the health or safety of children as a result of the project.

The No Action Alternative would continue to allow the same level of flood damages to occur in the future. This would continue to damage the public’s well-being and negatively affect economics in the area.

4.15 CUMULATIVE EFFECTS

USACE must consider the cumulative effects of the proposed project on the environment, as stipulated in the NEPA. Cumulative impact is “the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.” 40 C.F.R. § 1508.7.

Geographical boundaries for this discussion of cumulative impacts are the drainage of the Town Creek watershed and the downstream area of benefits that would result from the proposed project reduction in flooding. Temporal boundaries established span from the turn of the 20th century to projections fifty years into the future.

4.15.1 Past and Present Actions

Based on the landscape and land use of the area, development of the floodplain and floodway zones became popular in the watershed many years ago; floodplains continue to receive pressure for structural development. With increasing community growth and decreasing flood storage capacities, increased flood damages to homes and business have occurred. Because of the pressure to develop in the floodplain, there has been extensive impact to riparian vegetation and fauna.

4.15.2 Reasonably Foreseeable Future Actions

Like many communities, it is anticipated that residential as well as commercial development within the watershed would continue until carrying capacity is reached. It is expected that implementation and enforcement of zoning ordinances would be used as a means to reduce damages associated with structural flooding and resource impacts. Other programs and education by watershed stakeholders may also occur as means to improve the quality of the natural resources.

4.15.3 Combined Effects on Resources

The construction of the proposed project would result in some loss of forested turf areas that are currently used for disc golf. There would be some permanent loss of riparian vegetation from the footprint of the detention structure where it would cross the tributary. Management of the floodplain by the city will help to reduce the negative effects of continued future development of the surrounding areas. When combined with past, present, and future actions, the proposed project would not have significant effects to resources.

5.0 MITIGATION OF ADVERSE IMPACTS*

The potential adverse environmental impacts of the Entrance Detention Structure are minor. No mitigation for impacts under the Clean Water Act or Endangered Species Act are anticipated.

6.0 IMPLEMENTATION REQUIREMENTS

6.1 PROJECT PARTNERSHIP AGREEMENT

The City of Gallatin is the NFS for project implementation, as indicated in a letter of intent dated 16 April 2015. The requirements for non-Federal sponsorship are outlined below.

The NFS must provide a minimum cash contribution equal to 5 percent of total project costs allocated to the project, as well as all LERRDs determined by the Federal Government to be required for the project. Additional contributions may include work-in-kind. If the sum of the sponsor's total cash, work-in-kind, and LERRD contributions is less than 35 percent of the costs, the NFS would pay the difference in cash. If it is greater than 35 percent, total non-Federal costs shall not exceed 50 percent of total project costs assigned to flood control. Contributions in excess of 50 percent would be reimbursed by the Federal Government to the NFS, subject to the availability of funds. However, the NFS would be required to pay 100% of costs in excess of the federal per project limit of \$10 million, regardless of whether these costs exceed the 50% contribution. (See ER 1105-2-100, Appendix E, Paragraphs E-21.a.)

Federal implementation of the recommended project would be subject to the NFS agreeing to comply with applicable Federal laws and policies, including but not limited to:

- a. Provide a minimum of 35 percent, but not to exceed 50 percent of total flood damage reduction costs as further specified below:
 - a. Provide, during construction, a contribution of funds equal to 5 percent of total flood damage reduction costs;
 - b. Provide all lands, easements, and rights-of-way, including those required for relocations, the borrowing of material, and the disposal of dredged or excavated material; perform or ensure the performance of all relocations; and construct all improvements required on lands, easements, and rights-of-way to enable the disposal of dredged or excavated material all as determined by the Government to be required or to be necessary for the construction, operation, and maintenance of the flood damage reduction features;
 - c. Provide, during construction, any additional funds necessary to make its total contribution for flood damage reduction equal to at least 35 percent of total flood damage reduction costs;
- b. Shall not use funds from other Federal programs, including any non-Federal contribution required as a matching share therefore, to meet any of the non-Federal obligations for the project unless the Federal agency providing the Federal portion of such funds verifies in writing that expenditure of such funds for such purpose is authorized;
- c. Not less than once each year, inform affected interests of the extent of protection afforded by the flood damage reduction features;
- d. Agree to participate in and comply with applicable Federal floodplain management and flood insurance programs;
- e. Comply with Section 402 of the WRDA of 1986, as amended (33 U.S.C. § 701b-12), which requires a non-Federal interest to prepare a floodplain management plan within one year after the date of signing a project cooperation agreement, and to implement such plan not later than one year after completion of construction of the flood damage reduction features;
- f. Publicize floodplain information in the area concerned and provide this information to zoning and other regulatory agencies for their use in adopting regulations, or taking other actions, to prevent unwise future development and to ensure compatibility with protection levels provided by the flood damage reduction features;
- g. Prevent obstructions or encroachments on the project (including prescribing and enforcing regulations to prevent such obstructions or encroachments) such as any new developments on project lands, easements, and rights-of-way or the addition of facilities which might reduce the

level of protection the flood damage reduction features afford, reduce the outputs produced by the ecosystem restoration features, hinder O&M of the project, or interfere with the project's proper function;

- h. Comply with all applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, as amended (42 U.S.C. §§ 4601–4655), and the Uniform Regulations contained in 49 C.F.R. Part 24, in acquiring lands, easements, and rights-of-way required for construction, operation, and maintenance of the project, including those necessary for relocations, the borrowing of materials, or the disposal of dredged or excavated material; and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act;
- i. For so long as the project remains authorized, operate, maintain, repair, rehabilitate, and replace the project, or functional portions of the project, including any mitigation features, at no cost to the Federal Government, in a manner compatible with the project's authorized purposes and in accordance with applicable Federal and State laws and regulations and any specific directions prescribed by the Federal Government;
- j. Give the Federal Government a right to enter, at reasonable times and in a reasonable manner, upon property that the NFS owns or controls for access to the project for the purpose of completing, inspecting, operating, maintaining, repairing, rehabilitating, or replacing the project;
- k. Hold and save the United States free from all damages arising from the construction, operation, maintenance, repair, rehabilitation, and replacement of the project and any betterments, except for damages due to the fault or negligence of the United States or its contractors;
- l. Keep and maintain books, records, documents, or other evidence pertaining to costs and expenses incurred pursuant to the project, for a minimum of 3 years after completion of the accounting for which such books, records, documents, or other evidence are required, to the extent and in such detail as will properly reflect total project costs, and in accordance with the standards for financial management systems set forth in the Uniform Administrative Requirements for Grants and Cooperative Agreements to State and Local Governments at 32 Code of Federal Regulations (C.F.R.) Section 33.20;
- m. Comply with all applicable Federal and State laws and regulations, including, but not limited to: Section 601 of the Civil Rights Act of 1964, Public Law 88-352 (42 U.S.C. § 2000d) and Department of Defense Directive 5500.11 issued pursuant thereto; Army Regulation 600-7, entitled "Nondiscrimination on the Basis of Handicap in Programs and Activities Assisted or Conducted by the Department of the Army"; and all applicable Federal labor standards requirements including, but not limited to, 40 U.S.C. §§ 3141–3148 and 40 U.S.C. §§ 3701–3708 (revising, codifying and enacting without substantial change the provisions of the Davis-Bacon Act (formerly 40 U.S.C. § 276a, *et seq.*), the Contract Work Hours and Safety Standards Act (formerly 40 U.S.C. § 327, *et seq.*), and the Copeland Anti-Kickback Act (formerly 40 U.S.C. § 276c, *et seq.*));
- n. Perform, or ensure performance of, any investigations for hazardous substances that are determined necessary to identify the existence and extent of any hazardous substances regulated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Public Law 96-510, as amended (42 U.S.C. §§ 9601–9675), that may exist in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of the project. However, for lands that the Federal Government determines to be subject to the navigation servitude, only the Federal Government shall perform such investigations unless the Federal Government provides the NFS with prior specific written direction, in which case the NFS shall perform such investigations in accordance with such written direction;
- o. Assume, as between the Federal Government and the NFS, complete financial responsibility for all necessary cleanup and response costs of any hazardous substances regulated under CERCLA that are located in, on, or under lands, easements, or rights-of-way that the Federal Government determines to be required for construction, operation, and maintenance of the project;

- p. Agree, as between the Federal Government and the NFS, that the NFS shall be considered the operator of the project for the purpose of CERCLA liability, and to the maximum extent practicable, operate, maintain, repair, rehabilitate, and replace the project in a manner that will not cause liability to arise under CERCLA; and
- q. Comply with Section 221 of Public Law 91-611, Flood Control Act of 1970, as amended (42 U.S.C. § 1962d-5b), and Section 103(j) of the WRDA of 1986, Public Law 99-662, as amended (33 U.S.C. § 2213(j)), which provides that the Secretary of the Army shall not commence the construction of any water resources project or separable element thereof, until each non-Federal interest has entered into a written agreement to furnish its required cooperation for the project or separable element.

There are not anticipated to be any NFS constraints that would prevent execution of the Lakes and Rivers Division (LRD) approved model PPA.

6.2 LANDS, EASEMENTS, RIGHTS-OF-WAY, RELOCATIONS AND DISPOSAL AREAS

The NFS will be required to acquire one road easement for the Entrance Detention Structure. The easement will start at the Sumner Cemetery cul-de-sac and go through the Troutt property to the Gallatin Park cul-de-sac. These properties are privately owned. The NFS will be required to acquire 3.88 acres of temporary work area easements. Two out of the three work area easements will be partially on private property and the final work area easement will be on park lands. The construction work area for the road replacement will require 0.35 acres and the NFS is the owner. A disposal area will require approximately 0.50 acres and the area will be located on NFS grounds. The road replacement acts as the park's main entrance and is the public right of way. This road will be relocated easterly to allocate sufficient space for the detention structure's construction. A flowage easement will be required for the project and approximately 45.87 acres will be used for this purpose. A summary of the LERRDs required for the project can be found in Table 1 and 2 of the Real Estate Plan in Appendix B to this report. The capability assessment has been completed and the NFS is considered moderately capable, meaning they are financially capable, have the authority to hold title, and can provide with contractor support the necessary services required to provide LERRD. Under the No Action Alternative, there would be no LERRDs acquisition.

6.3 OPERATION, MAINTENANCE, REPAIR, REPLACEMENT, AND REHABILITATION

Once construction activities are completed, the project would be turned over to the City of Gallatin. Ongoing operation, maintenance, repair, replacement, and rehabilitation (OMRR&R) of the project would be the responsibility of the City of Gallatin. OMRR&R activities would include periodic inspections, mowing, debris removal, litter control, vermin control, maintenance and repair of proposed structure, and other associated activities. The estimated annual cost of these activities is \$10,160.

6.4 REGULATORY REQUIREMENTS*

6.4.1 Clean Water Act

6.4.1.1 Section 404/401

Impacts to streams and wetlands associated with flood control measures were evaluated for compliance with Section 404 of the Clean Water Act administered by USACE. Riparian vegetation would be removed for approximately 70 linear feet to install the culverts and berm. Placement of the culverts would potentially result in short-term suspension of particulates. Since the substrate is primarily bedrock, there would be very minor amounts of particulates available to suspend. Adverse impacts would be limited to periods of construction and for a short period following activity. After construction, during high flow events, stream velocities would be substantially lowered, allowing particulates to settle out and reducing downstream sedimentation. A Section 404(b)(1) analysis was completed for the proposed action. The conclusion was

that the proposed discharge of fill material is in compliance with requirements of the guidelines, with the inclusion of appropriate conditions and construction best management practices (BMPs) to minimize impacts to the aquatic ecosystem. A Section 401 water quality permit from the State of Tennessee would be required and shall be obtained prior to construction. Also, there would be no significant adverse effects to aquatic resources, and no compensatory mitigation is currently anticipated.

6.4.1.2 National Pollution Discharge Elimination System (NPDES)

A National Pollutant Discharge Elimination System (NPDES) permit for stormwater discharge is required when construction or land disturbance exceeds one acre. This permit would be requested prior to construction where necessary.

6.4.2 Fish and Wildlife Coordination Act

USACE is required to coordinate water resource project proposals with the U.S. Fish and Wildlife Service (USFWS) and the Tennessee Wildlife Resource Agency (TWRA) under the Fish and Wildlife Coordination Act (FWCA) (16 U.S.C. §§ 661, *et seq.*). Coordination with USFWS and TWRA was initiated through a scoping letter submitted 10 August 2017. Comments were received from the USFWS (see chapter 7 for summary). No comments were received from TWRA. Comments are incorporated in this document and included in Appendix G. Coordination would continue with the review of this draft report and any comments would be included in the final report.

6.4.3 Endangered Species Act

The Endangered Species Act requires the determination of possible effects on, or degradation of, habitat critical to federally listed endangered or threatened species. As previously mentioned above in Section 4.0, in a letter dated 11 August 2017, the USFWS stated that no federally protected species or critical habitat are known to occur in the study area. They also stated, however, that the project would occur within the summer range of the federally endangered Indiana bat (*Myotis sodalis*) and federally threatened northern long-eared bat (*Myotis septentrionalis*). During a site visit on 10 July 2017, USACE biologists identified potential bat habitat. Approximately five snags exist in the direct vicinity of the proposed detention structure. The construction of that structure could require the removal of those snags. Any tree removal would be conducted during winter months in order to reduce potential negative impacts. Based on the timing of a proposed project (3–5 years before construction would begin), USACE would propose to conduct an additional habitat assessment after project designs were finalized. Additional coordination would then be conducted with the USFWS. Based on cutting any trees in the winter and ensuring additional coordination with the USFWS in the future, USACE finds that the proposed action may affect, but would not adversely affect the Indiana bat and the Northern long-eared bat.

6.4.4 National Historic Preservation Act

Section 106 of the National Historic Preservation Act of 1966 (NHPA), as amended, and its implementing regulations at 36 C.F.R. part 800 require consideration of historic properties prior to a federal undertaking and require consultation with the State Historic Preservation Officer (SHPO), federally recognized tribes with a connection to the project location and other consulting parties defined at section 800.3. The NHPA only affords protection to sites, buildings structures, or objects listed in or determined eligible for listing in the NRHP. USACE initiated Section 106 consultation with the Tennessee SHPO and six federally recognized Native American Tribes in August 2017. The SHPO and consulting parties that responded to USACE concurred with a “no historic properties affected” determination.

6.4.5 Floodplain Management

Executive Order (EO) 11988 (24 May 1977), 42 Fed. Reg. 26,951, outlines the responsibilities of Federal agencies in the role of floodplain management. In accordance with this EO, USACE is required to evaluate the potential effects of actions on floodplains and does not undertake actions that directly induce growth in the floodplain, unless no practical alternative exists. Construction of structures and facilities on floodplains

must incorporate flood proofing and other accepted flood protection measures. Agencies must attach appropriate use restrictions to property proposed for lease, easement, right-of-way, or disposal to non-Federal public or private parties.

The eight steps associated with the decision making process in EO 11988 were considered in the evaluation of the selected alternative. See Table 14 for more detail on how each step was considered. Based on the findings and determination discussed in this report, the selected alternative is in compliance with EO 11988. The proposed action would serve to reduce the damaging effects of flooding and improve the overall quality of the floodplain; it would not be directly encouraging growth within the floodplain.

Table 14. Eight Steps of Decision Making Process in EO 11988

Determine if a proposed action is in the base floodplain.	Yes, the proposed alternatives are within the base floodplain.
Conduct early public review, including public notice.	A scoping letter was posted in August 2017. Initial comments were received and logged as Appendix G. Additional Draft EA Review to be conducted.
Identify and evaluate practicable alternatives to locating in the base floodplain, including alternative sites outside of the floodplain.	See Section 3.0, Plan Formulation, for description and evaluation of each alternative considered.
Identify impacts of the proposed action.	See Section 4.0 for description of impacts related to the selected alternative.
If impacts cannot be avoided, develop measures to minimize the impacts and restore and preserve the floodplain, as appropriate.	The selected alternative would create additional water storage in the floodplain above the detention structure. The addition of flooding frequency and duration would likely benefit riparian and limited wetland habitat. Potential sources of debris/wastes that follow floods would be reduced downstream of the project.
Reevaluate alternatives.	See Section 3.0
Present the findings and a public explanation.	This document would serve as a tool to present the findings and would provide the public a detailed explanation of how the selected plan was chosen. Upon approval to release the draft report, the NEPA public comment period would occur and include additional public input.
Implement the action.	This action would follow final approvals of the selected alternative.

7.0 PUBLIC INVOLVEMENT*

Preparation of this integrated DPR and EA includes agency and public notification of the proposal and an opportunity for agency and public review and comment prior to agency decision making. A scoping letter was issued to the public for a 30-day comment period on 10 August 2017. Comments were received mostly from state and federal agencies. Comments were considered and addressed in the sections above. An additional 30-day public review and comment period of the draft DPR and EA will be conducted in the near future. Comments received at that time will be included in the final report.

7.1 STAKEHOLDER AGENCY COORDINATION

The 2017 scoping letter was sent to agencies and stakeholders listed below and in Appendix G. Comments were received from the following stakeholders:

7.1.1 Federal Agencies

7.1.1.1 Environmental Protection Agency (EPA)

The EPA stated that USACE may want to consider how the detention structures could impact the migration of terrestrial aquatic species and may also want to collaborate with TWRA to determine any potential impacts to terrestrial aquatic species. They also suggested that USACE may want to provide the CWA 404(b)(1) documents for this project as an appendix in support of any wetland and stream mitigation decisions and to help TDEC evaluate stream impact requirements for the CWA Section 401 water quality permit. They also requested two hard copies of the draft documents with one electronic version be sent to the Region 4 headquarters in Atlanta.

7.1.1.2 U.S. Fish and Wildlife Service (USFWS)

The USFWS provided opinions and suggestions regarding general impacts that could be caused by the proposed alternatives. They stated that, according to their records, no listed species or their habitats occurred within the East Camp Creek watershed, which includes the study area. However, they stated the project would occur within the summer range of the federally endangered Indiana bat (*Myotis sodalis*) and federally threatened northern long-eared bat (*Myotis septentrionalis*). They recommended that the USACE consider potential effects to these listed species during this review. They also recommended that disturbance of the suitable roosting habitat be avoided and minimized to the greatest extent possible.

7.1.2 State Agencies

7.1.2.1 Tennessee Historical Commission (THC)

Consultation with the THC was initiated via letter dated 11 August 2017 discussing the components of the flood reduction project and the findings of the cultural review. The USACE recommended a “no historic properties affected” determination. The THC concurred with the USACE findings in a letter dated 25 August 2017. Therefore, this action complies with Section 106 of the NHPA.

7.1.2.2 Tennessee Safe Dams

USACE LRN coordinated with Tennessee Safe Dams on permit requirements as well as what is considered a dam by the State of Tennessee. If the structure is designed and built by USACE and at least 50% of the construction cost is provided by USACE, then a state permit is not required. USACE will provide Tennessee Safe Dams with the plans and specification and engineering report for their reference and comment.

7.1.2.3 Tennessee Department of Environment and Conservation (TDEC) Office of Policy and Planning (POL)

TDEC’s POL provided the EPA’s EJSCREEN Tool output for a 1-mile radius around the proposed project area. EJSCREEN provides a preliminary screening of demographic information.

7.1.2.4 TDEC Division of Water Resources

TDEC’s Division of Water Resources suggested that any increase in channel capacity should prioritize increasing floodplain storage at elevations above the ordinary high water mark, off-line detention measures should be vigorously explored, and any instream detention may require compensatory mitigation to result in no net loss to state waters. They stated that detention structures may qualify as dams and need construction certificates from the Tennessee Safe Dams program. They encouraged further discussion with Jimmy Smith, manager of the Division’s Natural Resources Unit, regarding an Aquatic Resources Alteration Permit (ARAP) and a Dam Safety Certificate.

7.1.3 Local Agencies

No comments have been received from local agencies to date.

7.1.4 Tribes

Consultation was initiated with six federally recognized Native American Tribes in letters dated 11 August 2017. These included: United Keetoowah Band of Cherokee Indians, Absentee-Shawnee Tribe of Indians of Oklahoma, Cherokee Nation, Eastern Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, and the Shawnee Tribe. The initiation letter discussed the components of the flood reduction project and the findings of the cultural review. USACE recommended a “no effects to historic properties” determination. The Absentee-Shawnee Tribe of Indians of Oklahoma responded in a letter dated 9 September 2017 concurring with the USACE’s determination. The Shawnee Tribe responded in a letter dated 28 August 2017, concurring with the USACE’s determination. Both tribes requested to be notified immediately upon the discovery of human remains, funerary objects or archaeological artifacts and that all activities cease if such a discovery were made.

USACE did not receive any responses from the remaining five Native American tribes: United Keetoowah Band of Cherokee Indians, Cherokee Nation, Eastern Band of Cherokee Indians, and the Eastern Shawnee Tribe of Oklahoma. Pursuant to 36 C.F.R. § 800.4(d)(1)(i), no response from the tribes after the 30 day comment period implies concurrence with the USACE's original findings and fulfills consultation requirements under Section 106 of the NHPA. This action is in compliance with the NHPA. Please reference Appendix H for information regarding Section 106 consultation with the THC and federally recognized Native American tribes.

7.1.5 Non-Governmental Organizations

No comments have been received from non-governmental organizations to date.

8.0 FINDING OF NO SIGNIFICANT IMPACT

The FONSI reflects all agency coordination and public comments that are drawn and can be found in Appendix G.

9.0 RECOMMENDATION*

After considering the significant engineering, economic, environmental, and social aspects of the problems and solutions presented in this report, it is recommend that the Tentatively Selected Plan (Entrance Detention) be authorized as a Federal project with such modifications thereof as in the discretion of the Chief of Engineers may be advisable and in accordance with cost sharing and financing arrangements which are satisfactory to the President and Congress. Also, based on the effects of the project documented previously in the report (Section 4.0), the Entrance Detention would not be expected to have significant impacts on the human environment.

The estimated total first cost of this project is \$1,921,000 (2018 prices). Federal first costs are estimated at \$1,249,000, and non-Federal first costs are estimated at \$672,000 (the costs of lands, easements, rights-of-way, relocations, and disposal areas, plus a mandatory 5% cash contribution). Annual non-Federal operation and maintenance (O&M) costs are estimated at \$10,160. It is further recommended that implementation of the Tentatively Selected Plan be subject to the sponsor entering into a written agreement with the Secretary of the Army to carry out the required items of local cooperation in accordance with the provisions of Section 205 of Public Law 80-858. The Federal funding limit for a CAP Section 205 is \$10,000,000; this project will be within the limits of this authority.

The recommendations contained herein reflect the information available at this time and current agency policies governing formulation of individual projects. They do not reflect program and budgeting priorities inherent in the formulation of a national Civil Works construction program nor the perspective of higher review levels.

10.0 LIST OF PREPARERS

Table 15. Gallatin 205 PDT

Role	PDT Member
Project Manager / Planner	Lacey Thomason, P.E.
Project Engineer / Hydraulic Engineer	Aras Barzanji, P.E.
Biologist	Chip Hall
Structural Engineer	Mike Light
Geotechnical Engineer	Jonathan Truelove
Cultural Resources	Jordan McIntyre
Economist	Phillip Jones
Cost Estimator	T.J. Ward, P.E.
HTRW	Chris Stoltz
Real Estate Specialist	

11.0 REFERENCES

USACE LRN. May 2010 Post Flood Report, 14 February 2012

USACE LRN. Town Creek Watershed FPMS Study, December 2012

USACE LRN. Supplemental Flood Preparedness Products, 2013

USDA Natural Resources Conservation Service Soils Surveys

US Geological Survey. Hydrologic Investigations Atlas 730-K, 1995

United States Environmental Protection Agency. Greenbook. Tennessee Nonattainment/Maintenance Status for Each County by Year for All Criteria Pollutants. Website:
https://www3.epa.gov/airquality/greenbook/anayo_tn.html 2018

East Camp Creek Watershed Gallatin, Tennessee

Section 205, Flood Risk Management

Environmental – Appendix g



**US Army Corps
of Engineers**
Nashville District

TABLE OF CONTENTS

A. Corps Scoping Letter	3
B. Public and Agency Responses to Scoping	8
C. Clean Water Act 404 (b)(1) ANALYSIS	24
D. Unsigned FONSI.....	37

A. CORPS SCOPING LETTER



IN REPLY REFER TO

DEPARTMENT OF THE ARMY
NASHVILLE DISTRICT, CORPS OF ENGINEERS
110 9TH AVENUE SOUTH, ROOM A-405
NASHVILLE, TENNESSEE 37203

AUG 10 2017

Project Planning Branch

TO ALL INTERESTED PARTIES:

The U.S. Army Corps of Engineers, Nashville District in accordance with the National Environmental Policy Act (NEPA) is preparing a Feasibility Study and Environmental Assessment (EA) to assess the impacts of proposed flood risk management (FRM) measures for the City of Gallatin, Sumner County, Tennessee (enclosure 1). The EA would provide the basis for a decision whether to proceed with preparation of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact.

The City of Gallatin is located in Middle Tennessee in Sumner County. The city lies 25 miles north of Nashville. East Camp Creek watershed lies in the southeastern part of Sumner County covering a total of 46.2 square miles. The watershed has a long history of flood damages. Flooding occurred in 1926, 1975, 1978, and 2010. This study is being conducted under the authority of section 205 of the Flood Control Act of 1948, as amended. Projects implemented under this authority are formulated for structural or non-structural measures for flood damage reduction.

There are three action alternatives to be analyzed in the study in addition to a No Action Alternative. All three action alternatives considered are detention structures located in Gallatin's Triple Creek Park on two unnamed tributary creeks (see enclosure 2) which would be designed to hold higher flood waters for a time in order to more slowly release them downstream. The No Action Alternative, would be no FRM measures being implemented. Consideration of the "No Action" alternative is required under NEPA (where no federal action or work would be done). The impacts of the "No Action" alternative are used as a baseline to compare impacts of other alternatives considered. The Entrance Detention Structure alternative would be a structure located near the entrance of the park close to Highway 31E. The Touchdown Detention Structure alternative would include raising the elevation of Touchdown Drive to act as a detention structure. The third alternative would be a combination of Entrance and Touchdown Detention Structures. Other measures that have been considered but will not be considered in detail due to various reasons include stream bank modifications, bridge removal/modifications, and nonstructural measures including structure raising/removal.

By way of this letter, the Corps is soliciting public and agency comments concerning environmental or socioeconomic issues that should be addressed in the course of the NEPA process. We encourage comments not only about the immediate project area, but also of plans or proposals for any other development that may impact or influence project resources. This letter also serves to initiate the public involvement requirements of Section 106 of the National Historic Preservation Act of 1966, as amended. Section 106, implemented by regulations at 36 CFR 800, requires the Corps of Engineers to consider the effects of its undertakings on historic

properties. If required, appropriate architectural and archeological investigations would be conducted within those areas affected by the proposed activities and resulting findings would be coordinated with the Tennessee State Historic Preservation Officer, Federally Recognized Tribes, and other consulting parties.

Comments may be submitted within 30 days to the address on the letterhead or electronically to CorpsLRNPlanningPublicCom@usace.army.mil. For additional information regarding the proposed project, please contact Chip Hall at (615)736-7666.

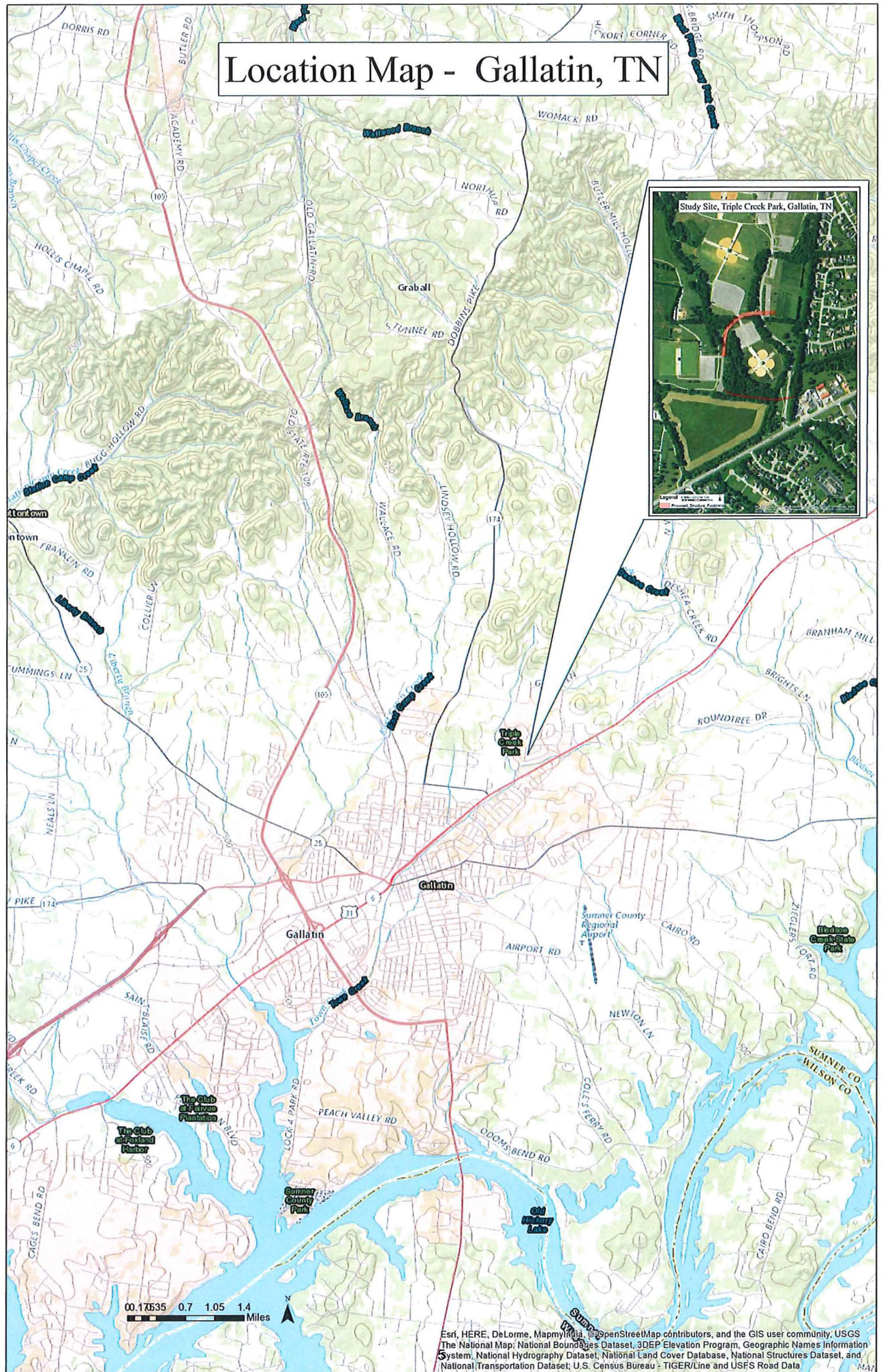
Sincerely,

A handwritten signature in cursive script that reads "Jim Higer".

for Craig D. Carrington
Chief, Project Planning Branch

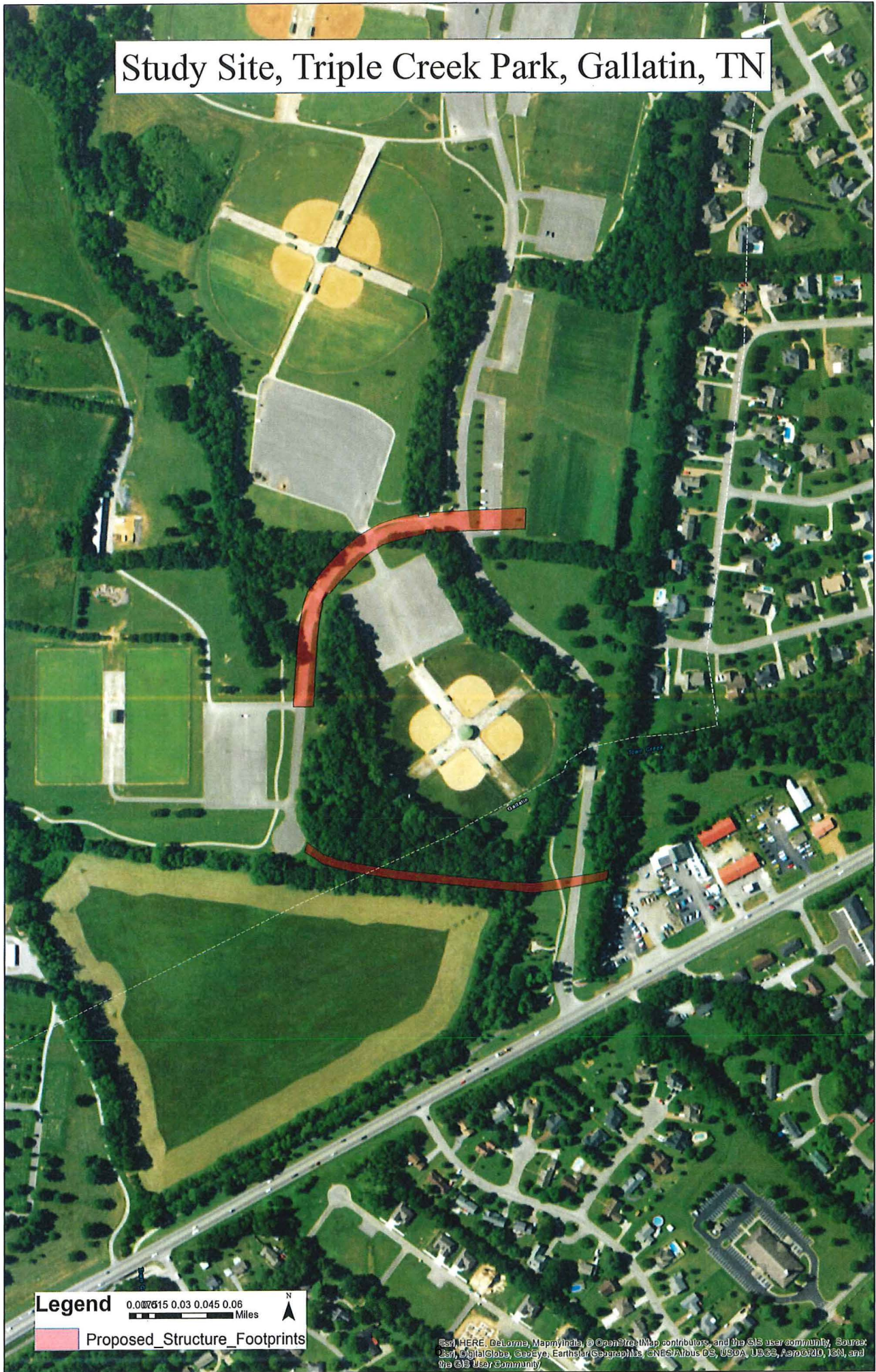
Enclosures

Location Map - Gallatin, TN



Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community; USGS The National Map; National Boundaries Dataset, 3DEP Elevation Program, Geographic Names Information System, National Hydrography Dataset, National Land Cover Database, National Structures Dataset, and National Transportation Dataset; U.S. Census Bureau - TIGER/Line and USFS Road Data

Study Site, Triple Creek Park, Gallatin, TN



B. PUBLIC AND AGENCY RESPONSES TO SCOPING

From: Long, Larry
To: LRN Planning Public Communication
Cc: Militscher, Chris
Subject: [Non-DoD Source] Gallatin Flood Control Project
Date: Thursday, August 10, 2017 1:55:40 PM

Chip Hall

United State Army Corps of Engineers

Nashville District

110 9th Ave.

Nashville TN

I have reviewed the scoping materials provided by the Nashville District Army Corps of Engineers (USACE) for the proposed flood control project located in the City of Gallatin, Sumner County, Tennessee. The USACE is preparing a Feasibility Study and Environmental Assessment (FS/EA) to assess the impacts associated with Flood Risk Management (FRM) for the City of Gallatin. The findings from this study may provide the basis for the USACE decision to proceed with the preparation of an Environmental Impact Statement (EIS), if so indicated.

The EPA Region 4 NEPA Program Office provides the following comments and recommendations for your consideration. USACE has proposed three action alternatives, based on the USACE's authority provided in Section 205 of the Flood Control Act of 1948. The alternatives include, the "No Action" with the other two alternatives being formulated as structural and non-structural detention structures, located in Gallatin's Triple Creek Park with potential impacts to two un-named streams. The detention structures are designed to hold flood water that incorporates a time-release downstream. USACE may want to consider how the detention structures could impact the migration of terrestrial aquatic species. The USACE may also want to collaborate with the Tennessee Wildlife Resource Agency (TWRA) to determine any potential impacts to terrestrial aquatic species.

Although not physically required for USACE Civil Works projects, the Nashville District may want to provide the CWA 404(b)(1) documents for this project in the appendix in support of any wetland and stream mitigation decisions and to help Tennessee Department of Environmental Conservation (TDEC) to evaluate stream impact requirements for the TDEC Section 401 Water Quality permit.

Thank you for the opportunity to provide comments for your proposed project. In the event that the project rises above the feasibility study and to the level of an EA or EIS along with a need to engage our review process, the EPA Region 4 requests two hard copies of the draft documents with one electronic version, (i.e., CD/DVD). Please forward all hard/ electronic copies to:

Environmental Protection Agency - Region 4

Sam Nunn Atlanta Federal Center

Attn: NEPA Program Office

61 Forsyth Street, SW

Atlanta, GA 30303

Attn: Chris Militscher, NPO Chief

If you have any question, feel free to contact me via the information provided below.

Larry Long

Physical Scientist/Sr. Principle Reviewer
Resource Conservation & Restoration Division
EPA Region 4 NEPA Program Office
61 Forsyth Street, SW
Atlanta, GA 30303
404-562-9460

404-562-9598(FAX)

long.larry@epa.gov

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From: [Dustin Boles](#)
To: [LRN Planning Public Communication](#)
Cc: [Robbie Sykes](#)
Subject: [Non-DoD Source] 2017-CPA-0761 USACE - Flood Risk Mgt. Feasibility Study in Gallatin, TN - NEPA Scoping
Date: Monday, August 14, 2017 7:13:43 AM
Attachments: [2017-CPA-0761 Corps - Flood Risk Management Feasibility Study, Gallatin, Tn - NEPA Scoping Letter.pdf](#)

Mr. Carrington,

Please see the attached letter which serves as the U.S. Fish and Wildlife Service's comments concerning federally threatened and endangered species that are known to occur within the project action area. Please feel free to contact me if you have any questions regarding this information. We appreciate the opportunity to comment on the proposed action.

Sincerely,

Dustin W. Boles

Fish and Wildlife Biologist

U.S. Fish and Wildlife Service

Ecological Services

446 Neal Street

Cookeville, Tennessee 38501

931-525-4984

Email: dustin_boles@fws.gov <mailto:dustin_boles@fws.gov>

NOTE: This email correspondence and any attachments to and from this sender are subject to the Freedom of Information Act (FOIA) and may be disclosed to third parties



United States Department of the Interior



FISH AND WILDLIFE SERVICE
Tennessee ES Office
446 Neal Street
Cookeville, Tennessee 38501

August 11, 2017

Craig D. Carrington
Chief, Project Planning Branch
U.S. Army Corps of Engineers
Nashville District
110 9th Avenue South, Room A-405
Nashville, Tennessee 37203

Subject: FWS# 2017-CPA-0761. U.S. Army Corps of Engineers – Preparation of a Feasibility Study and Environmental Assessment to Assess Impacts of Proposed Flood Risk Management Measures in Gallatin, Sumner County, Tennessee.

Dear Mr. Carrington,

Thank you for your correspondence dated August 10, 2017, regarding the preparation of a Feasibility Study and Environmental Assessment to assess the impacts of proposed flood risk management measures for the City of Gallatin, Sumner County, Tennessee. There are three (3) action alternatives that would be analyzed which would include detention structures designed to hold flood waters and slowly release discharge downstream, likely reducing occurrences of flooding events. The detention structures would be located in the East Camp Creek watershed, which lies in the southeastern part of Sumner County, and covers a total of 46.2 square miles. U.S. Fish and Wildlife Service (Service) personnel have reviewed the submitted information and offer the following comments.

Our database does not indicate any known records of federally listed species occurring within the East Camp Creek watershed. However, the project would occur within the summer range of the federally endangered Indiana bat (*Myotis sodalis*) and federally threatened northern long-eared bat (*Myotis septentrionalis*). The Service recommends that the U.S. Army Corps of Engineers consider potential affects to these listed species during this review. Habitat that is suitable for use by these species includes trees, snags, and similar structures. Trees that are five (5) inches diameter at breast height are considered adequate size. The structure must have exfoliating bark, crevices, or other characteristics that would be considered suitable by a person with sufficient experience to provide adequate shelter for one or more bats. We recommend that disturbance of the suitable roosting habitat be avoided and minimized to the greatest extent possible.

Thank you for the opportunity to comment on this proposed action. If you have any questions regarding the information which we have provided, please contact Dustin Boles of my staff at 931/525-4984, or by email at *dustin_boles@fws.gov*.

Sincerely,



Mary E. Jennings
Field Supervisor

From: [Matthew K. Taylor](#)
To: [LRN Planning Public Communication](#)
Cc: [Wiley, Travis A CIV USARMY CELRN \(US\)](#); [Kendra Abkowitz](#); [Christina Guidry](#)
Subject: [Non-DoD Source] Comments on USACE Feasibility Study and Environmental Assessment to Assess FRM for Gallatin
Date: Friday, August 25, 2017 2:24:04 PM
Attachments: [image001.png](#)
[2017-8-25--USACE Gallatin Flood Mitigation Report.pdf](#)
[2017-8-25--USACE Gallatin Flood Mitigation.docx](#)

USACE Project Planning Branch,

The Tennessee Department of Environment and Conservation (TDEC) Office of Policy and Planning (POL) has reviewed the U.S. Army Corps of Engineers, Nashville District request for scoping comments regarding potential environmental or socioeconomic issues associated with a Feasibility Study and Environmental Assessment (EA) to assess the impacts of proposed flood risk management (FRM) measures for the City of Gallatin. POL used EJSCREEN to perform a preliminary screening of demographic information within a one-mile radius of Triple Creek Park. Please see the attached documents (“2017-8-25--USACE Gallatin Flood Mitigation Report.pdf” and “2017-8-25--USACE Gallatin Flood Mitigation.docx”) for more information regarding TDEC’s approach to environmental justice, EJSCREEN (and its limitations), and the EJSCREEN outputs associated with TDEC’s screen of Triple Creek Park.

TDEC protects and promotes human health and safety throughout the state by operating a responsible regulatory system to protect and improve Tennessee’s air, land, and water. TDEC is willing to engage in conversations with communities concerned about the protection of the state’s natural resources and the impact that the quality of these resources may have on communities.

If you have any questions please do not hesitate to contact me.

Thank you,

Matt Taylor | Policy Analyst

Office of Policy and Planning, TDEC

William R. Snodgrass Tennessee Tower

312 Rosa L Parks Ave, 2nd Floor

Nashville, TN 37243

Email: Matthew.K.Taylor@tn.gov <<mailto:Matthew.K.Taylor@tn.gov>>

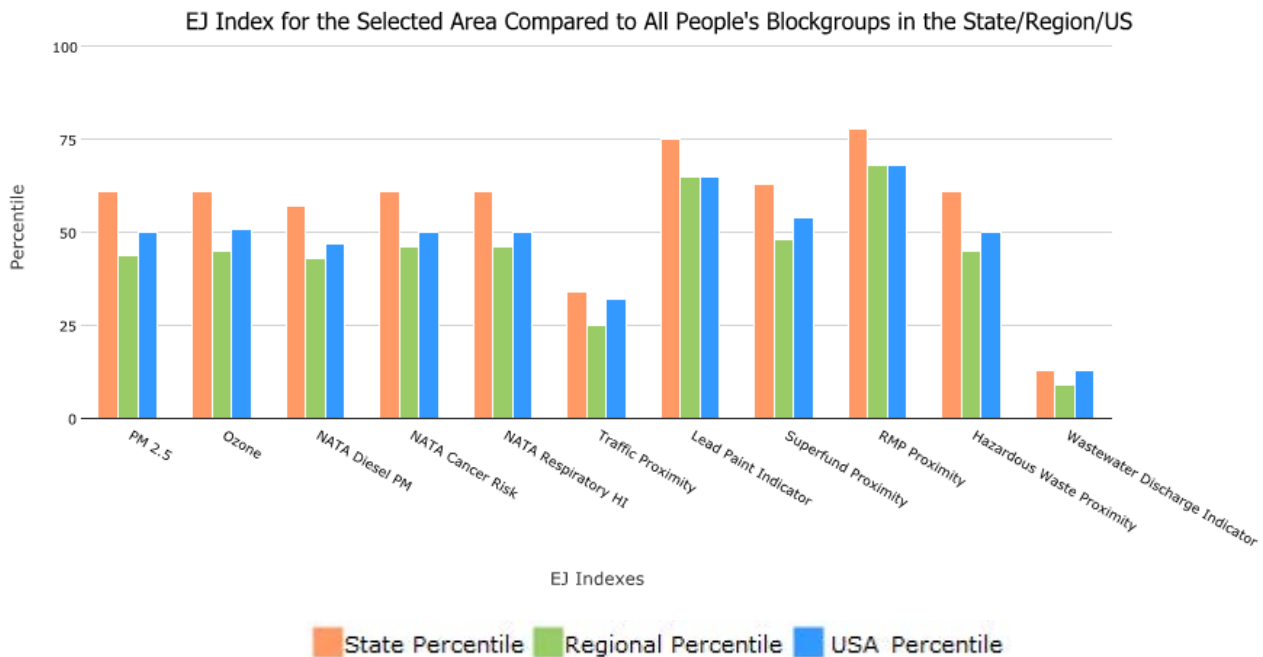
Office: 615-532-1291

Cell: 615-979-2449

Internal Customers: We value your feedback! Please complete our customer satisfaction survey
<Blockedhttps://stateoftennessee.formstack.com/forms/internal_cs> .

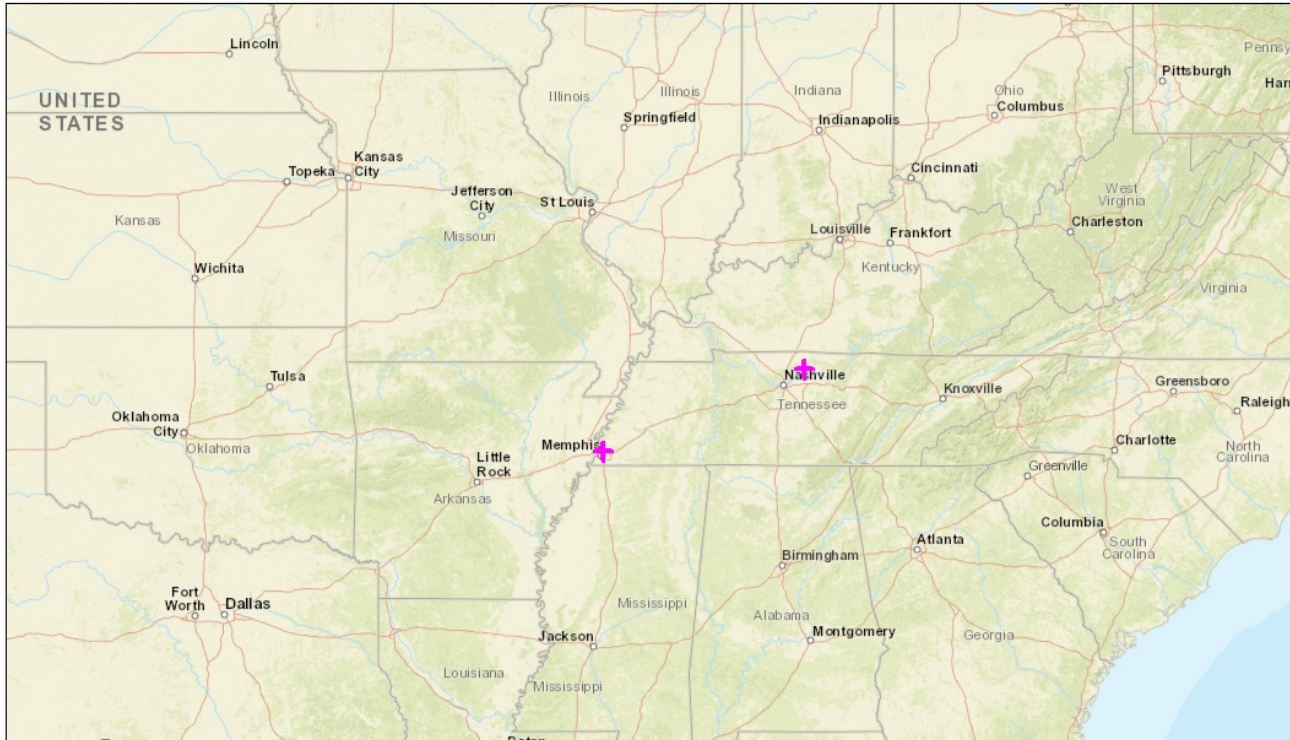
External Customers: We value your feedback! Please complete our customer satisfaction survey
<Blockedhttps://stateoftennessee.formstack.com/forms/tdec_customer_svs> .

Selected Variables	State Percentile	EPA Region Percentile	USA Percentile
EJ Indexes			
EJ Index for PM2.5			
EJ Index for Ozone			
EJ Index for NATA* Diesel PM			
EJ Index for NATA* Air Toxics Cancer Risk			
EJ Index for NATA* Respiratory Hazard Index			
EJ Index for Traffic Proximity and Volume			
EJ Index for Lead Paint Indicator			
EJ Index for Superfund Proximity			
EJ Index for RMP Proximity			
EJ Index for Hazardous Waste Proximity			
EJ Index for Wastewater Discharge Indicator			



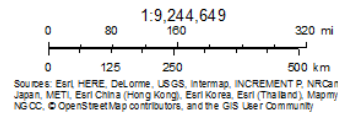
This report shows the values for environmental and demographic indicators and EJSCREEN indexes. It shows environmental and demographic raw data (e.g., the estimated concentration of ozone in the air), and also shows what percentile each raw data value represents. These percentiles provide perspective on how the selected block group or buffer area compares to the entire state, EPA region, or nation. For example, if a given location is at the 95th percentile nationwide, this means that only 5 percent of the US population has a higher block group value than the average person in the location being analyzed. The years for which the data are available, and the methods used, vary across these indicators. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports.

EJSCREEN Report (Version 2017)



August 22, 2017

✚ Digitized Point



Sites reporting to EPA	
Superfund NPL	
Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDF)	

Selected Variables	Value	State Avg.	%ile in State	EPA Region Avg.	%ile in EPA Region	USA Avg.	%ile in USA
Environmental Indicators							
Particulate Matter (PM 2.5 in $\mu\text{g}/\text{m}^3$)							
Ozone (ppb)							
NATA* Diesel PM ($\mu\text{g}/\text{m}^3$)							
NATA* Cancer Risk (lifetime risk per million)							
NATA* Respiratory Hazard Index							
Traffic Proximity and Volume (daily traffic count/distance to road)							
Lead Paint Indicator (% Pre-1960 Housing)							
Superfund Proximity (site count/km distance)							
RMP Proximity (facility count/km distance)							
Hazardous Waste Proximity (facility count/km distance)							
Wastewater Discharge Indicator (toxicity-weighted concentration/m distance)							
Demographic Indicators							
Demographic Index							
Minority Population							
Low Income Population							
Linguistically Isolated Population							
Population With Less Than High School Education							
Population Under 5 years of age							
Population over 64 years of age							

* The National-Scale Air Toxics Assessment (NATA) is EPA's ongoing, comprehensive evaluation of air toxics in the United States. EPA developed the NATA to prioritize air toxics, emission sources, and locations of interest for further study. It is important to remember that NATA provides broad estimates of health risks over geographic areas of the country, not definitive risks to specific individuals or locations. More information on the NATA analysis can be found at: <https://www.epa.gov/national-air-toxics-assessment>.

For additional information, see: www.epa.gov/environmentaljustice

EJSCREEN is a screening tool for pre-decisional use only. It can help identify areas that may warrant additional consideration, analysis, or outreach. It does not provide a basis for decision-making, but it may help identify potential areas of EJ concern. Users should keep in mind that screening tools are subject to substantial uncertainty in their demographic and environmental data, particularly when looking at small geographic areas. Important caveats and uncertainties apply to this screening-level information, so it is essential to understand the limitations on appropriate interpretations and applications of these indicators. Please see EJSCREEN documentation for discussion of these issues before using reports. This screening tool does not provide data on every environmental impact and demographic factor that may be relevant to a particular location. EJSCREEN outputs should be supplemented with additional information and local knowledge before taking any action to address potential EJ concerns.

Environmental Justice and U.S. Army Corps of Engineers Feasibility Study and Environmental Assessment of Proposed Flood Risk Management Measures for Triple Creek Park in the City of Gallatin, Sumner County, Tennessee

Tennessee Department of Environment and Conservation

What is environmental justice?

Environmental justice has been defined by the U.S. Environmental Protection Agency (EPA) as the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies.¹ The federal laws and statutes that EPA is responsible for implementing provide EPA the authority to consider and address environmental justice in actions including: setting standards; permitting facilities; making grants; issuing licenses or regulations; and reviewing proposed actions of other federal agencies.

What is the Tennessee Department of Environment and Conservation’s (TDEC) approach to environmental justice?

At this time, Tennessee does not have an EO or specific language within rule or statute that requires and/or provides TDEC the explicit authority to consider environmental justice within environmental regulatory program actions. However, striving for the equal treatment of all communities in administering environmental regulatory programs is a priority of the department. TDEC takes a collaborative approach to environmental justice by working with communities to ensure that historically underserved low-income and minority communities are afforded equal access to its programs and services and provided adequate opportunities for meaningful involvement with respect to the development, implementation and enforcement of environmental laws, regulations and policies. Public hearings held prior to the issuance of proposed permits are examples of mechanisms to ensure equity with regard to administration of environmental regulatory programs. Further, TDEC employs an Environmental Justice Manager who serves as a department and community resource for facilitating conversations regarding environmental justice issues and concerns as they relate to TDEC program responsibilities.

¹ Executive Order (EO) 12898, “Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,” was issued by President Bill Clinton on February 6, 1994. Its purpose is to focus federal attention on the environmental and human health effects of federal actions on minority and low-income populations with the goal of achieving environmental protection for all communities. The EO directs federal agencies to identify and address the disproportionately high and adverse human health or environmental effects of their actions on minority and low-income populations, to the greatest extent practicable and permitted by law. The order also directs each federal agency to develop a strategy for implementing environmental justice. The ultimate aim of the order is to promote nondiscrimination in federal programs that affect human health and the environment, as well as provide minority and low-income communities access to public information and public participation.

Given that proposed actions are still in early planning stages, it is not yet clear to TDEC what environmental regulatory role it may play in project design, construction, and implementation.

What is EJSCREEN?²

EJSCREEN is an environmental justice mapping and screening tool designed by the EPA, which utilizes standard and nationally available data to highlight locations that may have higher environmental burdens and more vulnerable populations than the state or national average. The tool provides both summary and detailed information at a high geographic resolution for demographic and environmental indicators. TDEC utilizes EJSCREEN as a preliminary screening tool to determine, in site specific instances, whether additional community engagement may be advisable or important with respect to a proposed project.

What are the limitations of EJSCREEN?³

The EPA recommends using EJSCREEN as an initial step to highlight areas in which additional community engagement may be desirable from the perspective of environmental justice. According to the EPA, EJSCREEN results have significant limitations and are not intended or designed to provide a risk assessment. For example, EJSCREEN does not provide data on every environmental impact and demographic indicator that may be relevant to a particular location, and data may be several years old. Thus, TDEC does not solely rely on EJSCREEN outputs for decisions about potential environmental justice issues. EJSCREEN is subject to substantial uncertainty in demographic and environmental data, particularly when looking at small geographic areas like a census block group. Lastly, while the use of percentiles provides useful perspective by putting the 12 environmental indicators in common units, it simply means those two scores are equally common (or equally rare) in the United States. It does not mean the risks are equal or comparable.

Demographic Information for a one-mile radius of Triple Creek Park in City of Gallatin, Tennessee

Environmental justice concerns are specific to each community, and the U.S. Army Corps of Engineers (USACE) has expressed an interest in environmental and socioeconomic issues that should be considered in the context of proposed flood risk management (FRM) measures to be located in Triple Creek Park for the benefit of the City of Gallatin in Sumner County, Tennessee.⁴ According to USACE, Gallatin has experienced repeated flooding, including in 1926, 1975, 1978, and 2010. USACE is considering three action alternatives and a “no action” alternative, including a possible detention

² Information regarding EJSCREEN comes from the U.S. EPA “EJSCREEN Fact Sheet”

³ *Id.*

⁴ The USACE has determined that the location of the proposed FRM will be Triple Creek Park. Therefore, demographic information has been analyzed for areas within a one mile radius of that site.

structure near the entrance of the park at Highway 31E, increasing the elevation of Touchdown Drive to act as a detention structure, or a combination of those actions.

According to data from EPA's environmental justice mapping and screening tool, EJSCREEN:

- Minority households comprise fifteen percent (15%) of the population within a one mile radius of Triple Creek Park, which is below the average percentage of minority households for the entire state, twenty-five percent (25%), and below the average percentage of minority households for the entire United States, thirty-eight percent (38%).
- Within a one mile radius of Triple Creek Park, thirty-four percent (34%) of households meet the federal government's classification of low-income which is defined as households earning less than twice the federal poverty line. Across the State of Tennessee, low-income households constitute thirty-nine percent (39%) of households. On a national level, across the country, low-income households make up thirty-four percent (34%) of the nation's households.
- Linguistically isolated individuals comprise zero percent (0%) of the population within a one mile radius of Triple Creek Park, which is below the state average of two percent (2%) and the national average of five percent (5%).
- Within a one mile radius of Triple Creek Park, twelve percent (12%) of individuals have less than a high school education, which is slightly lower than the state average of fifteen percent (15%) and national average of thirteen percent (13%).
- Within a one mile radius of Triple Creek Park, individuals over the age of 64 years of age represent twenty percent (20%) of the population, which is higher than the state average of fifteen percent (15%) and the national average of fourteen percent (14%).

Based on datasets utilized in the EJSCREEN tool, the demographic profile of the community immediately surrounding the potential project location, on average, exhibits fewer minority households than average across the state of Tennessee; exhibits slightly fewer than average low-income households than the profile of Tennessee as a whole; exhibits fewer linguistically isolated households than the state average; exhibits a slightly more educated population than the state average; and exhibits a greater number of individuals over the age of 64 than average across the state.

TDEC protects and promotes human health and safety throughout the state by operating a responsible regulatory system to protect and improve Tennessee's air, land, and water. TDEC is willing to engage in conversations with communities concerned about the protection of the state's natural resources and the impact that the quality of these resources may have on communities.



STATE OF TENNESSEE
DEPARTMENT OF ENVIRONMENT AND CONSERVATION
DIVISION OF WATER RESOURCES

William R. Snodgrass - Tennessee Tower
312 Rosa L. Parks Avenue, 11th Floor
Nashville, Tennessee 37243-1102

August 28, 2017

Mr. Craig T. Harrington
Chief, Project Planning Branch
Nashville District, Corps of Engineers
110 9th Avenue South, Room A-405
Nashville, TN 37203

RE: Comments on the proposed Gallatin Flood Risk Management Measures

Dear Mr. Harrington:

Thank you for contacting the Division of Water Resources for comments regarding the proposed Gallatin Flood Risk Management Measures. The project would be in the East Camp Creek Watershed in southeastern Sumner County and all of the action alternatives involve detention structures in Gallatin's Triple Creek Park on two unnamed tributaries of Town Creek. In general TDEC prefers non-structural alternatives such as removal of flood-prone structures from the floodplain, and robust municipal stormwater management policies and ordinances, over structural alterations to state waters. Structural alternatives that involve creating instream detention structures may result in a significant impact to water resources. Other designs may result in significant loss of water resources and require compensatory mitigation to result in no net loss.

Any increase in channel capacity should prioritize increasing floodplain storage at elevations above the ordinary high water mark, leaving a much naturally-sized, baseflow channel intact as possible. Off-line detention measures should be vigorously explored, and any instream detention may require compensatory mitigation to result in no net loss to state waters. Depending on the size of the two detention structures, they may qualify as dams and need construction certificates from the Safe Dams program. If the structures will impound over 15 acre feet or are 6 feet or more in height they will be classified as dams. From looking at the topographic map, it does appear that the two tributaries may be classified as wet weather conveyances, which may have some bearing on the requirements. I would encourage further discussion with Jimmy Smith, manager of the Division's Natural Resources Unit, at jimmy.r.smith@tn.gov or 615-532- 0468 regarding an Aquatic Resources Alteration Permit (ARAP) and a Dam Safety Certificate.

August 28, 2017
Mr. Craig T. Harrington
letter
page 2

Thank you again for your consideration in this matter. If you need further clarification, I will be glad to try to assist you. You may reach me at (615) 532-0170 or tom.moss@tn.gov.

Sincerely,

A handwritten signature in blue ink that reads "Thomas A. Moss". The signature is written in a cursive style.

Thomas A. Moss
Environmental Review Coordinator
Information Management Unit

cc: Matthew K. Taylor, TDEC Policy Office

C. CLEAN WATER ACT 404 (B)(1) ANALYSIS

**Continuing Authorities Program, Section 205
404 (b) (1) Evaluation
Flood Risk Management
East Camp Creek Watershed, Gallatin, Tennessee
Sumner County**

Project Description.

Location

The City of Gallatin is located in Middle Tennessee in Sumner County. The city lies 25 miles north of Nashville. The population of the City of Gallatin in 2013 was 32,307. The East Camp Creek watershed lies in the southeastern part of Sumner County covering a total of 46.2 square miles in USGS Hydrologic Unit Code (HUC) 05130201. The City of Gallatin is located on Town Creek. East Camp Creek is a tributary of the Cumberland River (Old Hickory Reservoir) at Mile 236.6.

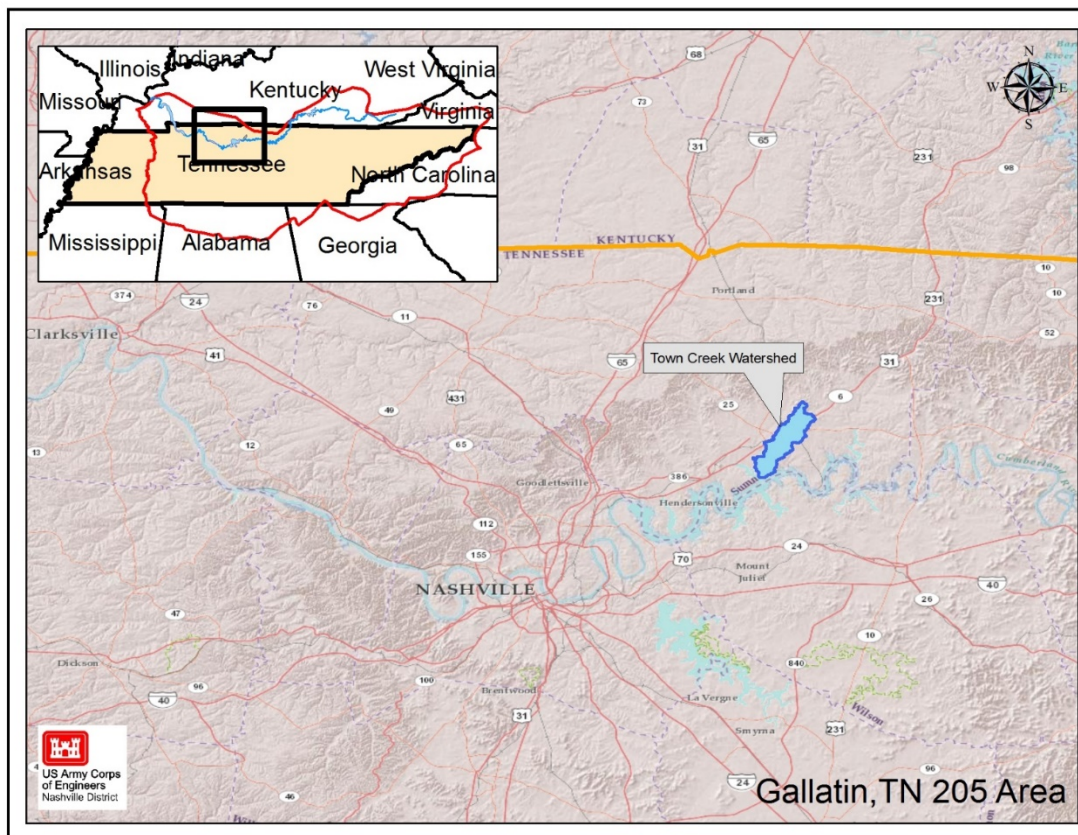


Figure 1. Town Creek Watershed

Authority

Section 205 of Flood Control Act of 1948, as amended - Flood Control. Projects implemented under this authority are formulated for structural or non-structural measures for flood damage reduction in accordance with current policies and procedures governing projects of the same type which are specifically authorized by Congress.

Study Partners and Coordination

City of Gallatin is the study sponsor. Cost sharing funds are provided by the City of Gallatin. The City of Gallatin requested assistance to reduce future flood damages in the East Camp Creek Watershed, USGS HUC 05130201, through a Letter of Intent (LOI). The initial LOI was received from Mayor Graves of the City of Gallatin on August 19, 2010. An additional LOI, reconfirming the city's interest in project participation, was received from Mayor Brown on April 16, 2015. A site visit was performed in April 2015. Representatives from the City of Gallatin were present as well as Nashville District (LRN) Environmental, Water Resources, Economics and Plan Formulation project delivery team (PDT) members. All major sites were visited and flooding problems were discussed with local officials. Historic photographic evidence, scour and documentation demonstrate the history of flooding.

Purpose and Scope

The East Camp Creek basin has a long history of flood damages. Flooding occurred in 1926, 1975, 1978, and 2010. Less widespread, more localized flooding also occurs throughout the basin at greater frequencies. Flooding can be the result of widespread major rain events or small intense storms and thunderstorms.

Flooding occurs throughout the East Camp Creek basin with the major damage centers being on Town Creek, East Camp's major tributary. There are also several homes on East Camp Creek that lie in the floodplain. The largest damage center, the one of most concern to the City of Gallatin, Tennessee, is the downtown area. Town Creek, a tributary of East Camp Creek, flows through the City of Gallatin along Highway 31E. The City of Gallatin study would focus on East Camp, Town, Town Trib 1 and Trib 2 Creeks (two lesser unnamed tributaries).

General Description of Dredged or Fill Material.

General Characteristics of Material.

Entrance Detention

The Entrance Structure at Triple Creek Park would be constructed to function as a "dry" detention structure. The top of the soil detention structure is to be constructed to EL. 562' along the entire length. The structure would tie into existing ground at EL. 562' on the east and west extremities of the planned construction. The proposed structure is approximately 800' in length and vary in height from 0' – 10' measured vertically from base to crest. The width of the structure would be 10' at the top of the structure. The design width at the base varies between 10' – 50' depending

on the height of the structure at any given point along the length. An additional 15' vegetation clear zone would be established and maintained along each side of the detention structure. The entire structure would be armored to prevent erosion and ensure structural integrity during overtopping events. The upstream and downstream sides of the structure are designed to be constructed at 2H:1V slope to ensure structural slope stability and accommodate the placement and retention of sufficient armor stone. The structure is designed to pass water at a restricted opening in the existing creek channel that runs north to south through the off-center of the planned detention basin. The design opening consist of two 8' x 8' precast concrete culverts situated side by side over the existing stream channel to provide outlet control of the detained storm water.



Action

Two 8' x 8' precast concrete culverts situated side by side over the existing stream channel. Clearing and grubbing of the existing riparian vegetation will be required for up to 70 linear feet.

Material: Wood, concrete, grout, steel, stone, sandbags, plastic, and construction equipment. The concrete culvert, grout sealant, and steel rebar and dowels would remain after construction. Wood used for forming concrete and any stone placed for temporary access roads will be removed upon completion of construction. Materials for the cofferdam (sandbags, plastic, and pump) would be deconstructed, removed and presumably re-used. Unsuitable soils for abutment excavation, organic material and other debris would be appropriately disposed of in accordance with applicable laws and regulations. Recycling of materials would be encouraged. Clean material (e.g., lean clay soil and sound rock) may be reused as appropriate during project construction or offsite when consistent with applicable environmental regulations. It is anticipated that the culvert will be constructed using land-based construction equipment.

Equipment would work from the embankment for culvert installation. The use of hand tools and equipment will be necessary to prepare the foundation and install the culvert system in the stream bedrock. The use of a vehicle mounted pneumatic hammer may be necessary for the removal of stone in the streambed. The use of motorized and hand operated compaction equipment is anticipated for proper compaction of the backfill material at abutments. All material would be obtained from an approved location.

Description of the Proposed Discharge Sites.

Location

See Project Location above.

Size.

The proposed culverts and section of berm crossing Town Creek would occur along approximately 70 LF section of Town Creek.

Type of Site

Stream and Riparian Area

Type of Habitat

Aquatic Habitat

In general, the stream was incised between 3-6 feet with very little access to the adjacent floodplain, except during flood events. The stream transitioned from the channel directly to uplands likely due to past channelization/grading and the resulting stream incision. Town Creek showed steady flow throughout the study reach and appeared to be a perennial stream. Substrate consisted primarily of bedrock with some reaches collecting cobble and small boulders on top of the bedrock.

Terrestrial Habitat

Riparian corridors (vegetated zone immediately adjacent to the stream) were narrow, dominated in the understory by common privet (*Ligustrum vulgare*) and bush honeysuckle (*Lonicera maackii*). Other species found within the riparian zone are Hackberry (*Celtis occidentalis*), American elm (*Ulmus americana*), Green Ash (*Fraxinus pennsylvanica*), Box elder (*Acer negundo*), Cottonwood (*Populus deltoides*), Red cedar (*Juniperus virginiana*), Black Cherry (*Prunus serotina*), Chestnut oak (*Quercus montana*), Honey locust (*Gleditsia triacanthos*), Black walnut (*Juglans nigra*), Sassafras (*Sassafras albidum*), Osage orange (*Maclura pomifera*) Mulberry (*Morus rubra*), and Redbud (*Cercis canadensis*).

Timing and Duration of Discharge

Construction below OHW would be scheduled to coincide with low flow conditions and take place between the dates of July 1st through September 31st to reduce sedimentation impacts.

Description of Disposal Method.

A temporary cofferdam would be constructed just upstream of the planned culvert emplacement, most likely with sandbagging and use of a polyethylene liner. The flow would be pumped overland, to exit downstream of the construction area until the culvert is operational. The dewatering operation is anticipated to continue several days to several weeks. The stream banks and abutment areas would need to be cleared of vegetation (two 50'x75' areas) on each side of the culvert emplacement area. Some degree of excavation of in situ soil is anticipated along the creek bank on each side of the culvert emplacement location to ensure adequate space for placement and proper backfill along the abutments of the culvert system. The culvert system will be two 8'x8' precast concrete box culverts placed in parallel in the stream. The culvert will have upstream and downstream wing walls, and given the evidence of sound rock constituting the natural streambed - the inclusion of an invert slab is not anticipated. The concrete footings should be keyed in and grouted and/or doweled into rock based on future sampling/boring/coring analysis of the existing geology. The precast culvert system would be off-loaded from an overland transport trailer with use of a land based crane and emplaced in the existing streambed to align with the prepared culvert foundation. The abutments would be backfilled with lean clay and properly compacted.

Sound environmental and engineering practices commonly referred to as Best Management Practices (BMPs) would be followed during all phases of project construction. The Corps would remove and dispose of excavated material in accordance with local ordinances.

Factual Determinations.

Physical Substrate Determinations.

Riparian vegetation removal would take place along approximately 70 LF of stream bank (both right and left banks) to prepare for the culverts placement and construction of the berm. The two concrete culverts would be placed over the stream for approximately 65 LF. Culverts would be designed with an open bottom in order to maintain a natural stream substrate.

Storage Volume.

N/A

Water Column

Removal small amounts of substrate to prepare site for riprapping may cause minor localized and short-term increases in turbidity and suspended solids.

Sediment Type

Sediments resulting from erosion along river banks transported by water flow are composed of sorted sand, silt, and other fine materials.

Dredged/Fill Material Movement

Stream bank site preparation would result in de minimis discharge of material into Town Creek. Construction during low flow conditions would reduce movement of sediment. In-stream work will also minimize incidental fallback of material into the water. Construction Best Management Practices (BMPs) will minimize material from reentering the water.

(1) Actions Taken to Minimize Impacts.

- Construction BMPs would be implemented to minimize impacts to the riparian zone and riverbed. BMPs, such as silt fencing, riprap, filter cloth, check dams, would also help control erosion and resuspension of soil and sediments.
- The river banks would be stabilized and vegetation would be reestablished where appropriate to reduce any potential bank erosion.

b. Water Circulation, Fluctuation, and Salinity Determinations. Water chemistry, odor, taste, dissolved oxygen levels, nutrients, and eutrophication would not be significantly affected by the operations. Any minor effects would stabilize to preconstruction ranges quickly when construction activities were complete.

(1) Water.

- (a) Salinity. Water salinity not applicable.
- (b) Water Chemistry. The proposed project should not have any effects.
- (c) Clarity. The proposed project could cause periodic increases in total solids and total suspended solids during and for a short period after site preparation and during culvert placement. A decrease in water clarity would be expected during culvert placement and berm construction. Once construction is complete, there should be localized improvements from current conditions due to significant reduction in sediments entering the water along the project area.
- (d) Color. No significant impact is expected.
- (e) Odor. No significant impact is expected.
- (f) Taste. No significant impact is expected.

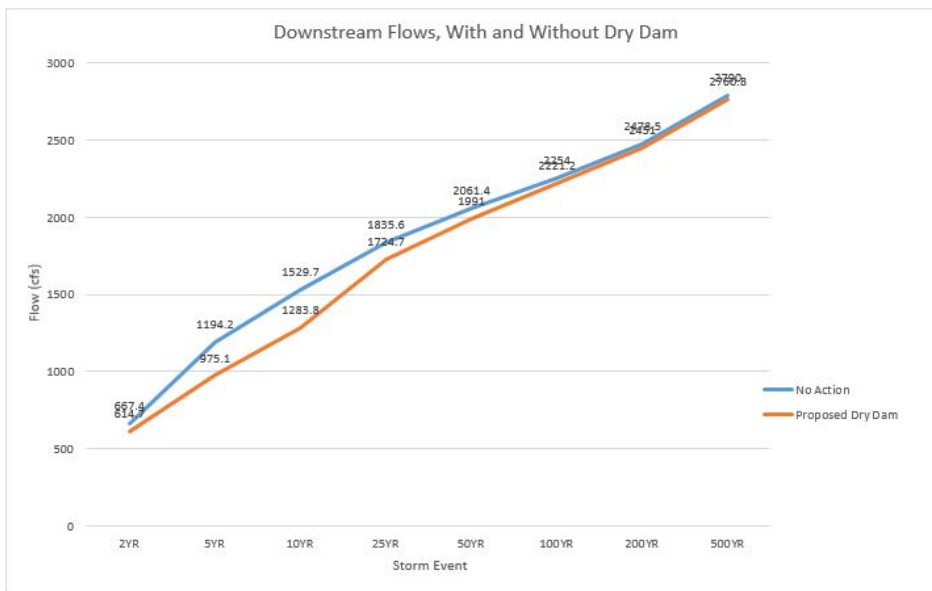
(g) Nutrients. The proposed action could cause temporary nutrient increases during periods of resuspension of sediment and organic debris.

(h) Eutrophication. No significant impacts are anticipated.

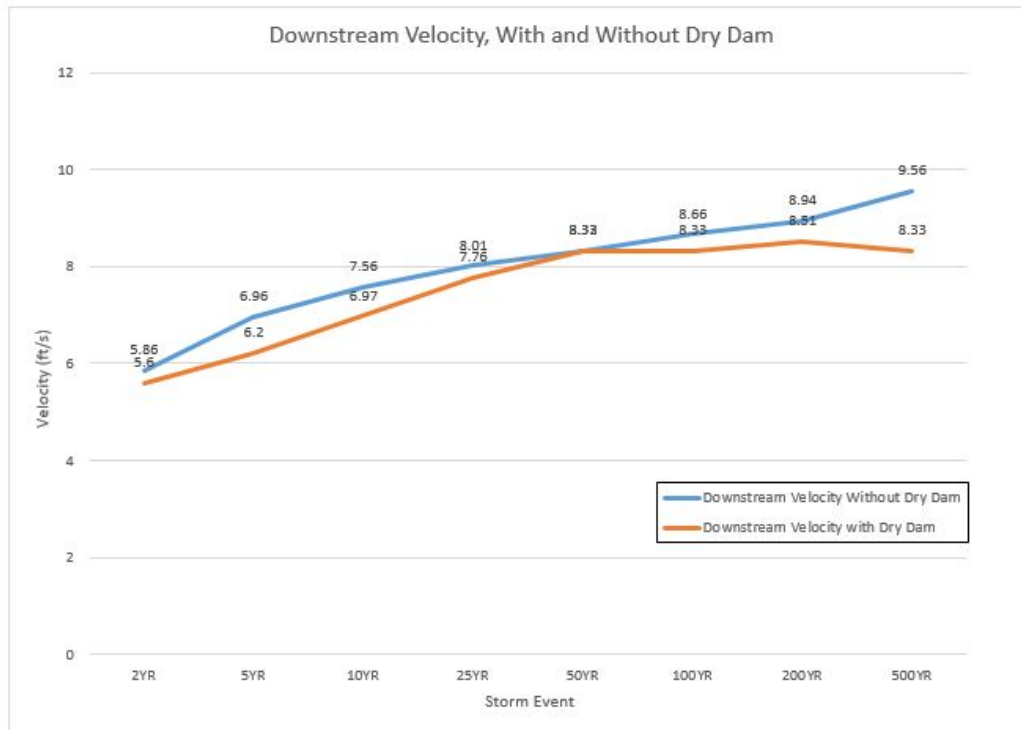
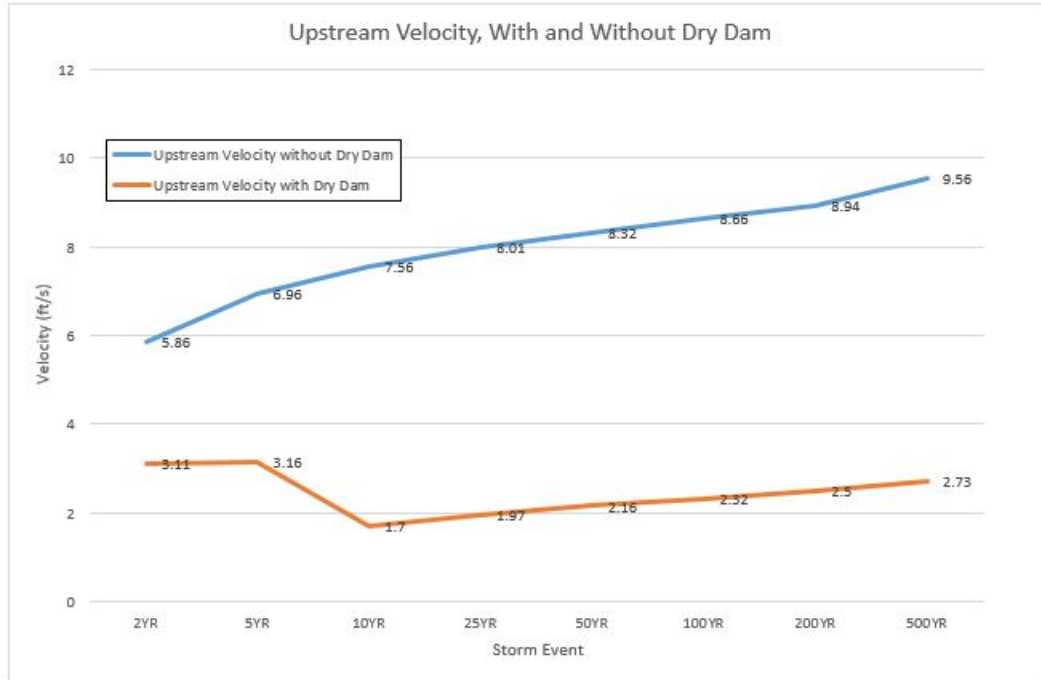
(2) Current Patterns and Circulation.

No significant Effects

(a) Current Patterns and Flow. Town Creek there would be a minor amount of flow change downstream of the structure (see below figure). flow patterns would not be significantly change within the project area.



(b) Velocity. The proposed project would reduce velocities upstream of the culverts by up to 70% depending upon flow conditions. Velocities downstream of the culverts would see very little change in velocities. No significant effects should occur under normal and low flow conditions (2 year event and less).



(c) Stratification. No changes in water stratification anticipated.

(d) Hydrologic Regime. No significant impact is expected.

(3) Normal Water Fluctuations. The proposed action should not change the normal river stages (2 year event and less).

(4) Salinity Gradients. Not applicable

(5) Actions That Will Be Taken to Minimize Impacts.

- Only the minimum amount of vegetation will be cleared for culvert placement and berm construction
- Culvert placement and berm construction in the channel would be limited to low flow conditions to minimize overall impacts of sediment disturbances.

c. Suspended Particulate/Turbidity Determinations.

(1) Expected Changes in Suspended Particulates and Turbidity Levels in Vicinity of Disposal Site. Placement of the culverts would potential result in short-term suspension of particulates. Since the substrate is primarily bedrock, there would be very minor amounts of particulates available to suspend. Adverse impacts would be limited to periods of construction and for a short period following activity. After construction, during high flow events, stream velocities would be substantially lowered, allowing particulates to settle out and redcuing downstream sedimentation.

(2) Effects on Chemical and Physical Properties of the Water Column. The proposed action would have no effect on chemical or physical properties of the water column.

(a) Light Penetration. Temporary increases in suspended sediment loads and turbidity would decrease light penetration through the water column, but impacts would be of short duration and have no longer term impacts.

(b) Dissolved Oxygen. No significant impact is expected.

(c) Aesthetics. Short-term construction impacts would be anticipated.

d. Contaminant Determinations. No contaminated materials would be released during construction of this project. Should contamination be found, necessary steps to avoid the materials or clean-up of the area would take place.

e. Aquatic Ecosystem and Organism Determinations.

(1) Effects on Plankton. The proposed action could cause some mortality because of increases in total suspended solids and turbidity and decreases in dissolved oxygen levels during construction periods. Impacts will be temporary and short-term in nature, and recolonization of the area by plankton should occur quickly after construction is complete.

(2) Effects on Benthos. Temporary effects on benthic macroinvertebrates would occur during construction.

(3) Effects on Nekton. No significant impacts are anticipated.

(4) Effects on Aquatic Food Web. No significant impacts are anticipated.

(5) Threatened and Endangered Species. Coordination with US Fish and Wildlife Service and Tennessee Wildlife Resources Agency revealed no threatened or endangered species are reported in the project area other than being in the range of the Indiana bat and Northern long-eared bat. Any tree clearing activities that would affect potential summer roosting habitat would be coordinated with the Service.

(6) Wildlife Habitat. The adjacent areas of Triple Creek Park are manicured turf grasses, recreational ball fields, parking lots, and ball fields. Wildlife use of the riparian is likely limited to common urban species due to the significant amount of disturbance.

g. Determination of Cumulative Effects on the Aquatic Ecosystem. The present state of the stream and adjacent riparian zone and floodplain results in degraded water quality from urban runoff, additional erosion and siltation, and continued deterioration of aquatic and terrestrial resources. The lowered velocities upstream of the culverts and berm would reduce the amount of sedimentation transfer downstream and would reduce flooding of structures downstream. Cumulative effects are also discussed in further detail in Section 4 of the EA.

h. Determination of Secondary Effects on the Aquatic Ecosystem. No significant impact is anticipated.

III. Findings of Compliance or Non-Compliance with Restrictions on Discharge.

a. Adaptation of the Section 404(b)(1) Guidelines to this Evaluation. No significant adaptations of the Section 404(b)(1) guidelines were made relative to this evaluation.

b. Evaluation of Availability of Practicable Alternatives to the Proposed Discharge Site Which Would Have Less Adverse Impact on the Aquatic Ecosystem. The objective of the proposed project is to reduce flood risk and improve the overall quality of life for the residents of the City of Gallatin. There were many alternatives evaluated in the USACE flood risk management feasibility study. The recommended detention alternative provides the greatest amount of net benefits. There are no known cultural, environmental or HTRW issues with the project site and the City of Gallatin supports the project. To lessen the impacts, construction BMPs will be implemented to limit impacts to aquatic ecosystem.

c. Compliance with Applicable State Water Quality Standards Compliance with Tennessee water quality standards would be maintained and monitored. Tennessee 401 Water Quality Certification covered under an individual permit and will be applied for and received prior to construction during the planning, engineering, and design phase of the project.

d. Compliance with Applicable Toxic Effluent Standard of Prohibition Under Section 307 of the Clean Water Act. Construction would not violate Section 307 of the Clean Water Act.

e. Compliance with the Endangered Species Act. US Fish and Wildlife Service (USFWS) stated in a letter, dated August 11, 2017, their database does not indicate any known records of federally listed species occurring within the East Camp Creek watershed. However, the project would occur within the summer range of the federally endangered Indiana bat (*Myotis sodalis*) and federally threatened northern long-eared bat (*Myotis septentrionalis*).

f. Compliance with Specified Protection Measures for Marine Sanctuaries Designated by the Marine Protection, Research, and Sanctuaries Act of 1972. Not applicable.

g. Evaluation of Extent of Degradation of the Waters of the United States.

(1) Significant Adverse Effects on Human Health and Welfare.

(a) Municipal and Private Water Supplies. The proposed action would not have any significant adverse effects to municipal or private water supplies.

(b) Recreation and Commercial Fisheries. The proposed action would not have any significant adverse effects to recreation or commercial fisheries.

(c) Benthic Organisms. Populations of benthic organisms would be impacted at the construction site, temporarily during construction. The proposed action would not have any significant adverse effects.

(d) Fisheries Resources. Impacts to fisheries resources are expected to be minimal. The proposed action would not have any significant adverse effects.

(e) Shellfish. No significant shellfish resources (mussels) of commercial value are found at the construction site. The proposed action would not have any significant adverse effects.

(f) Wildlife. The proposed action would not have any significant adverse effects.

(g) Special Aquatic Sites. No special aquatic sites are identified within the project area.

(2) Significant Adverse Effects on Life Stages of Aquatic Life and Other Wildlife Dependent on Aquatic Ecosystems. Life stages of aquatic and terrestrial species would not be adversely affected.

(3) Significant Adverse Effects on Aquatic Ecosystem Diversity, Productivity, and Stability. The proposed action would have no significantly adverse impacts on life stages of aquatic life and other wildlife dependent on aquatic ecosystems.

(4) Significant Adverse Effects on Recreational, Aesthetic, and Economic Values. The proposed action would not have any significant adverse effects.

h. Appropriate and Practicable Steps Taken to Minimize Potential Adverse Impacts of the discharge on the Aquatic Ecosystem.

- Best Management Practices would be implemented to minimize impacts to the riparian zone and the riverbed. BMPs would also help control erosion and re-suspension of soil and sediments
- Construction activities would be limited to low flow conditions to minimize the overall effects of sediment disturbance.
- Alterations of the river bank would be limited to the greatest extent possible.

i. On the Basis of EPA 404 (b) (1) Guidelines, the Proposed Disposal Site for the Discharge of Dredged or Fill Material is: in compliance with requirements of these guidelines, with the inclusion of appropriate conditions and construction BMPs to minimize impacts to the aquatic ecosystem.

D. UNSIGNED FONSI

U.S. ARMY CORPS OF ENGINEERS
NASHVILLE DISTRICT

FINDING OF NO SIGNIFICANT IMPACT

East Camp Creek Watershed
Section 205, Flood Risk Management
Sumner County, Tennessee

1. The U.S. Army Corps of Engineers, Nashville District has conducted an environmental analysis in accordance with the National Environmental Policy Act (NEPA) of 1969, 42 U.S.C. §§ 4321, *et seq.*, as amended. The Corps addressed the environmental effects of the recommended plan in the Final Detailed Project Report and Environmental Assessment (EA), dated _____, for the East Camp Creek Watershed, Section 205, Flood Risk Management Study, in Sumner County, Tennessee. The recommended plan includes an armored earthen detention structure that would store approximately 46 acre-feet of water near the entrance to Triple Creek Park. This EA was prepared pursuant to NEPA, Council for Environmental Quality (CEQ) regulations (40 C.F.R. pts. 1500–1508) and the Corps implementing regulation, Procedures for Implementing NEPA, ER 200-2-2 (4 March 1988) (codified at 33 C.F.R. pt. 230).
2. In addition to the "No Action" alternative, a wide variety of flood risk management measures were developed that would address one or more of the planning objectives. Only the Entrance Detention alternative and No Action were evaluated in detail. The recommended plan, (Entrance Detention), was ultimately determined to be the national economic development (NED) plan, which maximizes net annual benefits and provides significant residual risk reduction while being cost effective.
3. All practicable means to avoid and minimize adverse environmental effects have been incorporated into the recommended plan. Most of the environmental impacts are minimal. There would be a loss of some riparian vegetation (70 linear feet) under the recommended plan, in order to install two 8' x 8' concrete culverts and a berm perpendicular to Town Creek. Temporary erosion and sedimentation impacts from construction would occur; however, best management practices would lessen the impacts. Water velocities upstream of the structure will slow, which may lead to some sedimentation of the floodplain; however, the majority of the floodplain is developed as recreational facilities associated with Triple Creek Park. These areas will remain maintained in the future.
4. Coordination with U.S. Fish and Wildlife Service (Service) in accordance with the Fish and Wildlife Coordination Act, 16 U.S.C. §§ 661, *et seq.* and the Endangered Species Act, 16 U.S.C. §§ 1531, *et seq.*, was initiated by submittal of a scoping letter on August 10, 2017. In response,

the Service stated by letter that no federally protected species or critical habitat are known to occur in the study area; however, the Service noted that the project would occur within the summer range of the federally endangered Indiana bat and the federally threatened Northern long-ear bat. During a site visit on July 10, 2017, USACE biologists identified potential bat habitat. Approximately five snags exist in the direct vicinity of the proposed detention structure. The construction of this detention structure could require the removal of those snags. Any tree removal would be conducted during winter months to reduce potential negative impacts. Based on the timing of a proposed project (3–5 years before construction would begin), USACE would propose to conduct an additional habitat assessment after project designs were finalized. Additional correspondence would then be conducted with the Service. Based on the plan to cut any trees in the winter and ensure additional coordination with the Service in the future, USACE finds that the proposed action “may affect, but would not adversely affect” the Indiana bat and the Northern long-eared bat.

6. Section 106 of the National Historic Preservation Act of 1966 (NHPA), 54 U.S.C. §§ 300101, *et seq.*, as amended, and its implementing regulations at 36 C.F.R. part 800 require consideration of cultural resources prior to a federal undertaking and require consultation with the State Historic Preservation Officer (SHPO), federally recognized tribes with a connection to the project location, and other consulting parties defined in Section 800.3 of the regulations. The NHPA only affords protection to sites, buildings, structures, or objects listed in or determined eligible for listing in the National Register of Historic Places (NRHP). USACE initiated Section 106 consultation with the TN SHPO and six federally recognized Native American Tribes in August 2017. The SHPO and consulting parties that responded to USACE concurred with a “no historic properties affected” determination.

7. Impacts to streams and wetlands associated with flood control measures were evaluated for compliance with Section 404 of the Clean Water Act (CWA), 33 U.S.C. § 1344, administered by the Corps. Riparian vegetation would be removed for approximately 70 linear feet to install the culverts and berm. Placement of the culverts would potentially result in short-term suspension of particulates. Since the substrate is primarily bedrock, there would be very minor amounts of particulates available to suspend. Adverse impacts would be limited to periods of construction and for a short period following activity. After construction, during high flow events, stream velocities would be substantially lowered, allowing particulates to settle out and reducing downstream sedimentation. A CWA Section 404(b)(1) analysis was completed for the proposed action. The conclusion of this analysis was that the proposed discharge of fill material is in compliance with the requirements of the guidelines with the inclusion of appropriate conditions and construction BMPs to minimize impacts to the aquatic ecosystem. A Section 401 water quality permit from the State of Tennessee would be required. Also, there would be no significant adverse effects to aquatic resources and no required compensatory mitigation is currently anticipated.

8. I have reviewed the Final Detailed Project Report and EA for the East Camp Creek Watershed,

Section 205, Flood Risk Management Study in light of the general public interest. All applicable laws, executive orders, regulations, and local government plans were considered in the evaluation of the alternatives. I have determined that the recommended plan would not constitute a major Federal action significantly affecting the quality of the human environment within the meaning of the NEPA. Accordingly, I have concluded that preparation of an Environmental Impact Statement (EIS) will not be required.

DATE

Cullen A. Jones, P.E., PMP
Lieutenant Colonel, U.S. Army
District Commander

East Camp Creek Watershed Gallatin, Tennessee



US Army Corps
of Engineers
Nashville District

Section 205, Flood Risk Management

NHPA Section 106 Summary Appendix H



TABLE OF CONTENTS

List of Acronyms	iv
List of Tables	iv
1.0 Section 106 Summary	1

SHPO and Tribal Responses

LIST OF ACRONYMS

- NHPA - National Historic Preservation Act
- SHPO - State Historic Preservation Officer
- NEPA - National Environmental Policy Act
- NRHP - National Register of Historic Places
- NR - No Response
- THC - Tennessee Historic Commission

LIST OF TABLES

Table 1. Summary of Section 106 of NHPA Consultation 1

1.0 SECTION 106 SUMMARY

Section 106 of the National Historic Preservation Act of 1966, as amended (NHPA), and its implementing regulations at 36 CFR 800 require consideration of cultural resources prior to a federal undertaking and requires consultation with the State Historic Preservation Officer (SHPO), Federally recognized tribes with a connection to the project location and other consulting parties defined at §800.3. The NHPA only affords protection to sites, buildings structures, or objects listed in or determined eligible for listing in the National Register of Historic Places (NRHP). In addition, under the Archaeological Resources Protection Act and section 110 of the NHPA, the USACE has responsibilities to protect and preserve significant archaeological sites. Archival research for this project involved consulting the NRHP, and eliciting information from previous archaeological survey reports. Table 1 summarizes the parties consulted, the mechanisms for consultation, and responses to the consultation. The Section 106 consultation has led to a “no effects to historic properties” determination for the proposed project.

Table 1. Summary of Section 106 of NHPA Consultation

Consulting Party	Initiation date	Initiation Mechanism	No Effect Letter Sent	Concurrence to No Effect Determination
Tennessee State Historic Preservation Officer	11 August 2017	1,2	11 August 2017	25 August 2017
Absentee-Shawnee Tribe of Indians of Oklahoma	18 August 2017	1,2	18 August 2017	9 September 2017
Cherokee Nation	18 August 2017	1,2	18 August 2017	NR
Eastern Band of Cherokee Indians	18 August 2017	1,2	18 August 2017	NR
Eastern Shawnee Tribe of Oklahoma	18 August 2017	1,2	18 August 2017	NR
The Shawnee Tribe	18 August 2017	1,2	18 August 2017	28 August 2017
United Keetoowah Band of Cherokee	18 August 2017	1,2	18 August 2017	NR

1-Notified of project in NEPA scoping notices.

2-Section 106 initiation letter sent

*Response date reflects the end of the 30 day comment period. No Response (NR) implies concurrence with the USACE finding of “no historic properties affected” as per 36 CFR 800.4(d).

Consultation with the Tennessee Historical Commission (THC) was initiated via letter dated 11 August 2017 discussing the components of the flood reduction project and the findings of the cultural review. The Corps recommended a “no effects to historic properties” determination. The THC concurred with the Corps’ findings in a letter dated 25 August 2017. Therefore this action complies with Section 106 of the NHPA.

Consultation was initiated with six federally recognized Native American Tribes in letters dated 11 August 2017. These included: United Keetoowah Band of Cherokee Indians, Absentee-Shawnee Tribe of Indians of Oklahoma, Cherokee Nation, Eastern Band of Cherokee Indians, Eastern Shawnee Tribe of Oklahoma, and The Shawnee Tribe. The initiation letter discussed the components of the flood reduction project and the findings of the cultural review. The Corps recommended a “no effects to historic properties” determination. The Absentee-Shawnee Tribe of Indians of Oklahoma responded in a letter dated 9 September 2017, concurring with the Corps’ determination. The Shawnee Tribe of Indians of Oklahoma responded in a

letter dated 28 August 2017, concurring with the Corps' determination. Both tribes requested to be notified immediately upon the discovery of human remains funerary objects or archaeological artifacts and that all activities cease.

USACE did not receive any responses from the remaining five Native American tribes; United Keetoowah Band of Cherokee Indians, Cherokee Nation, Eastern Band of Cherokee Indians, and the Eastern Shawnee Tribe of Oklahoma. Pursuant to 36 CFR 800.4(d)(1)(i) no response from the tribes after the 30 day comment period, implies concurrence with the Corps' original findings and fulfills consultation requirements under Section 106 of the National Historic Preservation Act. This action is in compliance with the National Historic Preservation Act.



TENNESSEE HISTORICAL COMMISSION
STATE HISTORIC PRESERVATION OFFICE
2941 LEBANON PIKE
NASHVILLE, TENNESSEE 37243-0442
OFFICE: (615) 532-1550
www.tnhistoricalcommission.org

August 25, 2017

Mr. Craig D. Carrington
United States Army Corps of Engineers, Nashville District
110 9th Avenue South, Room A-405
Nashville, TN 37203

RE: COE-N / Nashville District/Corps of Engineers, Triple Creek Park Flood Reduction Project, Gallatin, Sumner County, TN

Dear Mr. Carrington:

In response to your request, we have reviewed the documents you submitted regarding your proposed undertaking. Our review of and comment on your proposed undertaking are among the requirements of Section 106 of the National Historic Preservation Act. This Act requires federal agencies or applicant for federal assistance to consult with the appropriate State Historic Preservation Office before they carry out their proposed undertakings. The Advisory Council on Historic Preservation has codified procedures for carrying out Section 106 review in 36 CFR 800 (Federal Register, December 12, 2000, 77698-77739).

After considering the documentation submitted, we concur with your agency that there are no National Register of Historic Places listed or eligible properties affected by this undertaking. We have made this determination because either: no National Register listed or eligible Historic Properties exist within the undertaking's area of potential effects, the specific location, size, scope and/or nature of the undertaking and its area of potential effects precluded affects to Historic Properties, the undertaking will not alter any characteristics of an identified eligible or listed Historic Property that qualify the property for listing in the National Register, or it will not alter an eligible Historic Property's location, setting or use. We have no objections to your proceeding with your undertaking.

If your agency proposes any modifications in current project plans or discovers any archaeological remains during the ground disturbance or construction phase, please contact this office to determine what further action, if any, will be necessary to comply with Section 106 of the National Historic Preservation Act. You may direct questions or comments to Jennifer M. Barnett (615) 687-4780. This office appreciates your cooperation.

Sincerely,

E. Patrick McIntyre, Jr.
Executive Director and
State Historic Preservation Officer

EPM/jmb



Absentee Shawnee Tribe of Oklahoma
Cultural/Tribal Historic Preservation Department
2025 S. Gordon Cooper Dr.
Shawnee, Oklahoma 74801
Phone: (405) 275-4030 ext 6340

9/13/17

RE: Gallatin Flood Reduction Study

To Whom It May Concern:

This response is regarding the request from your office for a review of the project listed above. We have reviewed the information provided in your letter of August 18, 2017. We find after review of this information that we concur with your findings of no adverse affects.

We remain interested in further communications regarding this project due to the location. The Shawnee people have a documented historical presence in Tennessee. While there are no documented village sites within the project site or within a close proximity outside the project site, there still remains the potential of finding unknown sites in and surrounding the project location.

It is further advised that if the area of potential effect changes or in the event of an inadvertent discovery of human remains or other cultural resources that we receive notification within 48 hours. As well, any advertent discovery of human remains or other cultural resources should remain in situ until consultation with interested tribes and agencies is undertaken.

Thank you for your time and patience in communications regarding section 106 and NAGPRA issues. We appreciate your continued efforts in such matters. Please do not hesitate to contact me at the information below if you have any questions or concerns.

Best Regards,

Erin Thompson
Tribal Historic Preservation Officer
Absentee Shawnee Tribe of Oklahoma
2025 Gordon Cooper Drive
Shawnee, OK 74801
(P) 405.275.4030 Ext. 6340
ethompson@atribe.com

Mcintyre, Jordan C CIV USARMY CELRN (US)

From: tonya@shawnee-tribe.com
Sent: Monday, August 28, 2017 10:36 AM
To: McIntyre, Jordan C CIV USARMY CELRN (US)
Subject: [EXTERNAL] East Camp Creek Basin located in the City of Gallatin, Summer County, Tennessee

This letter is in response to the above referenced project.

The Shawnee Tribe's Tribal Historic Preservation Department concurs that no known historic properties will be negatively impacted by this project.

We have no issues or concerns at this time, but in the event that archaeological materials are encountered during construction, use, or maintenance of this location, please re-notify us at that time as we would like to resume immediate consultation under such a circumstance.

If you have any questions, you may contact Second Chief Ben Barnes via email at ben.barnes@gmail.com <<mailto:ben.barnes@gmail.com>> or Roy Baldrige at ckrtstr@yahoo.com <<mailto:ckrtstr@yahoo.com>> .

Thank you for giving us the opportunity to comment on this project.

Sincerely,

Tonya Tipton

Shawnee Tribe