
Stormwater Master Plan Town of Nashville, Indiana

Prepared for:

Town of Nashville

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engineering

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EXECUTIVE SUMMARY

Introduction

The Stormwater Master Plan (Master Plan) outlines the Town of Nashville's (Town) stormwater improvement goals, analyzes project alternatives and priorities, and provides recommendations. Infrastructure improvements for the existing storm sewer system maintained by the Town of Nashville are needed to address ponding water and undersized or deteriorated stormwater infrastructure. Evaluation of the Town's stormwater utility is also included.

Project Summary

The Town of Nashville initially identified 3 potential priority areas that experience significant drainage issues due to aging and deteriorating infrastructure, undersized pipes, and poor pavement conditions. A town-wide field evaluation, that included the 3 priority areas, was completed. The field investigation included taking photos and notes of the drainage and pavement conditions. Due to the absence of accurate and usable GIS mapping information for the Town, the evaluation of existing stormwater infrastructure was facilitated using ESRI's ArcGIS Collector™ mobile application. This application was used to collect basic information, such as the location, physical characteristics, and condition, of the stormwater assets within the municipal limits of the Town. Based on input from the Town, field investigation, and an evaluation of the current GIS data collection, the initial priority areas and other locations within the Town were recommended for one or more of the following projects: GIS mapping updates, channel improvements, roadside drainage improvements, and proposed trunkline conveyance with stormwater infrastructure reconstruction.

Maintenance and inspection of the existing storm sewer system is recommended. A fiscal maintenance plan may be used to help determine future operating and capital project costs, fees, and stormwater utility rates. An audit of the billing system will allow the Town to ensure all new development and properties with impervious surface are being billed correctly.

Implementation Plan

The implementation plan provides a summary of cost per year to the stormwater utility for all necessary and recommended projects to be completed as funds become available. The plan combines the recommendations outlined in this report and compares to the stormwater utility budget in order to prioritize and schedule out future improvements.

1.0 INTRODUCTION

The Town of Nashville has retained DB Engineering, LLC (DB) to develop a Stormwater Master Plan (Master Plan). This Master Plan identifies and assesses stormwater management issues throughout the Town of Nashville. It summarizes potential improvement projects, evaluates current stormwater utility management, and serves as a comprehensive plan for Nashville's stormwater drainage system.

The Master Plan is intended to be a living document that should be reviewed and updated regularly, as projects are completed, and as new issues develop.

1.1 Study Area

The Town of Nashville, Indiana is located approximately 19 miles east of Bloomington, Indiana along State Road 46. More specifically, Nashville is located in Sections 13 and 24, Township 9 North, Range 2 East, and Sections 18 and 19, Township 9 North, Range 3 East, in Washington Township. The Town lies at the center and is the county seat of Brown County, Indiana. The Project Area includes the entire municipal service area for the Town of Nashville, Indiana. Primary problem areas have been identified by town officials as focal points of the Project Area. However, due to the topography and location of those focal points, the Project Area was expanded to include much of the downtown and adjacent areas near downtown.

Refer to Appendix A, **Figure A-1**, for an overview of the Project Area.

1.2 Project Areas

The Town of Nashville identified 3 initial priority project areas. These areas are sections of Town that are located within the Study Area and are as follows:

- AREA 1 - along Main Street/Old State Road 46 from Locust Lane to Hard Truth Distilling Co.
- AREA 2 - bound by Main Street to the south, Mound Street to the north, Jackson Branch Road to the west, and Locust Lane to the east.
- AREA 3 - bound by Pat Reily Drive/School House Lane and North Fork Salt Creek to the south, Main Street to the north, and Old School Way to the east.

Refer to Appendix A, **Figure A-1**, for an overview of the sub-areas identified above within the Project Area.

1.3 Purpose

The Master Plan is used to help the Town guide decisions and meet long-term goals. This Master Plan covers a planning period from 2021 to 2040. Stormwater Management Goals include the following:

- Drainage
 - Significantly reduce the occurrence of local flooding due to wet weather events.
 - Prevent property damage due to flooding from a wet weather event.
 - Reduce ponding that propagates insects, annoyance, and health risk.

- Reduce basement and crawl space flooding.
- Maintain existing system to avoid infrastructure failure.
- Volume Management
- Sustainability

The goals stated above, as well as budget constraints and community involvement, provide guidance for developing and evaluating project alternatives and priorities.

1.4 Stakeholders

The Master Plan considers the wants and needs of the various stakeholders of the stormwater management system. These stakeholders include the residential users, commercial and industrial businesses, other non-residential users, the general public, elected officials, and all others who live in, work in, or visit the Town of Nashville. Key stakeholders include the following:

- Utility Service Board, Town of Nashville
- Town Council, Town of Nashville
- Citizens, business owners, and other community members

The capital improvement projects should involve these key stakeholders during all phases of the project, especially during planning and design.

1.5 Background

The Town of Nashville, Indiana manages its stormwater system through the Town's Utility Services Board. The Town operates and maintains the stormwater infrastructure within the town limits and capital projects are funded by allowances voted on by the Town Council. The Town implements stormwater design and construction standards for new development and re-developments and enforces an illicit discharge ordinance that targets illegal dumping and illegal connections to the stormwater system.

This Master Plan will allow the Town to plan for stormwater infrastructure improvement projects and be prepared to comply with regulatory requirements from the state.

1.5.1 Existing Studies and Resources

The Town of Nashville had no existing studies and resources available. Therefore, DB relied on the following resources to assist in developing the Master Plan:

- Brown County Geographical Information Systems (GIS)
 - Town Limits
 - Parcels
 - Right-of-Way
- IndianaMap Geographical Information Systems (GIS)
 - Hydrologic Information
 - North Fork Salt Creek Floodplain
- Town Manager – Dax Norton
 - Field Investigation Input

- Citizen/Business Owner Complaint Data

1.5.2 Watersheds

The Town of Nashville is 1.5 square miles and is located within three HUC 14 watersheds: North Fork Salt Creek-Owl/Lick Creeks, North Fork Salt Creek-Clay Lick/Greasy Creeks, and North Fork Salt Creek-East Fork. The project area mainly falls within the North Fork Salt Creek – Owl Lick Creeks and Clay Lick/Greasy Creeks watersheds. The sub-drainage areas were developed for the project area based on the natural drainage patterns and existing infrastructure within the area. The sub-drainage areas are as follows:

- Hillside Drainage entering Nashville from the north into existing storm sewer
- Hillside Drainage entering Nashville from the north into existing conveyance ditch
- Drainage entering Jackson Branch from the east via existing storm sewer
- Drainage entering conveyance ditch from downtown via existing storm sewer
- Drainage entering North Fork Salt Creek from downtown via existing storm sewer

Refer to Appendix A, **Figure A-2**, for an overview of the watersheds and receiving waters map.

1.5.3 Wetlands, Floodplains, and Floodways

The floodplains within the Town of Nashville area are North Fork Salt Creek and Greasy Creek. There are no wetlands located within the project area.

See Appendix A, **Figure A-6a**, **Figure A-6b** and **Figure A-7**, for an exhibit of the floodplain for North Fork Salt Creek and Greasy Creek as well as an exhibit of the wetland investigation for the project area.

1.5.4 Soils

The soils of the Town of Nashville consist mostly of silt loam according to the United States Department of Agriculture (USDA) Web Soil Survey. However, there are some areas with clayey soils. Loam soils tend to promote drainage and be high in nutrients. Clay soils tend to inhibit drainage, resulting in low to moderate infiltration rates depending on the depth to the water table.

The Study Area is primarily Pekin silt loam, which is rated as a “moderate well drained” soil. The soil is classified as hydrologic group C/D soils when the water table is high. Group C/D soils have slow infiltration rates and high runoff potential.

These soil conditions affect the amount of stormwater runoff generated during a storm event, limit the amount of runoff pollution that is filtered into the ground, and increase the amount of runoff pollution that is concentrated in the stormwater system.

1.5.5 Current and Planned Land Use

The current land use for the Town of Nashville is predominately commercial throughout much of downtown with small-acreage residential use surrounding the downtown area. The planned land use for the Town is to remain in its current state in the near-term. However, long-term planning for future development is encouraged where careful considerations are given to the preservation of the

Town's artisan nature and the fiscal impacts of new development. Development should not outpace infrastructure improvements or the Town's ability to maintain them.

2.0 CURRENT CONDITIONS

The existing stormwater infrastructure is maintained by the Town of Nashville's Municipal Utilities (NMU) and it consists of a series of storm sewers and open ditches within the Town's right-of-way or drainage easements. The existing system is within the Town of Nashville limits. Undersized pipes and lack of stormwater infrastructure in some areas cause flooding during moderate storm events. The infrastructure within the Town is also aging and deteriorating.

A complete evaluation of each existing storm structure was not completed as part of this study. Instead, this evaluation focused on identifying areas with drainage problems and documenting the cause of the drainage issue. Field evaluation of these areas took place in January through April 2021. A photo log was compiled with a record of all photos take and a description of findings with each.

Refer to Appendix C for the Photo Log.

2.1 Potential Project Areas

The Town identified 3 potential project areas that experience significant drainage issues. The existing conditions of the stormwater infrastructure in these areas is detailed in the following sections. Most of the existing storm inlets, structures, and sewers in these areas are aged and appear undersized and/or deteriorated.

2.1.1 AREA 1

AREA 1 spans along Main Street/Old SR 46 from Locust Lane to the entrance to Hard Truth Distilling Co. The existing stormwater infrastructure for the west portion of Main Street/Old SR 46 between Locust Lane and Artist Drive drains towards a low point near the Redbud Terrace Shops and enters an existing conveyance channel flowing north to south. The conveyance channel is immediately downstream of an existing, deteriorating structure under Main Street/Old SR 46 that daylight upstream within a wooded area adjacent to a residence at 161 Gould Street. The existing stormwater infrastructure for the east portion of Main Street/Old SR 46 drains via a series of drive culverts and roadside ditches towards Greasy Creek and its tributary coming from the east and west direction. Greasy Creek is conveyed under Main Street/Old SR 46 via an aging and deteriorating bridge and the Greasy Creek tributary/Greasy Creek confluence is 400 feet downstream of the bridge.

From field investigation, citizen complaint data, and input from the Town, there is evidence of ponding water at low points where there are no inlets and roadway overtopping from undersized drive culverts and roadside ditches during moderate storm events.

2.1.2 AREA 2

AREA 2 is the northern section of downtown Nashville that is bound by Main Street/Old SR 46 to the south and Mound Street to the north, Jackson Branch Road to the west and Locust Lane to the east. The existing stormwater infrastructure for the west portion drains via enclosed storm sewer and roadside ditch towards Jackson Branch. The existing stormwater infrastructure for the east

portion drains via enclosed storm sewer south towards Main Street/Old SR 46 and on down toward Washington Street.

From field investigation, citizen complaint data, and input from the Town, there is evidence of moderate to severe ponding within the west portion due to deteriorating downstream outfalls into Jackson Branch. Backflow from Jackson Branch may be prohibiting stormwater relief from the upstream system due to malfunction of the existing flap gates or blockages on the downstream outfall pipes. Roadside drainage systems are very poor in this area as well. Moderate to severe ponding is evident for the east portion draining south towards Main Street/Old SR 46. This is likely caused by aging and undersized storm sewer when accounting for the large amount of drainage area creating channelized flow entering the system north/northeast of the town limits.

2.1.3 AREA 3

AREA 3 is the southern section of downtown Nashville that is bound by Pat Reily Drive, School House Lane and North Fork Salt Creek to the south, Main Street/Old SR 46 to the north and Old School Way to the east. The existing stormwater infrastructure for this area mainly drains via enclosed storm sewer towards multiple outfalls upstream of North Fork Salt Creek on the south side of Washington Street. There is a portion of existing stormwater infrastructure that drains via the conveyance channel located east of Old School Way and along the rear property lines. This portion drains south, then west, towards Pat Reily Drive. Ultimately, all existing stormwater infrastructure within AREA 3, as well as large portions of upstream AREA 2, outfall towards the area at the southwest quadrant of Washington Street and Jefferson Street, discharging into North Fork Salt Creek.

From field investigation, citizen complaint data, and input from the Town, there is evidence of severe ponding and roadway overtopping within this area. The majority of the Town drains towards this location and the existing storm sewer is deteriorating and undersized based on the large upstream contributing drainage area both within and beyond the town limits.

3.0 FUTURE CONDITIONS

3.1 Current Population

The 2010 Census Data lists the total population of Brown County to be 15,242 and the population of Nashville to be 803. STATS Indiana estimates the current (2020) population of Brown County to be 15,112 and the population of Nashville to be 1,097.

3.2 Population Projection

The historical population data (1980-2010) and the population projections (2014-2015) were obtained from STATS Indiana. The historical population change of Brown County was up 23% from 1980 to 2010 while the town experienced 14% growth during that same period.

The population of Brown County is projected to decrease by 15% from 2010 to 2040. It was assumed that the ratio of historical growth rates of Brown County and the Town would be consistent for the projected population.

The Town's population was projected based on the ratio of Nashville's historical population and Brown County's projected population change as shown in **Table 3-1** below.

Table 3-1: Projected Population

Year	Population	
	Brown County	Nashville
1980	12,377	705
1990	14,080	873
2000	14,957	825
2010	15,242	803
2015	14,919	786
2020	14,631	771
2025	14,490	756
2030	14,171	739
2035	13,742	716
2040	13,217	688

4.0 PROJECT SUMMARY

Through review of field investigation results, citizen complaint data, and recommendations from the Town, project areas were delineated and evaluated. A consistent process was used to provide uniformity in the development and analysis of each project.

4.1 Methodology

The project identification and analysis process used the following methodology.

4.1.1 Field Evaluation

Due to the interconnectivity between AREA 2 and AREA 3, the entire town was visited to gain a better understanding of the condition of stormwater structures and pavement as well as to determine pipe sizes.

The following streets were evaluated in the field:

- Washington Street
- Franklin Street
- Main Street/Old SR 46
- Gould Street
- Mound Street
- Johnson Street
- Jefferson Street
- Van Buren Street/SR 135

The following alleyways were evaluated in the field:

- Pat Reily Drive
- Pittman House Lane
- Old Hickory Lane
- Molly Lane
- Printers Lane
- Sycamore Street
- Bittersweet Lane
- Honeysuckle Lane
- Old School Way
- Locust Lane

4.1.2 Project Identification

Based on input from the Town, field investigation, and evaluation of current GIS data collection, the initial project areas within the Town were recommended for one or more of the following projects: GIS Mapping, conveyance channel improvements, roadside drainage improvements, and proposed trunkline conveyance with stormwater infrastructure reconstruction.

All areas were recommended for a GIS Mapping project because the available GIS for Brown County does not provide interconnected storm sewer information layer as part of the application. It was also found during field investigation that some infrastructure layouts were unable to be manually confirmed from the ground level. This can be achieved through a detailed storm sewer system inspection with the aid of automated underground analysis. GIS mapping projects are high priority because having a better understanding of pipe sizes and materials helps identify where pipes may be undersized, or where materials may be beyond their useful service life. This information helps prioritize project areas.

4.1.3 Assumptions

The following assumptions were made when recommending projects and creating cost estimates:

- For all projects, number of structures and length of pipe were determined based on above ground GIS data collection by DB personnel.
- Sizes of pipes were determined during field investigation from an above ground point of reference.
- For conveyance channel improvements projects, it was assumed that the existing channel would be cleared of obstructions, consistent channel geometry would be used, conveyance structure replaced, and appropriate channel linings and energy dissipation would be installed.
- For roadside drainage improvements projects, it was assumed open ditches would be constructed/rehabilitated on both sides of the road where applicable. Driveway culverts would be reconstructed in-kind or upsized appropriately.
- For proposed trunkline conveyance with stormwater infrastructure reconstruction projects, it was assumed that a centralized downstream trunkline would be strategically located to provide the optimum conveyance and connectivity to all upstream improvements. Included in these projects, is the replacement or installation of curb and gutter, as well as appropriately spaced curb inlets, yard inlets, and secondary storm sewer. Limits of disturbance would be from back-of-curb to back-of-curb along all affected roadways.

4.1.4 Design Criteria

Pipe sizing calculations were completed at a preliminary level for the recommended projects. The following key design criteria, based upon industry standards and the INDOT Design Manual, were implemented as guidelines and are as follows:

- Runoff should be calculated using SCS Hydrograph Routing Method or Rational Method
- The hydraulic grade line from the 10-year storm event should be contained within the pipe.
- The hydraulic grade line from the 50-year storm event should be contained within the system.
- The peak flows from the 100-year storm event should not exceed 6 inches of ponding above surface elevation.
- The minimum size storm sewer shall be 12-inch diameter.
- Storm sewers should have a minimum cover of 1 foot; 2 feet of cover is preferred.

4.2 Recommended Projects

Table 4-1 summarizes the recommended project for each priority area. A more detailed project description for each area follows.

Table 4-1: Projects Summary

ID	GIS Mapping	Conveyance Improvements	Roadside Improvements	Trunkline/Stormwater Infrastructure
AREA 1	X	X	X	
AREA 2	X		X	X
AREA 3	X		X	X

4.2.1 AREA 1 – Main Street/Old SR 46

AREA 1 was identified as a project area because of aging infrastructure, undersized drive culverts, deteriorating conveyance structures and cross culverts, heavily overgrown/undersized conveyance channel, and shallow/undefined roadside ditches.

4.2.11 GIS Mapping

GIS Mapping is recommended for this area to obtain an accurate understanding of the conveyance channel and interconnected conveyance structures that run north to south from north of Main Street/Old SR 46 to north of School House Lane. GIS Mapping is also recommended for all drive culverts and roadway cross culverts within this area. The estimated engineering fee to perform the GIS Mapping in this area is approximately \$10,000.

4.2.12 Conveyance Improvements

There is an existing conveyance system that drains the upstream hillside and crosses under Main Street/Old SR 46 between Locust Lane and Commercial Street. The stormwater runoff is captured just beyond the northwest property corner at 180 Commercial Street (First Merchants Bank) and is conveyed south via existing infrastructure and discharges into an existing conveyance channel south of Main Street/Old SR 46. From there, runoff travels south via open-channel flow between the property lines of 123 East Main Street and 153 East Main Street, behind the school transportation facility, along the west property line of 132 Washington Street. Flow enters a conveyance structure on the north side of Washington Street and travels south along the west property line of 101 East Washington Street, becomes open channel flow along the school parking lot and terminates on the north side of School House Way into an existing storm system.

The existing conveyance system was observed to be in moderate to poor condition with aging/undersized infrastructure and inadequate channel geometry with heavy vegetative cover along the banks. There were numerous points of potential blockage of flow along the existing channel in need of maintenance. This conveyance system serves as an important aspect of draining the portion of Nashville east of Van Buren Street/SR 135 due to the large volume of water entering the town limits off the hillside from the north.

4.2.13 Roadside Drainage Improvements

There are existing roadside drainage ditches and drive culverts on both sides of Main Street/Old SR 46 from Artist Drive to the Hard Truth Distilling Co. entrance that drain towards Greasy Creek and the UNT to Greasy Creek. The ditches are in good to moderate condition on both sides of the road up to the Brown County Fair Grounds entrance and become increasing poor moving east towards the Hard Truth Distilling Co. entrance. All drive culverts along this stretch are in poor structural condition with evidence of blockages and/or collapse. There is an existing cross culvert in poor condition near the Hard Truth Distilling Co. entrance that conveys flow under Old SR 46. There are also a series of downstream drive culverts and a roadside ditch that convey the UNT to Greasy Creek along the south side of Old SR 46 that need improvement. The drive culverts in this location seem vary in size and the roadside ditch is heavily eroded along its banks.

4.2.14 AREA 1 – System Improvements

Preliminary engineering will need to be completed to finalize improvement recommendations. The improvements and corresponding costs outlined below represent the most conservative recommendation. See Appendix A, **Figure A-3**, for a map showing the extents of the project recommendations.

The key improvements of the system project consist of approximately:

- 150 LFT of 12" RCP
- 130 LFT of 15" RCP
- 205 LFT of 18" RCP
- 205 LFT of 24" RCP
- 460 LFT of 36" RCP
- 575 LFT of 42" RCP
- Headwall Reconstruction
- 960 LFT of Conveyance Channel Reconstruction
- 2850 LFT of Roadside Ditch Reconstruction
- 1600 SYS of Pavement Replacement
- 1500 SYS of Drive Repair

The preliminary estimate of project costs for this project is \$1,167,000. A detailed cost estimate can be seen in Appendix B, **Table B-1**.

4.2.2 AREA 2 – North of Main Street/State Road 46 from Locust Lane to Jackson Branch Road

AREA 2 was identified as a project area due to the presence of moderate to severe ponding at numerous locations throughout. The ponding is likely caused by aging and deteriorated stormwater infrastructure that is undersized and/or clogged by debris. For the west portion of AREA 2, there is the potential of backflow from Jackson Branch causing negative impacts on the upstream infrastructure.

4.2.21 GIS Mapping

GIS Mapping is recommended for this area to obtain an accurate understanding of the existing infrastructure upstream of AREA 3 to the south and discharging into Jackson Branch to the west. The estimated engineering fee to perform GIS Mapping in this area is approximately \$25,000.

4.2.22 Trunkline/Stormwater Infrastructure

A large diameter storm sewer trunkline is recommended for the east portion of AREA 2 to help alleviate local ponding issues and collect runoff into a centralized location to perpetuate flow south towards AREA 3 and toward the ultimate outfall point. The trunkline is recommended to begin at the intersection of Mound Street and Van Buren Street/SR 135 and travel south to the intersection of Van Buren Street/SR 135 and Main Street/Old SR 46. From there, the trunkline will follow Main Street west towards the intersection with Jefferson Street, and turn south to continue to the AREA 3 project. There are secondary storm sewer connections along the main trunkline where it intersects with Mound Street, Gould Street, Main Street/Old SR 46, and Jefferson Street. The secondary storm sewer will provide a suitable outlet for the localized problem areas and intersecting alleyways.

Secondary storm sewer is proposed for the west portion of AREA 2 and will outlet into Jackson Branch. The topography for this portion of town naturally drains west and away from the proposed trunkline above. Therefore, rather force the stormwater to travel against natural drainage patterns, it is recommended that secondary storm sewer be installed west of Jefferson Street along Mound Street, Gould Street and Main Street and outlet into Jackson Branch. The backflow from Jackson Branch is a significant concern to the proposed upstream enclosed sewer and will be remedied with an appropriate backflow prevention device at each outlet.

It is recommended, but not include as part of this Stormwater Master Plan, that Jackson Branch be subject to a hydraulics study to determine the effects of North Fork Salt Creek during significant rainfall events. This will provide a better understanding of the current base flood elevations for Jackson Branch and determine whether the culvert crossing under Main Street/SR 135 is sufficient for the current flows. The estimated engineering fee to perform a hydraulics study for Jackson Branch from North Fork Salt Creek to Main Street/SR 135 is approximately \$65,000.

4.2.23 Roadside Drainage Improvements

A curb and gutter conveyance system is recommended for the entirety of the AREA 2 project. There is evidence of stormwater runoff leaving the roadway and onto adjacent properties at many locations and a curb and gutter system will provide containment of the runoff until it reaches the enclosed sewer system. There are areas where existing curb and gutter is deteriorating and in need of replacement. For alleyway intersections, it is recommended that a roll curb be installed to keep channelized runoff from entering the alleyways with no way to return to the enclosed storm sewer system. The roll curb will provide runoff containment within the roadways while still allowing reduced speed entrance to the adjacent alleyways.

4.2.24 AREA 2 – Trunkline Storm Sewer Improvements

Preliminary engineering will need to be completed to finalize improvement recommendations. The improvements and corresponding costs outlined below represent the most conservative

recommendation. See Appendix A, **Figure A-4**, for a map showing the extents of the project recommendations.

The key improvements of the trunkline project consist of approximately:

- 1035 LFT of 42" RCP
- 3 Storm Manholes, 72" Dia.
- 2080 LFT of Curb and Gutter, Concrete
- 200 LFT of Curb and Gutter, Roll Curb
- 5200 SYS of Urban Roadway Reconstruction
- 310 SYS of Drive Repair

The preliminary estimate of project costs for this project is \$1,766,000. A detailed cost estimate can be seen in Appendix B, **Table B-2-1**.

4.2.25 AREA 2 – Secondary System Improvements

Preliminary engineering will need to be completed to finalize improvement recommendations. The improvements and corresponding costs outlined below represent the most conservative recommendation. Cost estimates for each urban roadway are provided to help facilitate decisions regarding project priority and budgetary limits. See Appendix A, **Figure A-4**, for a map showing the extents of the project recommendations.

The key improvements of the secondary system projects are listed below, and the estimated quantities can be found in **Table B-2-2** thru **Table B-2-6**.

- 12" RCP
- 15" RCP
- 18" RCP
- 24" RCP
- 36" RCP
- Storm Manholes, 48" Dia.
- Storm Manholes, 60" Dia.
- Backflow Prevention Device
- Curb and Gutter, Concrete
- Curb and Gutter, Roll Curb
- Urban Roadway Reconstruction
- Drive Repair

The preliminary estimate of project costs for each individual project are as follows:

Main St. – Old School Way to Van Buren St., Jefferson St. to Jackson Branch (Stream)	\$ 1,599,000
Gould St. – Locust Ln. to Jackson Branch (Stream)	\$ 1,468,000
Mound St. – Locust Ln. to Jackson Branch (Stream)	\$ 1,060,000
Jefferson St. – Mound St. to Main St.	\$ 973,000
Johnson St. – Mound St. to Main St.	\$ 640,000
Total Probable Overall Project Costs (AREA 2 – Secondary System)	\$ 5,740,000

A detailed cost estimate for each secondary storm sewer system within AREA 2 can be seen in Appendix B, **Table B-2-2** thru **Table B-2-6**.

4.2.3 AREA 3 – South of Main Street/State Road 46 from Old School Way to Johnson Street

AREA 3 was identified as a project area due to the presence of moderate to severe ponding at numerous locations throughout. The ponding is likely caused by aging and deteriorated stormwater infrastructure that is undersized and/or clogged by debris. For the portion of AREA 3 south of Washington Street where existing infrastructure conveys stormwater from the conveyance channel (part of AREA 1) west towards North Fork Salt Creek, there is evidence of significant ponding along Pat Reily Drive from Van Buren Street/SR 135 to Jefferson Street.

4.2.31 GIS Mapping

GIS Mapping is recommended for this area to obtain an accurate understanding of the existing infrastructure downstream of AREA 2 to the north and discharging into North Fork Salt Creek to the south. The estimated engineering fee to perform GIS Mapping in this area is approximately \$30,000.

4.2.32 Trunkline/Stormwater Infrastructure

A large diameter storm sewer trunkline is recommended for majority of AREA 3 to help alleviate local ponding issues and collect runoff into a centralized location to perpetuate flow south towards the ultimate outfall point into North Fork Salt Creek. The trunkline is recommended to begin at the intersection of Main Street/Old SR 46 and Jefferson Street and travel south to the intersection of Jefferson Street and Washington Street. From there, the trunkline will follow Washington Street west towards the intersection with Johnson Street, and turn south to outlet into an existing channel upstream of North Form Salt Creek. There are secondary storm sewer connections along the main trunkline where it intersects with Franklin Street, Washington Street, and Johnson Street. The secondary storm sewer will provide a suitable outlet for the localized problem areas and intersecting alleyways.

Secondary storm sewer is proposed for the portion of AREA 3 south of Washington Street and will outlet west into an existing channel upstream of North Fork Salt Creek. The topography for this portion of town naturally drains east to west and will not be a part of the proposed trunkline above. Therefore, rather than force the stormwater to travel against natural drainage patterns, it is recommended that secondary storm sewer be installed along the north side of School House Lane to collect stormwater from the conveyance channel (part of AREA 1) and travel west under Van Buren Street/SR 135, along Pat Reily Drive, and outlet into North Fork Salt Creek.

4.2.33 Roadside Drainage Improvements

A curb and gutter conveyance system is recommended for the entirety of the AREA 3 project. There is evidence of stormwater runoff leaving the roadway and onto adjacent properties at many locations and a curb and gutter system will provide containment of the runoff until it reaches the enclosed sewer system. There are areas where existing curb and gutter is deteriorating and in need of replacement. For alleyway intersections, it is recommended that a roll curb be installed to keep channelized runoff from entering the alleyways with no way to return to the enclosed storm sewer.

The roll curb will provide runoff containment within the roadways while still allowing reduced speed entrance to the adjacent alleyways.

4.2.34 AREA 3 – Trunkline System Improvements

Preliminary engineering will need to be completed to finalize improvement recommendations. The improvements and corresponding costs outlined below represent the most conservative recommendation. See Appendix A, **Figure A-5**, for a map showing the extents of the project recommendations.

The improvements of the trunkline project consist of approximately:

- 435 LFT of 42" RCP
- 435 LFT of 48" RCP
- 425 LFT of 54" RCP
- 2 Storm Manholes, 72" Dia.
- 2 Storm Manholes, 96" Dia.
- 2440 LFT of Curb and Gutter, Concrete
- 250 LFT of Curb and Gutter, Roll Curb
- 5425 SYS of Urban Roadway Reconstruction
- 230 SYS of Drive Repair

The preliminary estimate of project costs for this project is \$1,916,000. A detailed cost estimate can be seen in Appendix B, **Table B-3-1**.

4.2.25 AREA 3 – Secondary System Improvements

Preliminary engineering will need to be completed to finalize improvement recommendations. The improvements and corresponding costs outlined below represent the most conservative recommendation. Cost estimates for each urban roadway are provided to help facilitate decisions regarding project priority and budgetary limits. See Appendix A, **Figure A-5**, for a map showing the extents of the project recommendation.

The key improvements of the secondary system projects are listed below, and the estimated quantities can be found in **Table B-3-2** thru **Table B-3-6**.

- 18" RCP
- 24" RCP
- 42" RCP
- Storm Manholes, 48" Dia.
- Storm Manholes, 72" Dia.
- Curb and Gutter, Concrete
- Curb and Gutter, Roll Curb
- Urban Roadway Reconstruction
- Drive Repair

The preliminary estimate of project costs for each individual project are as follows:

Franklin St. – Old School Way to Johnson St.	\$ 1,099,000
Washington St. – Old School Way to Jefferson St., Johnson St. to Parking Lot	\$ 1,127,000
Along School House Way and Pat Reily Dr.	\$ 556,000
Jefferson St. – Washington St. to Pat Reily Dr.	\$ 507,000
<u>Johnson St. – Main St. to Washington St.</u>	<u>\$ 928,000</u>
Total Probable Overall Project Costs (AREA 3 – Secondary System)	\$ 4,217,000

A detailed cost estimate for each secondary storm sewer system within AREA 3 can be seen in Appendix B, **Table B-3-2** thru **Table B-3-6**.

5.0 MAINTENANCE RECOMMENDATION SUMMARY

A fiscal maintenance plan is recommended for use in determining future operating costs and capital budgets, fees, and utility rates.

Prior to development of an in-depth maintenance plan, inspections should be performed. The inspection work may be completed by the Town or hired out to a consulting firm. Based on the Town’s existing stormwater system, a plan was developed to complete inspections within one year, every five years. A summary of the inspection plan is shown in **Table 5-1** below. The last column is an estimation of the cost for a consulting firm to perform the work including the cost for the field work and a report summarizing the results. Inspection and GIS Mapping may be completed in conjunction allowing for overall cost savings.

Table 5-1: Inspection Plan

<i>Year</i>	<i>LFT of Pipe Inspection</i>	<i>No. of Structure Inspections</i>	<i>Total Manhours per Year</i>	<i>Consulting Cost Estimate</i>
2022	15,000	300	420	\$65,000

The inspection plan includes completing structure inspection data sheets, O & M checklists for all stormwater infrastructure, and cleaning and televising of all pipes. For one Town employee to complete the necessary annual maintenance and inspection at a 35-hour work week, it would take approximately 3 months.

6.0 STORMWATER UTILITY EVALUATION

Communities across Indiana have established stormwater utilities to serve as a practical means of providing funding for stormwater management activities.

A stormwater utility is a legal entity which can manage stormwater activities including administrative functions, planning and engineering, regulation, permitting, maintenance operations, and capital improvements. The stormwater utility provides a method of generating revenue for these activities through user fees.

6.1 User Fees and ERUs

Stormwater utility user fees can be assessed in a variety of ways. The most common is related to the property's use of the service. In the case of stormwater user fees, the service that is being provided is the management of stormwater runoff from the property and the activities that the utility is doing throughout the community to manage stormwater quantity and quality.

The volume and rate of runoff on a property is calculated by the total surface area, the intensity of the rainfall and the percent of impervious surface. Properties with more impervious surface generate more runoff and at a faster flow rate. Properties with less impervious surface generate less runoff and at a slower flow rate. Impervious surfaces tend to collect stormwater pollutants that are deposited on these surfaces. When it rains, stormwater picks up pollutants from impervious surfaces. This increases the potential for reduced water quality in streams, rivers, and ponds.

When using the method based on impervious surface area, fees are established according to "Equivalent Residential Units" or ERUs. The ERU is the base-billing unit. Fundamentally determined, a representative sample of residential properties in the community is selected. The square footage of impervious area for each property in the sample is measured and the total square footage is averaged. The determined average then becomes the base value, in square feet, or the ERU. Residential properties are typically charged a flat rate of one (1) ERU.

- Non-residential properties generally have more impervious area creating increased runoff. Therefore, the amount of impervious area of all non-residential properties should be measured and the properties are appropriated user fees as a *multiple* of the base ERU square footage.

This allows for the non-residential property user fees to be based upon the amount of stormwater runoff generated from the property as compared to the runoff generated from the average residence.

6.2 Benefits of a Stormwater Utility

Four (4) primary benefits of the stormwater utility include:

- A Funding Source – Revenues can be used as a source of funding to supplement or replace the community's expenditures towards stormwater management that are taken from the general tax fund or other department budgets. This enables the general fund to be used for

other community needs. Revenues from the Stormwater Utility user fee can only be used for stormwater management activities.

- **Stability** – Revenues are constant and increase as the community grows. This benefit allows for a consistent funding source for a stormwater maintenance program.
- **Immediate Capital Improvements** – Bonding authority is realized in that revenues generated can be used to pay back bonds.
- **Long-Term Planning** – In conjunction with a Stormwater Master Plan, a proactive and systematic approach may be implemented to fix problem areas over time rather than reacting to complaints or emergencies.

6.3 Current Situation

When discussing the use of a stormwater utility user fee with Town representatives, it was discovered that the Town of Nashville does not currently have an established stormwater utility rate. Therefore, it is in the Town’s best interest to be provided information and an example of a current municipality’s (located in Indiana) stormwater utility rate. The following table summarizes the rate structure:

<i>Category</i>	<i>Fee</i>
Base Fee per Month	\$4.00
Residential Properties	\$2.00 per ERU
Non-Residential Properties	\$2.00 per ERU \$450.00 max fee (at 225 ERUs)

Based on information contained in the Indiana comparative rate study prepared by Baker Tilly Municipal Advisors in September 2019:

- Some Towns and Cities in Indiana have user fees as high as \$18 per month.
- The average residential fee for all communities in Indiana is \$5.62 per month.
- For communities with a population between 10,000 and 25,000 (Example Municipality 2010 population was 20,602) the average residential fee is \$6.35 per month.
- The average residential impervious surface area in Indiana ranges from 1,650 square feet to 12,000 square feet. The average of 72 municipalities surveyed is 3,341 square feet of impervious surface area.

6.4 Summary of Recommendations

The following are a list of recommendations to aide the Town of Nashville in developing and maintaining a stormwater utility:

1. Contract with a rate consultant to evaluate the rate structure.
 - Determine a rate structure that is appropriate to fund current stormwater management cost and accounts for future capital projects, ongoing maintenance, and administrative functions. The stormwater utility funds may be used for

labor/benefits, equipment, supplies, contracted services, and other costs related to stormwater management activities.

- Evaluate whether the base fee per month is adequate to fund expenses. In general, this fee would pay for fixed costs incurred by the utility.
 - Determine if the maximum monthly fee is appropriate. Evaluate options for raising or eliminating the maximum fee.
2. Conduct an audit for the proposed stormwater billing system to complete the following:
- Ensure all new development, annexed properties and properties that have altered their impervious surface area since the original evaluation was completed have been accurately updated in the utility billing system. Start with the list of building permits that have been issued.
 - Verify that all properties with impervious surface area are being billed. Properties that are not served by the water and sewer utilities could have been omitted. Examples might include parking lots or properties served by wells or septic systems.

<i>Recommendation</i>	<i>Estimated Cost</i>
Rate Study – Consulting Services	\$5,000
Audit of Billing System – Consulting Services	\$5,000

7.0 IMPLEMENTATION PLAN

The Town of Nashville operates and maintains their own stormwater infrastructure within town limits. Capital projects are funded by the fees collected by the Town’s stormwater utility.

7.1 Project Costs and Budget

The revenue from the stormwater user fee collection is anticipated to fund all, or part of, all projects outlined in this Master Plan. The maintenance expense is assumed to include mapping updates as structure inspections are completed. Refer to **Table 7-1** below for a summary of project costs for the Stormwater Improvements Projects described in **Section 4.2** of this report.

Table 7-1 Stormwater Improvement Projects Cost Summary

Project Location	Total Project Cost
AREA 1	\$ 1,167,000
AREA 2	
Trunkline Storm Sewer Improvements	\$ 1,766,000
Main St. – Old School Way to Van Buren St., Jefferson St. to Jackson Branch (Stream)	\$ 1,599,000
Gould St. – Locust Ln. to Jackson Branch (Stream)	\$ 1,468,000
Mound St. – Locust Ln. to Jackson Branch (Stream)	\$ 1,060,000
Jefferson St. – Mound St. to Main St.	\$ 973,000
Johnson St. – Mound St. to Main St.	\$ 640,000
AREA 3	
Trunkline Storm Sewer Improvements	\$ 1,916,000
Franklin St. – Old School Way to Johnson St.	\$ 1,099,000
Washington St. – Old School Way to Jefferson St., Johnson St. to Parking Lot	\$ 1,127,000
Along School House Way and Pat Reily Dr.	\$ 556,000
Jefferson St. – Washington St. to Pat Reily Dr.	\$ 507,000
Johnson St. – Main St. to Washington St.	\$ 928,000
Total Stormwater Improvement Project Costs	\$ 11,124,000

The estimated total project cost for potential stormwater improvements is \$11,124,000 in 2021 dollars. When inflation is considered, this total cost increases an estimated 4% every year, resulting in an estimated total cost of \$24,374,000 in 2040. An assessment of the stormwater utility rate and budget related to improvement project need is recommended.

7.2 Funding Sources

Securing adequate, sustainable sources of funding for stormwater management projects presents a significant challenge for municipalities across the United States. Financial constraints can hinder the implementation of effective programs and practices.

The Town of Nashville currently does not collect a stormwater utility fee from utility customers. A recommendation for stormwater utility fee development was provided in **Section 6.0** of this plan. Revenues generated from the utility fees can be budgeted and used as a viable method of funding.

Other options are available in order to finance improvement costs that exceed the stormwater utility budget. Some funding options provide 20-year, low interest loans to allow for high construction costs to be more manageable. **The Town may work with their rate consultant and bond council to investigate other financing options.**

The table on the next page summarizes a variety of funding sources for stormwater management.

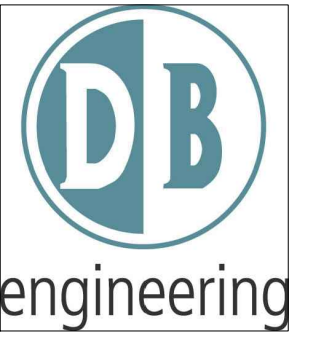
Funding Source	Description
Stormwater Utility Fees	Similar to other utility fees, stormwater utility fees are assessed to utility customers and billed monthly for a consistent stream of revenue. The rate is typically based on a rate study and is established through a rate ordinance. Revenues can be used for stormwater management activities, operation and maintenance, and infrastructure rehabilitation and capital projects.
Taxes	Taxes paid to the Town's general fund may be used for stormwater management. Typically, the general fund is tightly managed to pay for priorities within a community such as education and public safety. Priorities such as regulatory actions, emergency storm damage or flooding issues may be options for general funds.
TIF (Tax Increment Financing)	A tool used by municipal governments to stimulate economic development in areas that are targeted for development or redevelopment. TIFs may be used to finance infrastructure projects or other investments using the anticipation of future tax revenue resulting from new development. Communities can borrow against the incremental tax revenue expected to be received after completion of the improvements to provide initial funding of the investments.
Special Assessments	If a stormwater construction project benefits only a portion of a municipality, it can be funded by fees assessed only to those properties within that area. In this instance, utility customers may pay a higher rate if they are in the special assessment area.
Connection Fees	Connection fees are usually a one-time fee assessed to new customers within a designated area. The customer is reimbursing the municipality for the cost to construct the infrastructure. For stormwater infrastructure, the fee is typically proportional to the area of the customer's property within the infrastructure's drainage area. This might be applied to storm sewer conveyances, water quality treatment, flood control or regional detention projects.
Grants	In Indiana there are some grant programs that can be used for stormwater studies and infrastructure projects. The Indiana Office of Rural Affairs (OCRA) has matching grants that are available to communities who qualify. The area served by the project must demonstrate low to moderate income based on Census data or an income survey. A grant administrator can help to determine if the Town might qualify.
Loans and Bonds	Stormwater projects that have a water quality benefit may qualify for low interest loans through the Indiana Finance Authority (IFA) State Revolving Fund (SRF) program. General obligation (secured by general revenues from the town) and revenue bonds (secured revenues of the stormwater utility) can be used to take on debt that will be paid back over time and with interest.
Town Service Fees	The Town may generate revenue by collecting fees for services provided by the Town. Example services include: plan review, construction inspection, post-construction water quality BMP inspections, and illicit discharge inspections.

APPENDIX A

FIGURES

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Figure A-4	Area 2 Stormwater Improvements
Figure A-5	Area 3 Stormwater Improvements
Figure A-6a	FEMA Floodplain Map – North Fork Salt Creek
Figure A-6b	FEMA Floodplain Map – Greasy Creek
Figure A-7	National Wetlands Inventory – Town of Nashville Wetland Investigation



LEGEND

- Ex. Stormwater Structure (GIS)
- Ex. Storm Sewer Main (GIS)
- ▭ Project Areas
- - - Nashville Town Limits

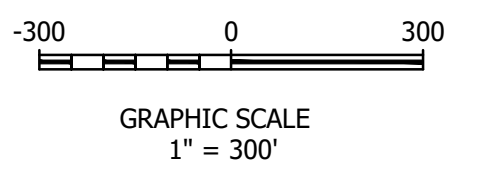
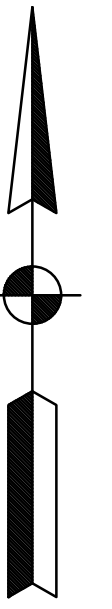
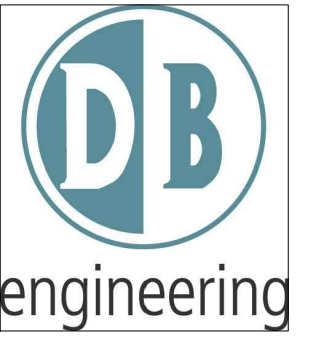


FIGURE A-1
PROJECT AREAS

Town of Nashville, Indiana
Stormwater Study

JULY 2021
118_20001



- LEGEND
- Nashville Town Limits
 - Local Drainage Areas
 - Streams and Waterways

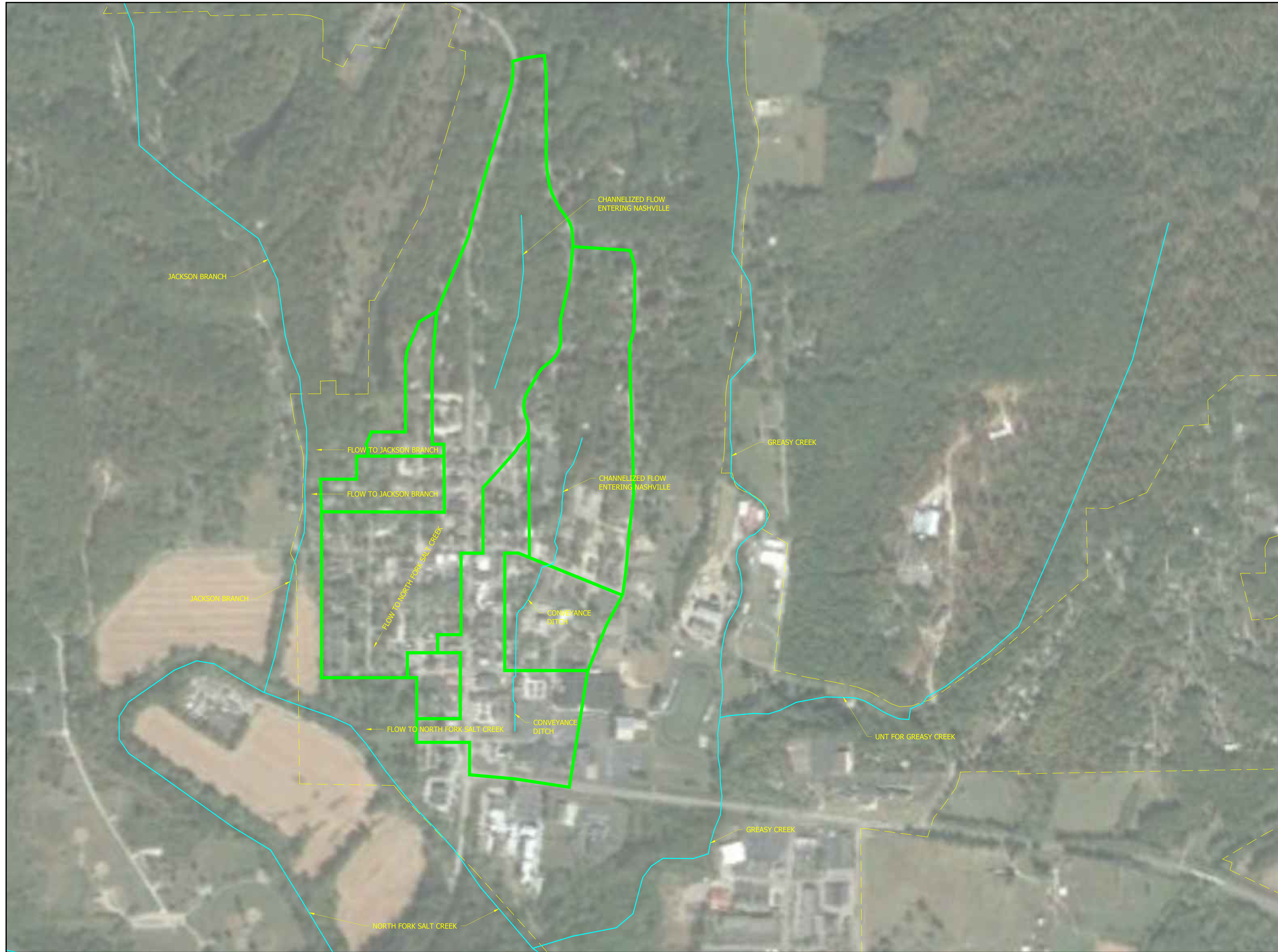
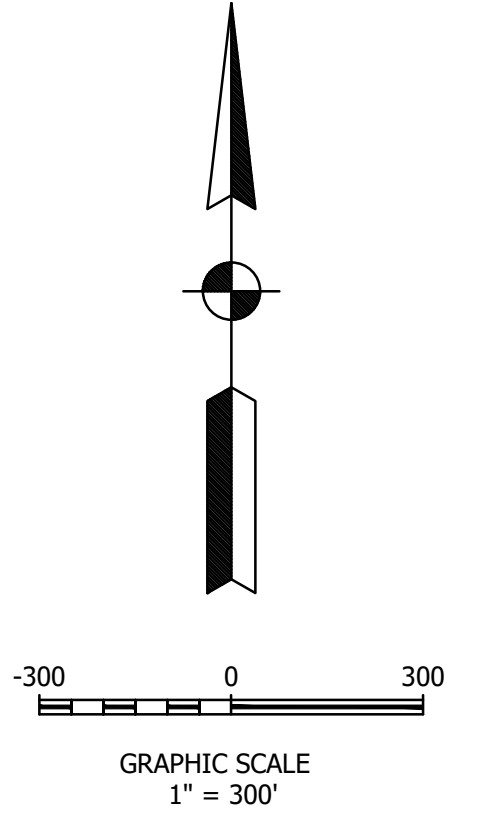
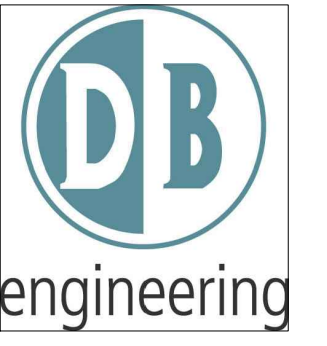
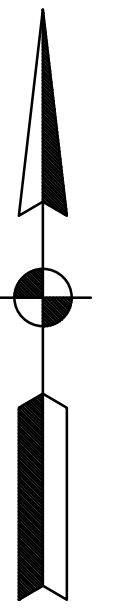


FIGURE A-2
WATERSHEDS &
RECEIVING WATERS



LEGEND

- Roadside Ditch Improvements
- Conveyance Ditch Improvements
- Conveyance Structure Improvements
- Roadway/Drive Culvert Improvements
- AREA 1 Project Limits
- Streams and Waterways



GRAPHIC SCALE
1" = 150'

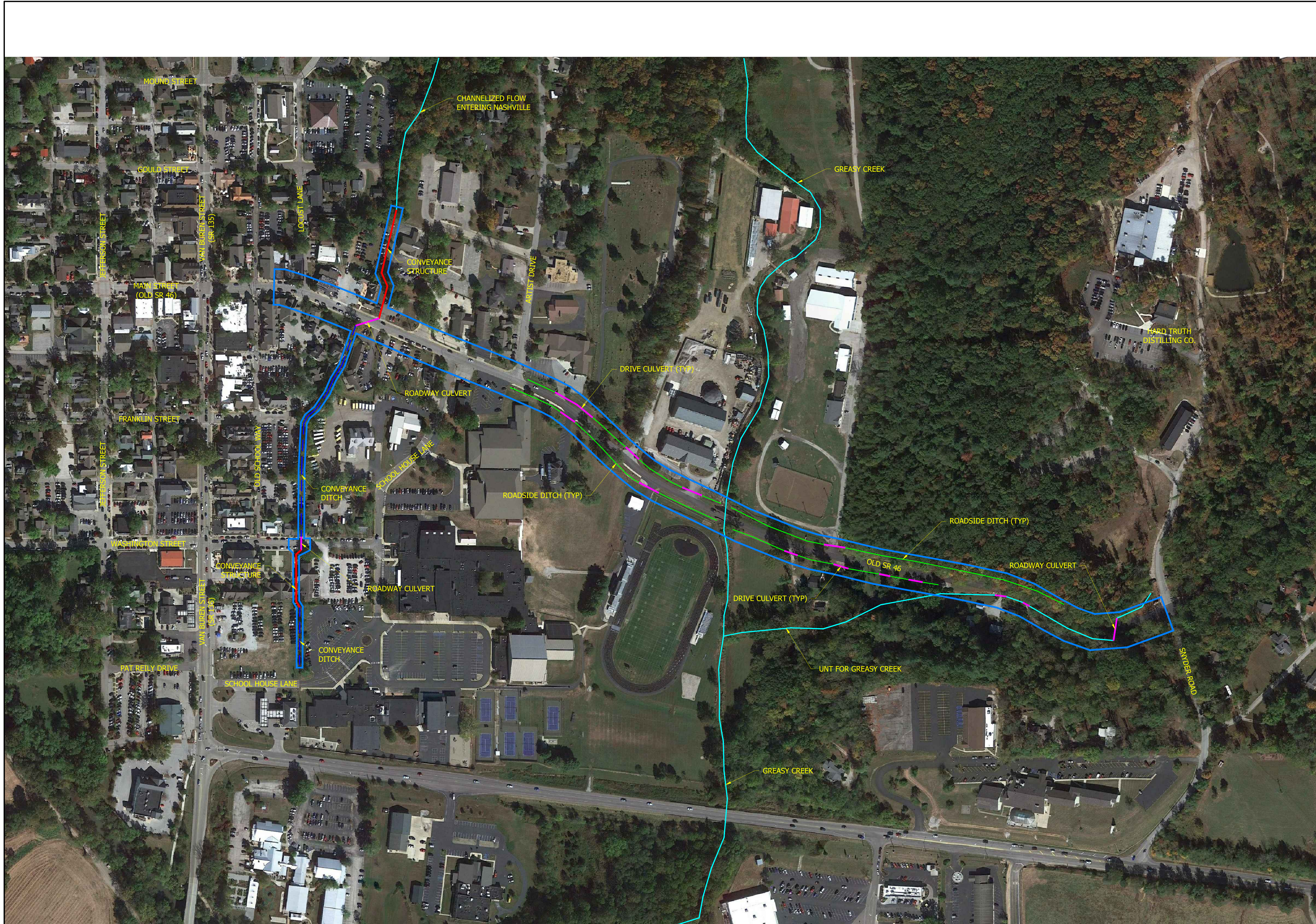
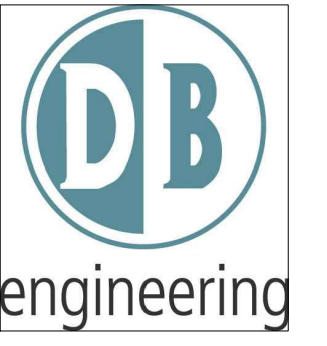


FIGURE A-3

AREA 1
STORMWATER
IMPROVEMENTS

Town of Nashville, Indiana
Stormwater Study

JULY 2021
118_20001



LEGEND

- Trunkline Storm Sewer Improvements
- Secondary Storm Sewer Improvements
- AREA 2 Project Limits
- Streams and Waterways

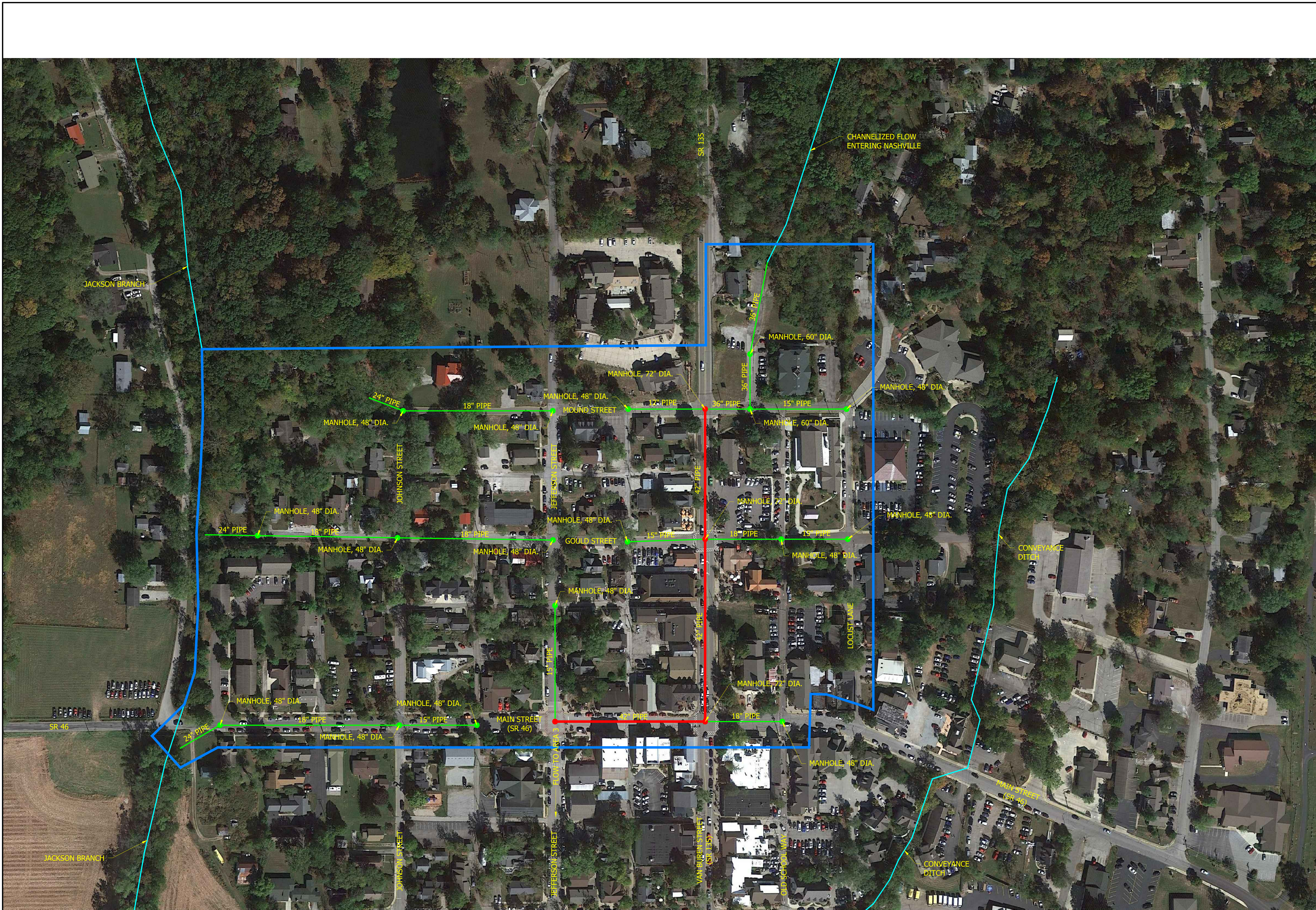
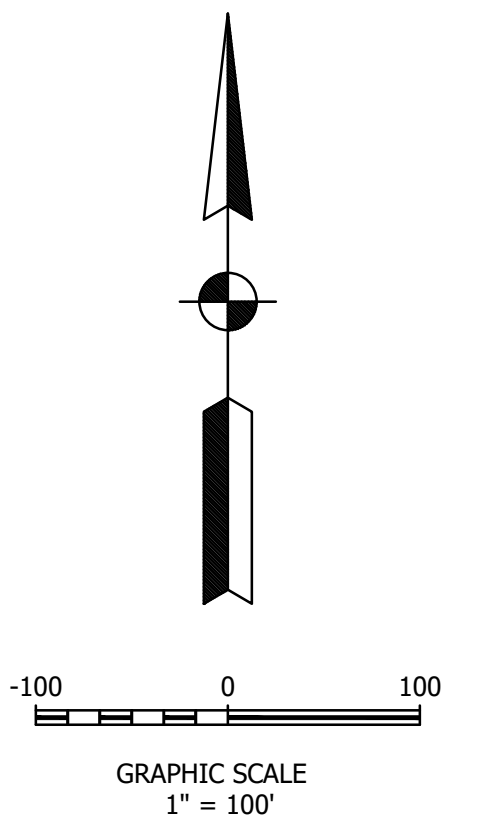
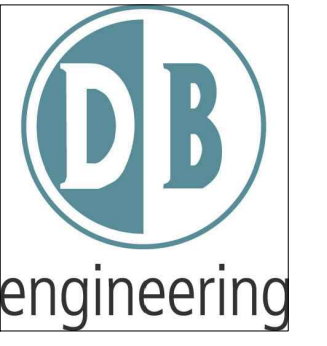


FIGURE A-4
AREA 2
STORMWATER
IMPROVEMENTS



LEGEND

- Trunkline Storm Sewer Improvements
- Secondary Storm Sewer Improvements
- AREA 3 Project Limits
- Streams and Waterways

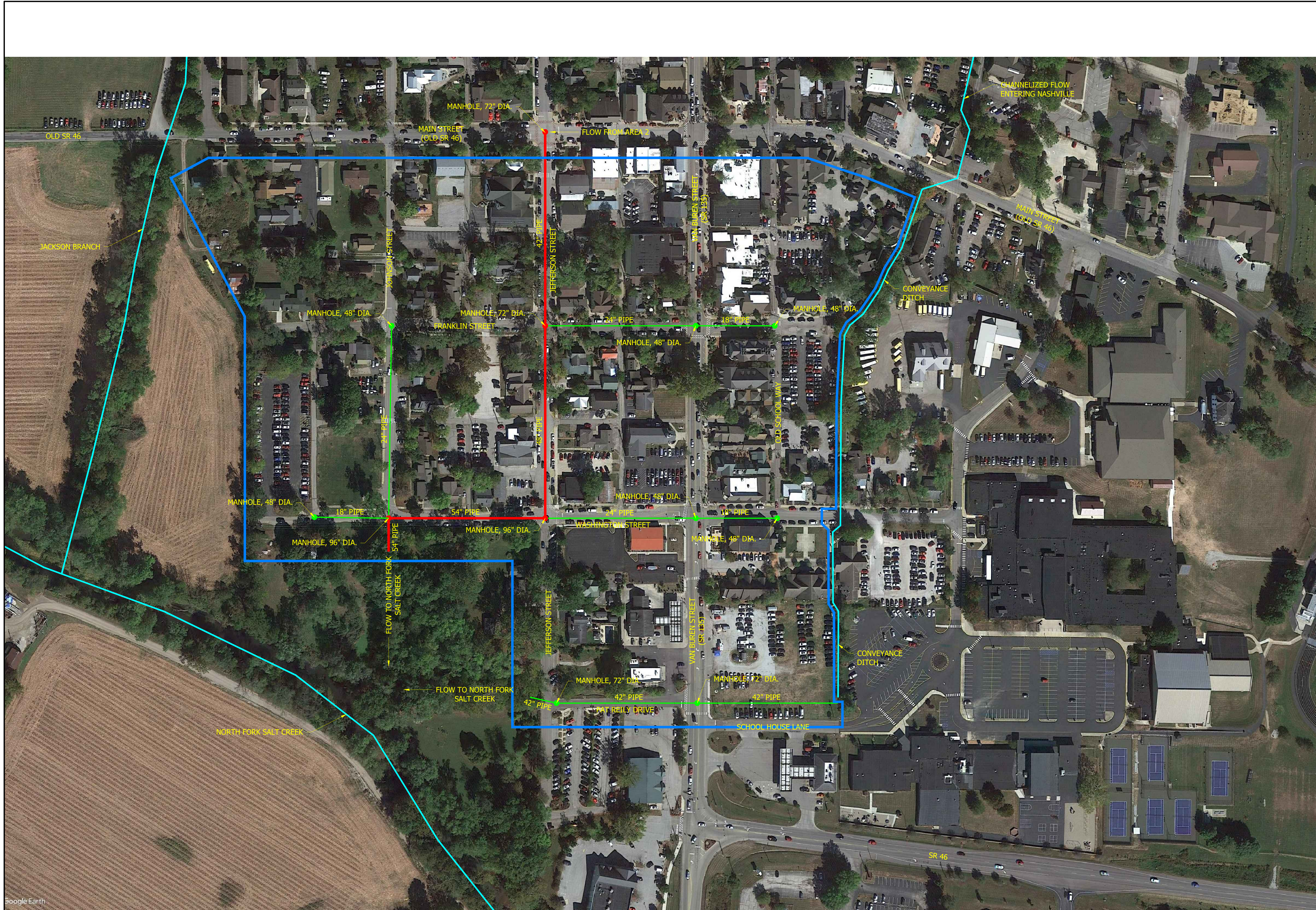
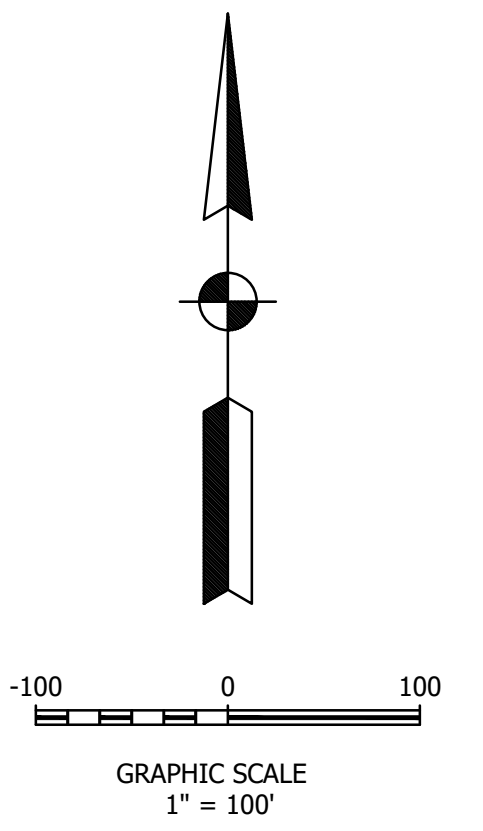


FIGURE A-5
AREA 3
STORMWATER
IMPROVEMENTS

Town of Nashville, Indiana
Stormwater Study

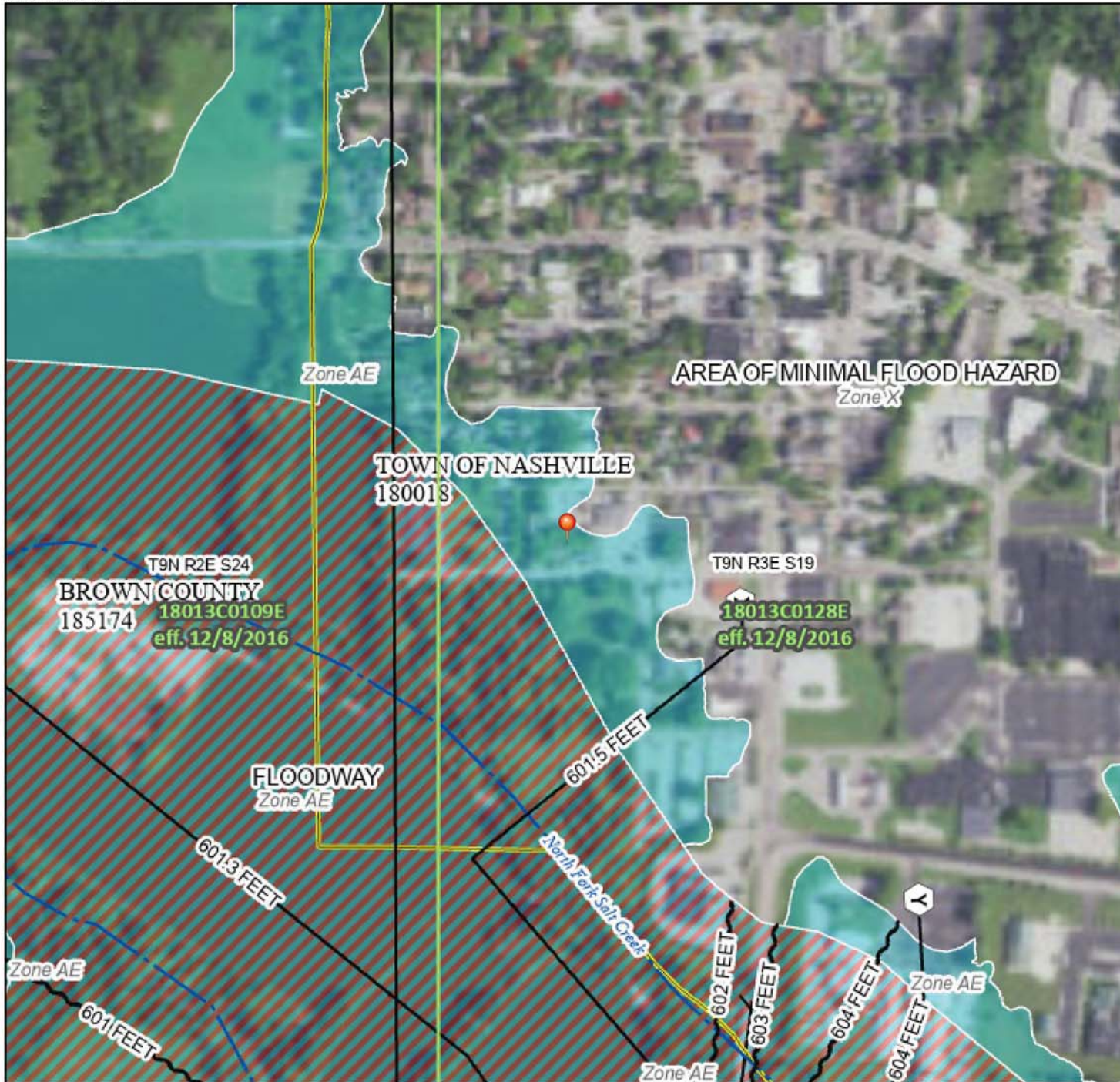
JULY 2021
118_20001

National Flood Hazard Layer FIRMMette



Figure A-6a

86°15'14"W 39°12'32"N



Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

- | | | |
|------------------------------------|--|--|
| SPECIAL FLOOD HAZARD AREAS | | Without Base Flood Elevation (BFE)
<i>Zone A, V, A99</i> |
| | | With BFE or Depth <i>Zone AE, AO, AH, VE, AR</i> |
| | | Regulatory Floodway |
| OTHER AREAS OF FLOOD HAZARD | | 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile <i>Zone X</i> |
| | | Future Conditions 1% Annual Chance Flood Hazard <i>Zone X</i> |
| | | Area with Reduced Flood Risk due to Levee. See Notes. <i>Zone X</i> |
| | | Area with Flood Risk due to Levee <i>Zone D</i> |
| OTHER AREAS | | NO SCREEN Area of Minimal Flood Hazard <i>Zone X</i> |
| | | Effective LOMRs |
| GENERAL STRUCTURES | | Area of Undetermined Flood Hazard <i>Zone D</i> |
| | | Channel, Culvert, or Storm Sewer |
| | | Levee, Dike, or Floodwall |
| OTHER FEATURES | | 20.2 Cross Sections with 1% Annual Chance Water Surface Elevation |
| | | 17.5 Coastal Transect |
| | | Base Flood Elevation Line (BFE) |
| | | Limit of Study |
| | | Jurisdiction Boundary |
| | | Profile Baseline |
| MAP PANELS | | Digital Data Available |
| | | No Digital Data Available |
| | | Unmapped |



The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/9/2021 at 10:50 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

National Flood Hazard Layer FIRMMette



Figure A-6b

86°14'45"W 39°12'32"N



0 250 500 1,000 1,500 2,000 Feet 1:6,000
 Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

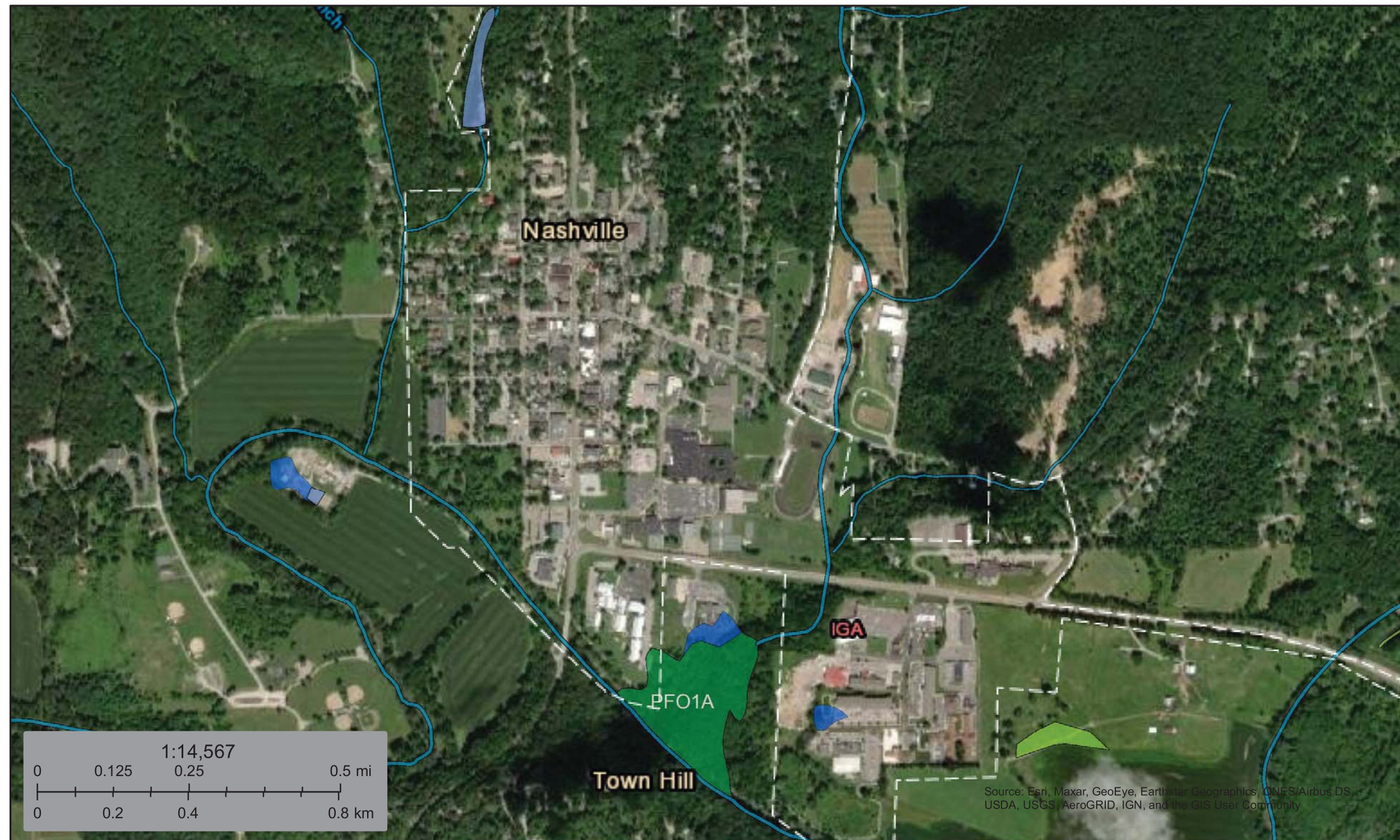
SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
		Regulatory Floodway
OTHER AREAS OF FLOOD HAZARD		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee. See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		NO SCREEN Area of Minimal Flood Hazard Zone X
		Effective LOMRs
GENERAL STRUCTURES		Area of Undetermined Flood Hazard Zone D
		Channel, Culvert, or Storm Sewer
OTHER FEATURES		Levee, Dike, or Floodwall
		20.2 Cross Sections with 1% Annual Chance Water Surface Elevation
MAP PANELS		17.5 Coastal Transect
		Base Flood Elevation Line (BFE)
		Limit of Study
		Jurisdiction Boundary
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
MAP PANELS		Digital Data Available
		No Digital Data Available
		Unmapped
		The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 7/9/2021 at 10:48 AM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

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July 9, 2021

Wetlands

- | | | |
|--------------------------------|-----------------------------------|----------|
| Estuarine and Marine Deepwater | Freshwater Emergent Wetland | Lake |
| Estuarine and Marine Wetland | Freshwater Forested/Shrub Wetland | Other |
| | Freshwater Pond | Riverine |

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

APPENDIX B

COST ESTIMATES

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Table B-2-4	Area 2 – Mound Street Secondary Storm Sewer Improvements
Table B-2-5	Area 2 – Jefferson Street Secondary Storm Sewer Improvements
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Table B-3-5	Area 3 – Jefferson Street Secondary Storm Sewer Improvements
Table B-3-6	Area 3 – Johnson Street Secondary Storm Sewer Improvements



PROJECT: Stormwater Master Plan
 LOCATION: Nashville, Indiana
 COUNTY: Brown County

Table B-1: Preliminary Estimates of Project Costs

AREA 1 Conveyance/Roadside Drainage Improvements
Main St/Old SR 46 - Locust Ln. to Hard Truth Distilling Co. Entrance

Preliminary Engineer's Opinion of Probable Construction Costs^{1,2,3}

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Construction Engineering	1	LS	\$ 20,000	\$ 20,000
2	Mobilization, Demobilization, Bonds, and Insurance	1	LS	\$ 25,000	\$ 25,000
3	Temporary Erosion & Sediment Control	1	LS	\$ 10,000	\$ 10,000
4	Remove Pipe, All Types	1540	LFT	\$ 20	\$ 30,800
5	Full Depth Pavement Reconstruction	1600	SYS	\$ 150	\$ 240,000
6	Drive Repair	1500	SYS	\$ 120	\$ 180,000
7	Roadway Culvert Pipe, 42" RCP	185	LFT	\$ 140	\$ 25,900
8	Drive Culvert Pipe, 42" RCP	185	LFT	\$ 100	\$ 18,500
9	Pipe, 42" RCP	205	LFT	\$ 160	\$ 32,800
10	Roadway Culvert Pipe, 36" RCP	80	LFT	\$ 115	\$ 9,200
11	Pipe, 36" RCP	380	LFT	\$ 120	\$ 45,600
12	Drive Culvert Pipe, 24" RCP	205	LFT	\$ 70	\$ 14,350
13	Drive Culvert Pipe, 18" RCP	205	LFT	\$ 65	\$ 13,325
14	Drive Culvert Pipe, 15" RCP	130	LFT	\$ 60	\$ 7,800
15	Drive Culvert Pipe, 12" RCP	150	LFT	\$ 50	\$ 7,500
16	Pipe End Section, 12"	6	EACH	\$ 650	\$ 3,900
17	Pipe End Section, 15"	4	EACH	\$ 690	\$ 2,760
18	Pipe End Section, 18"	4	EACH	\$ 850	\$ 3,400
19	Pipe End Section, 24"	6	EACH	\$ 1,150	\$ 6,900
20	Open Ditch	2850	LFT	\$ 15	\$ 42,750
21	Headwall Reconstruction	1	LS	\$ 10,000	\$ 10,000
22	Channel Remediation	960	LFT	\$ 50	\$ 48,000
23	Maintenance of Traffic	1	LS	\$ 15,000	\$ 15,000
24	Final Cleanup & Site Restoration	1	LS	\$ 25,000	\$ 25,000
Subtotal (Rounded)					\$ 838,000
20% Contingency					\$ 168,000
Total Probable Construction Costs (Rounded)					\$ 1,006,000

Preliminary Engineer's Opinion of Probable Non-Construction Costs⁴

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Engineering (Design, Permits, & Bid)	1	LS	\$ 101,000	\$ 101,000
2	Engineering (Construction Admin, & Inspection)	1	LS	\$ 60,000	\$ 60,000
Total Probable Non-Construction Costs (Rounded)					\$ 161,000

Total Probable Overall Project Costs \$ 1,167,000



PROJECT: Stormwater Master Plan
 LOCATION: Nashville, Indiana
 COUNTY: Brown County

Table B-2-1: Preliminary Estimates of Project Costs

AREA 2 Trunkline Storm Sewer Improvements
Van Buren St. - Mound St. to Main St., Main St. - Van Buren St. to Jefferson St.

Preliminary Engineer's Opinion of Probable Construction Costs^{1,2,3}

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Construction Engineering	1	LS	\$ 30,000	\$ 30,000
2	Mobilization, Demobilization, Bonds, and Insurance	1	LS	\$ 35,000	\$ 35,000
3	Temporary Erosion & Sediment Control	1	LS	\$ 15,000	\$ 15,000
4	Remove Pipe, All Types	1165	LFT	\$ 20	\$ 23,300
5	Full Depth Pavement Reconstruction	5200	SYS	\$ 150	\$ 780,000
6	Drive Repair	310	SYS	\$ 120	\$ 37,200
7	Curb and Gutter, Concrete	2080	LFT	\$ 40	\$ 83,200
8	Curb and Gutter, Roll Curb	200	LFT	\$ 50	\$ 10,000
9	Curb Inlet, Type J-10	10	EACH	\$ 2,400	\$ 24,000
10	Inlet, Type A-2	4	EACH	\$ 2,200	\$ 8,800
11	Pipe, 42" RCP	1035	LFT	\$ 140	\$ 144,900
12	Manhole, 72" Dia.	3	EACH	\$ 6,000	\$ 18,000
13	Maintenance of Traffic	1	LS	\$ 25,000	\$ 25,000
14	Final Cleanup & Site Restoration	1	LS	\$ 35,000	\$ 35,000
Subtotal (Rounded)					\$ 1,269,000
20% Contingency					\$ 254,000
Total Probable Construction Costs (Rounded)					\$ 1,523,000

Preliminary Engineer's Opinion of Probable Non-Construction Costs⁴

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Engineering (Design, Permits, & Bid)	1	LS	\$ 152,000	\$ 152,000
2	Engineering (Construction Admin, & Inspection)	1	LS	\$ 91,000	\$ 91,000
Total Probable Non-Construction Costs (Rounded)					\$ 243,000

Total Probable Overall Project Costs				\$ 1,766,000
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PROJECT: Stormwater Master Plan
 LOCATION: Nashville, Indiana
 COUNTY: Brown County

Table B-2-2: Preliminary Estimates of Project Costs

AREA 2 Secondary Storm Sewer Improvements

Main St. - Old School Way to Van Buren St., Jefferson St. to Jackson Branch (Stream)

Preliminary Engineer's Opinion of Probable Construction Costs^{1,2,3}

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Construction Engineering	1	LS	\$ 25,000	\$ 25,000
2	Mobilization, Demobilization, Bonds, and Insurance	1	LS	\$ 30,000	\$ 30,000
3	Temporary Erosion & Sediment Control	1	LS	\$ 15,000	\$ 15,000
4	Remove Pipe, All Types	370	LFT	\$ 20	\$ 7,400
5	Full Depth Pavement Reconstruction	4935	SYS	\$ 150	\$ 740,250
6	Drive Repair	525	SYS	\$ 120	\$ 63,000
7	Curb and Gutter, Concrete	2220	LFT	\$ 40	\$ 88,800
8	Curb and Gutter, Roll Curb	350	LFT	\$ 50	\$ 17,500
9	Curb Inlet, Type J-10	10	EACH	\$ 2,400	\$ 24,000
10	Inlet, Type A-2	7	EACH	\$ 2,200	\$ 15,400
11	Pipe, 15" RCP	175	LFT	\$ 55	\$ 9,625
12	Pipe, 18" RCP	580	LFT	\$ 60	\$ 34,800
13	Pipe, 24" RCP	105	LFT	\$ 75	\$ 7,875
14	Manhole, 48" Dia.	3	EACH	\$ 3,100	\$ 9,300
15	Backflow Prevention Device	1	EACH	\$ 10,000	\$ 10,000
16	Maintenance of Traffic	1	LS	\$ 20,000	\$ 20,000
17	Final Cleanup & Site Restoration	1	LS	\$ 30,000	\$ 30,000
Subtotal (Rounded)					\$ 1,148,000
20% Contingency					\$ 230,000
Total Probable Construction Costs (Rounded)					\$ 1,378,000

Preliminary Engineer's Opinion of Probable Non-Construction Costs⁴

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Engineering (Design, Permits, & Bid)	1	LS	\$ 138,000	\$ 138,000
2	Engineering (Construction Admin, & Inspection)	1	LS	\$ 83,000	\$ 83,000
Total Probable Non-Construction Costs (Rounded)					\$ 221,000

Total Probable Overall Project Costs **\$ 1,599,000**



PROJECT: Stormwater Master Plan
 LOCATION: Nashville, Indiana
 COUNTY: Brown County

Table B-2-3: Preliminary Estimates of Project Costs

AREA 2 Secondary Storm Sewer Improvements
Goold St. - Locust Ln. to Jackson Branch (Stream)

Preliminary Engineer's Opinion of Probable Construction Costs^{1,2,3}

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Construction Engineering	1	LS	\$ 25,000	\$ 25,000
2	Mobilization, Demobilization, Bonds, and Insurance	1	LS	\$ 30,000	\$ 30,000
3	Temporary Erosion & Sediment Control	1	LS	\$ 15,000	\$ 15,000
4	Remove Pipe, All Types	1075	LFT	\$ 20	\$ 21,500
5	Full Depth Pavement Reconstruction	4015	SYS	\$ 150	\$ 602,250
6	Drive Repair	265	SYS	\$ 120	\$ 31,800
7	Curb and Gutter, Concrete	2890	LFT	\$ 40	\$ 115,600
8	Curb and Gutter, Roll Curb	300	LFT	\$ 50	\$ 15,000
9	Curb Inlet, Type J-10	12	EACH	\$ 2,400	\$ 28,800
10	Inlet, Type A-2	6	EACH	\$ 2,200	\$ 13,200
11	Pipe, 15" RCP	325	LFT	\$ 55	\$ 17,875
12	Pipe, 18" RCP	840	LFT	\$ 60	\$ 50,400
13	Pipe, 24" RCP	120	LFT	\$ 75	\$ 9,000
14	Manhole, 48" Dia.	6	EACH	\$ 3,100	\$ 18,600
15	Backflow Prevention Device	1	EACH	\$ 10,000	\$ 10,000
16	Maintenance of Traffic	1	LS	\$ 20,000	\$ 20,000
17	Final Cleanup & Site Restoration	1	LS	\$ 30,000	\$ 30,000
Subtotal (Rounded)					\$ 1,054,000
20% Contingency					\$ 211,000
Total Probable Construction Costs (Rounded)					\$ 1,265,000

Preliminary Engineer's Opinion of Probable Non-Construction Costs⁴

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Engineering (Design, Permits, & Bid)	1	LS	\$ 127,000	\$ 127,000
2	Engineering (Construction Admin, & Inspection)	1	LS	\$ 76,000	\$ 76,000
Total Probable Non-Construction Costs (Rounded)					\$ 203,000

Total Probable Overall Project Costs **\$ 1,468,000**



PROJECT: Stormwater Master Plan
 LOCATION: Nashville, Indiana
 COUNTY: Brown County

Table B-2-4: Preliminary Estimates of Project Costs

AREA 2 Secondary Storm Sewer Improvements
Mound St. - Locust Ln. to Jackson Branch (Stream)

Preliminary Engineer's Opinion of Probable Construction Costs^{1,2,3}

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Construction Engineering	1	LS	\$ 15,000	\$ 15,000
2	Mobilization, Demobilization, Bonds, and Insurance	1	LS	\$ 20,000	\$ 20,000
3	Temporary Erosion & Sediment Control	1	LS	\$ 10,000	\$ 10,000
4	Remove Pipe, All Types	1020	LFT	\$ 20	\$ 20,400
5	Full Depth Pavement Reconstruction	2775	SYS	\$ 150	\$ 416,250
6	Drive Repair	15	SYS	\$ 120	\$ 1,800
7	Curb and Gutter, Concrete	2000	LFT	\$ 40	\$ 80,000
8	Curb and Gutter, Roll Curb	150	LFT	\$ 50	\$ 7,500
9	Curb Inlet, Type J-10	8	EACH	\$ 2,400	\$ 19,200
10	Inlet, Type A-2	3	EACH	\$ 2,200	\$ 6,600
11	Pipe, 12" RCP	175	LFT	\$ 50	\$ 8,750
12	Pipe, 15" RCP	215	LFT	\$ 55	\$ 11,825
13	Pipe, 18" RCP	335	LFT	\$ 60	\$ 20,100
14	Pipe, 24" RCP	85	LFT	\$ 75	\$ 6,375
15	Pipe, 36" RCP	435	LFT	\$ 115	\$ 50,025
16	Manhole, 48" Dia.	4	EACH	\$ 3,100	\$ 12,400
17	Manhole, 60" Dia.	2	EACH	\$ 5,500	\$ 11,000
17	Backflow Prevention Device	1	EACH	\$ 10,000	\$ 10,000
18	Maintenance of Traffic	1	LS	\$ 15,000	\$ 15,000
19	Final Cleanup & Site Restoration	1	LS	\$ 20,000	\$ 20,000
Subtotal (Rounded)					\$ 762,000
20% Contingency					\$ 152,000
Total Probable Construction Costs (Rounded)					\$ 914,000

Preliminary Engineer's Opinion of Probable Non-Construction Costs⁴

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Engineering (Design, Permits, & Bid)	1	LS	\$ 91,000	\$ 91,000
2	Engineering (Construction Admin, & Inspection)	1	LS	\$ 55,000	\$ 55,000
Total Probable Non-Construction Costs (Rounded)					\$ 146,000

Total Probable Overall Project Costs **\$ 1,060,000**



PROJECT: Stormwater Master Plan
 LOCATION: Nashville, Indiana
 COUNTY: Brown County

Table B-2-5: Preliminary Estimates of Project Costs

**AREA 2 Secondary Storm Sewer Improvements
 Jefferson St. - Mound St. to Main St.**

Preliminary Engineer's Opinion of Probable Construction Costs^{1,2,3}

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Construction Engineering	1	LS	\$ 15,000	\$ 15,000
2	Mobilization, Demobilization, Bonds, and Insurance	1	LS	\$ 20,000	\$ 20,000
3	Temporary Erosion & Sediment Control	1	LS	\$ 10,000	\$ 10,000
4	Remove Pipe, All Types	200	LFT	\$ 20	\$ 4,000
5	Full Depth Pavement Reconstruction	3310	SYS	\$ 150	\$ 496,500
6	Drive Repair	65	SYS	\$ 120	\$ 7,800
7	Curb and Gutter, Concrete	1490	LFT	\$ 40	\$ 59,600
8	Curb and Gutter, Roll Curb	200	LFT	\$ 50	\$ 10,000
9	Curb Inlet, Type J-10	6	EACH	\$ 2,400	\$ 14,400
10	Inlet, Type A-2	4	EACH	\$ 2,200	\$ 8,800
11	Pipe, 15" RCP	260	LFT	\$ 55	\$ 14,300
12	Manhole, 48" Dia.	1	EACH	\$ 3,100	\$ 3,100
13	Maintenance of Traffic	1	LS	\$ 15,000	\$ 15,000
14	Final Cleanup & Site Restoration	1	LS	\$ 20,000	\$ 20,000
Subtotal (Rounded)					\$ 699,000
20% Contingency					\$ 140,000
Total Probable Construction Costs (Rounded)					\$ 839,000

Preliminary Engineer's Opinion of Probable Non-Construction Costs⁴

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Engineering (Design, Permits, & Bid)	1	LS	\$ 84,000	\$ 84,000
2	Engineering (Construction Admin, & Inspection)	1	LS	\$ 50,000	\$ 50,000
Total Probable Non-Construction Costs (Rounded)					\$ 134,000

Total Probable Overall Project Costs				\$ 973,000
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PROJECT: Stormwater Master Plan
 LOCATION: Nashville, Indiana
 COUNTY: Brown County

Table B-2-6: Preliminary Estimates of Project Costs

**AREA 2 Secondary Storm Sewer Improvements
 Johnson St. - Mound St. to Main St.**

Preliminary Engineer's Opinion of Probable Construction Costs^{1,2,3}

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Construction Engineering	1	LS	\$ 10,000	\$ 10,000
2	Mobilization, Demobilization, Bonds, and Insurance	1	LS	\$ 15,000	\$ 15,000
3	Temporary Erosion & Sediment Control	1	LS	\$ 5,000	\$ 5,000
4	Remove Pipe, All Types	100	LFT	\$ 20	\$ 2,000
5	Full Depth Pavement Reconstruction	2085	SYS	\$ 150	\$ 312,750
6	Drive Repair	50	SYS	\$ 120	\$ 6,000
6	Curb and Gutter, Concrete	1500	LFT	\$ 40	\$ 60,000
7	Curb and Gutter, Roll Curb	100	LFT	\$ 50	\$ 5,000
6	Curb Inlet, Type J-10	6	EACH	\$ 2,400	\$ 14,400
7	Inlet, Type A-2	2	EACH	\$ 2,200	\$ 4,400
23	Maintenance of Traffic	1	LS	\$ 10,000	\$ 10,000
24	Final Cleanup & Site Restoration	1	LS	\$ 15,000	\$ 15,000
Subtotal (Rounded)					\$ 460,000
20% Contingency					\$ 92,000
Total Probable Construction Costs (Rounded)					\$ 552,000

Preliminary Engineer's Opinion of Probable Non-Construction Costs⁴

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Engineering (Design, Permits, & Bid)	1	LS	\$ 55,000	\$ 55,000
2	Engineering (Construction Admin, & Inspection)	1	LS	\$ 33,000	\$ 33,000
Total Probable Non-Construction Costs (Rounded)					\$ 88,000

Total Probable Overall Project Costs				\$	640,000
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PROJECT: Stormwater Master Plan
 LOCATION: Nashville, Indiana
 COUNTY: Brown County

Table B-3-1: Preliminary Estimates of Project Costs

AREA 3 Trunkline Storm Sewer Improvements

Jefferson St. - Main St. to Washington St., Washington St. - Jefferson St. to Johnson St.

Preliminary Engineer's Opinion of Probable Construction Costs^{1,2,3}

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Construction Engineering	1	LS	\$ 30,000	\$ 30,000
2	Mobilization, Demobilization, Bonds, and Insurance	1	LS	\$ 35,000	\$ 35,000
3	Temporary Erosion & Sediment Control	1	LS	\$ 15,000	\$ 15,000
4	Remove Pipe, All Types	315	LFT	\$ 20	\$ 6,300
5	Full Depth Pavement Reconstruction	5425	SYS	\$ 150	\$ 813,750
6	Drive Repair	230	SYS	\$ 120	\$ 27,600
7	Curb and Gutter, Concrete	2440	LFT	\$ 40	\$ 97,600
8	Curb and Gutter, Roll Curb	250	LFT	\$ 50	\$ 12,500
9	Curb Inlet, Type J-10	10	EACH	\$ 2,400	\$ 24,000
10	Inlet, Type A-2	4	EACH	\$ 2,200	\$ 8,800
11	Pipe, 42" RCP	435	LFT	\$ 140	\$ 60,900
12	Pipe, 48" RCP	435	LFT	\$ 150	\$ 65,250
13	Pipe, 54" RCP	425	LFT	\$ 200	\$ 85,000
14	Manhole, 72" Dia.	2	EACH	\$ 6,000	\$ 12,000
15	Manhole, 96" Dia.	2	EACH	\$ 11,700	\$ 23,400
16	Maintenance of Traffic	1	LS	\$ 25,000	\$ 25,000
17	Final Cleanup & Site Restoration	1	LS	\$ 35,000	\$ 35,000
Subtotal (Rounded)					\$ 1,377,000
20% Contingency					\$ 275,000
Total Probable Construction Costs (Rounded)					\$ 1,652,000

Preliminary Engineer's Opinion of Probable Non-Construction Costs⁴

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Engineering (Design, Permits, & Bid)	1	LS	\$ 165,000	\$ 165,000
2	Engineering (Construction Admin, & Inspection)	1	LS	\$ 99,000	\$ 99,000
Total Probable Non-Construction Costs (Rounded)					\$ 264,000

Total Probable Overall Project Costs **\$ 1,916,000**



PROJECT: Stormwater Master Plan
 LOCATION: Nashville, Indiana
 COUNTY: Brown County

Table B-3-2: Preliminary Estimates of Project Costs

AREA 3 Secondary Storm Sewer Improvements
Franklin St. - Old School Way to Johnson St.

Preliminary Engineer's Opinion of Probable Construction Costs^{1,2,3}

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Construction Engineering	1	LS	\$ 15,000	\$ 15,000
2	Mobilization, Demobilization, Bonds, and Insurance	1	LS	\$ 20,000	\$ 20,000
3	Temporary Erosion & Sediment Control	1	LS	\$ 10,000	\$ 10,000
4	Remove Pipe, All Types	655	LFT	\$ 20	\$ 13,100
5	Full Depth Pavement Reconstruction	3345	SYS	\$ 150	\$ 501,750
6	Drive Repair	255	SYS	\$ 120	\$ 30,600
7	Curb and Gutter, Concrete	1720	LFT	\$ 40	\$ 68,800
8	Curb and Gutter, Roll Curb	350	LFT	\$ 50	\$ 17,500
9	Curb Inlet, Type J-10	8	EACH	\$ 2,400	\$ 19,200
10	Inlet, Type A-2	7	EACH	\$ 2,200	\$ 15,400
11	Pipe, 18" RCP	180	LFT	\$ 60	\$ 10,800
12	Pipe, 24" RCP	340	LFT	\$ 75	\$ 25,500
13	Manhole, 48" Dia.	2	EACH	\$ 3,100	\$ 6,200
14	Maintenance of Traffic	1	LS	\$ 15,000	\$ 15,000
15	Final Cleanup & Site Restoration	1	LS	\$ 20,000	\$ 20,000
Subtotal (Rounded)					\$ 789,000
20% Contingency					\$ 158,000
Total Probable Construction Costs (Rounded)					\$ 947,000

Preliminary Engineer's Opinion of Probable Non-Construction Costs⁴

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Engineering (Design, Permits, & Bid)	1	LS	\$ 95,000	\$ 95,000
2	Engineering (Construction Admin, & Inspection)	1	LS	\$ 57,000	\$ 57,000
Total Probable Non-Construction Costs (Rounded)					\$ 152,000

Total Probable Overall Project Costs					\$ 1,099,000
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PROJECT: Stormwater Master Plan
 LOCATION: Nashville, Indiana
 COUNTY: Brown County

Table B-3-3: Preliminary Estimates of Project Costs

AREA 3 Secondary Storm Sewer Improvements

Washington St. - Old School Way to Jefferson St., Johnson St. to Parking Lot

Preliminary Engineer's Opinion of Probable Construction Costs^{1,2,3}

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Construction Engineering	1	LS	\$ 15,000	\$ 15,000
2	Mobilization, Demobilization, Bonds, and Insurance	1	LS	\$ 20,000	\$ 20,000
3	Temporary Erosion & Sediment Control	1	LS	\$ 10,000	\$ 10,000
4	Remove Pipe, All Types	530	LFT	\$ 20	\$ 10,600
5	Full Depth Pavement Reconstruction	3655	SYS	\$ 150	\$ 548,250
6	Drive Repair	60	SYS	\$ 120	\$ 7,200
7	Curb and Gutter, Concrete	1880	LFT	\$ 40	\$ 75,200
8	Curb and Gutter, Roll Curb	150	LFT	\$ 50	\$ 7,500
9	Curb Inlet, Type J-10	8	EACH	\$ 2,400	\$ 19,200
10	Inlet, Type A-2	3	EACH	\$ 2,200	\$ 6,600
11	Pipe, 18" RCP	350	LFT	\$ 60	\$ 21,000
12	Pipe, 24" RCP	340	LFT	\$ 75	\$ 25,500
13	Manhole, 48" Dia.	3	EACH	\$ 3,100	\$ 9,300
14	Maintenance of Traffic	1	LS	\$ 15,000	\$ 15,000
15	Final Cleanup & Site Restoration	1	LS	\$ 20,000	\$ 20,000
Subtotal (Rounded)					\$ 810,000
20% Contingency					\$ 162,000
Total Probable Construction Costs (Rounded)					\$ 972,000

Preliminary Engineer's Opinion of Probable Non-Construction Costs⁴

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Engineering (Design, Permits, & Bid)	1	LS	\$ 97,000	\$ 97,000
2	Engineering (Construction Admin, & Inspection)	1	LS	\$ 58,000	\$ 58,000
Total Probable Non-Construction Costs (Rounded)					\$ 155,000

Total Probable Overall Project Costs				\$ 1,127,000
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PROJECT: Stormwater Master Plan
 LOCATION: Nashville, Indiana
 COUNTY: Brown County

Table B-3-4: Preliminary Estimates of Project Costs

**AREA 3 Secondary Storm Sewer Improvements
 Along School House Ln. and Pat Reily Dr.**

Preliminary Engineer's Opinion of Probable Construction Costs^{1,2,3}

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Construction Engineering	1	LS	\$ 8,000	\$ 8,000
2	Mobilization, Demobilization, Bonds, and Insurance	1	LS	\$ 10,000	\$ 10,000
3	Temporary Erosion & Sediment Control	1	LS	\$ 5,000	\$ 5,000
4	Remove Pipe, All Types	740	LFT	\$ 20	\$ 14,800
5	Full Depth Pavement Reconstruction	1045	SYS	\$ 150	\$ 156,750
6	Drive Repair	120	SYS	\$ 120	\$ 14,400
7	Curb and Gutter, Concrete	750	LFT	\$ 40	\$ 30,000
8	Curb and Gutter, Roll Curb	100	LFT	\$ 50	\$ 5,000
9	Curb Inlet, Type J-10	4	EACH	\$ 2,400	\$ 9,600
10	Inlet, Type A-2	2	EACH	\$ 2,200	\$ 4,400
11	Pipe, 42" RCP	690	LFT	\$ 140	\$ 96,600
12	Manhole, 72" Dia.	2	EACH	\$ 6,000	\$ 12,000
12	Backflow Prevention Device	1	EACH	\$ 15,000	\$ 15,000
13	Maintenance of Traffic	1	LS	\$ 7,000	\$ 7,000
14	Final Cleanup & Site Restoration	1	LS	\$ 10,000	\$ 10,000
Subtotal (Rounded)					\$ 399,000
20% Contingency					\$ 80,000
Total Probable Construction Costs (Rounded)					\$ 479,000

Preliminary Engineer's Opinion of Probable Non-Construction Costs⁴

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Engineering (Design, Permits, & Bid)	1	LS	\$ 48,000	\$ 48,000
2	Engineering (Construction Admin, & Inspection)	1	LS	\$ 29,000	\$ 29,000
Total Probable Non-Construction Costs (Rounded)					\$ 77,000

Total Probable Overall Project Costs				\$	556,000
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PROJECT: Stormwater Master Plan
 LOCATION: Nashville, Indiana
 COUNTY: Brown County

Table B-3-5: Preliminary Estimates of Project Costs

AREA 3 Secondary Storm Sewer Improvements
Jefferson St. - Washington St. to Pat Reily Dr.

Preliminary Engineer's Opinion of Probable Construction Costs^{1,2,3}

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Construction Engineering	1	LS	\$ 8,000	\$ 8,000
2	Mobilization, Demobilization, Bonds, and Insurance	1	LS	\$ 10,000	\$ 10,000
3	Temporary Erosion & Sediment Control	1	LS	\$ 5,000	\$ 5,000
4	Remove Pipe, All Types	150	LFT	\$ 20	\$ 3,000
5	Full Depth Pavement Reconstruction	1730	SYS	\$ 150	\$ 259,500
6	Drive Repair	80	SYS	\$ 120	\$ 9,600
7	Curb and Gutter, Concrete	890	LFT	\$ 40	\$ 35,600
8	Curb and Gutter, Roll Curb	50	LFT	\$ 50	\$ 2,500
9	Curb Inlet, Type J-10	4	EACH	\$ 2,400	\$ 9,600
10	Inlet, Type A-2	2	EACH	\$ 2,200	\$ 4,400
11	Maintenance of Traffic	1	LS	\$ 7,000	\$ 7,000
12	Final Cleanup & Site Restoration	1	LS	\$ 10,000	\$ 10,000
Subtotal (Rounded)					\$ 364,000
20% Contingency					\$ 73,000
Total Probable Construction Costs (Rounded)					\$ 437,000

Preliminary Engineer's Opinion of Probable Non-Construction Costs⁴

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Engineering (Design, Permits, & Bid)	1	LS	\$ 44,000	\$ 44,000
2	Engineering (Construction Admin, & Inspection)	1	LS	\$ 26,000	\$ 26,000
Total Probable Non-Construction Costs (Rounded)					\$ 70,000

Total Probable Overall Project Costs				\$	507,000
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PROJECT: Stormwater Master Plan
 LOCATION: Nashville, Indiana
 COUNTY: Brown County

Table B-3-6: Preliminary Estimates of Project Costs

**AREA 3 Secondary Storm Sewer Improvements
 Johnson St. - Main St. to Washington St.**

Preliminary Engineer's Opinion of Probable Construction Costs^{1,2,3}

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Construction Engineering	1	LS	\$ 15,000	\$ 15,000
2	Mobilization, Demobilization, Bonds, and Insurance	1	LS	\$ 20,000	\$ 20,000
3	Temporary Erosion & Sediment Control	1	LS	\$ 10,000	\$ 10,000
4	Remove Pipe, All Types	1010	LFT	\$ 20	\$ 20,200
5	Full Depth Pavement Reconstruction	2800	SYS	\$ 150	\$ 420,000
6	Drive Repair	145	SYS	\$ 120	\$ 17,400
7	Curb and Gutter, Concrete	1680	LFT	\$ 40	\$ 67,200
8	Curb and Gutter, Roll Curb	150	LFT	\$ 50	\$ 7,500
9	Curb Inlet, Type J-10	8	EACH	\$ 2,400	\$ 19,200
10	Inlet, Type A-2	2	EACH	\$ 2,200	\$ 4,400
11	Pipe, 24" RCP	435	LFT	\$ 75	\$ 32,625
12	Manhole, 48" Dia.	1	EACH	\$ 3,100	\$ 3,100
13	Maintenance of Traffic	1	LS	\$ 10,000	\$ 10,000
14	Final Cleanup & Site Restoration	1	LS	\$ 20,000	\$ 20,000
Subtotal (Rounded)					\$ 667,000
20% Contingency					\$ 133,000
Total Probable Construction Costs (Rounded)					\$ 800,000

Preliminary Engineer's Opinion of Probable Non-Construction Costs⁴

Item #	Description	Est. Qty	Unit	Unit Price	Total Price
1	Engineering (Design, Permits, & Bid)	1	LS	\$ 80,000	\$ 80,000
2	Engineering (Construction Admin, & Inspection)	1	LS	\$ 48,000	\$ 48,000
Total Probable Non-Construction Costs (Rounded)					\$ 128,000

Total Probable Overall Project Costs				\$ 928,000
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PROJECT: Stormwater Master Plan

LOCATION: Nashville, Indiana

COUNTY: Brown County

Preliminary Estimates of Project Costs

Cost Estimate Notes

- 1 All probable construction costs are based upon 2021 dollars and estimated project costs will likely increase with time. Construction costs are volatile and have increased significantly in recent years due primarily to costs of fuel and raw materials. In providing these cost estimates, DB Engineering has no control over the costs of labor, equipment, and materials, or the contractor's method of pricing.
- 2 The cost estimates are based on past similar projects and were made without the benefit of field survey, design plans, and specifications. These estimates are provided on the basis of the Engineer's qualifications and experience. DB Engineering makes no warranty, expressed or implied, as to the accuracy of such cost estimates as compared to bids or actual costs.
- 3 The project area was not reviewed for compliance with ADA guidelines. Construction costs for ADA curb ramps and other ADA facilities are not included in these cost estimates.
- 4 All work is assumed to occur within existing right-of-way and easements, unless otherwise stated.

APPENDIX C

PHOTO LOG

AREA 1

Photo 1



Looking South at Main Street from Artist Drive

Photo 2



Looking South at Main Street from Artist Drive

Photo 3



Looking North at Artist Drive from Main Street

Photo 4



Looking East at Main Street from Cemetery Entrance

Photo 5



Looking at roadside ditch along Main Street near Cemetery Entrance

Photo 6



Looking East at Main Street from Redbud Terrace Shops

Photo 7



Looking West at Main Street from Redbud Terrace Shops

AREA 2

Photo 8



Looking West at Gould Street from Old School Way

Photo 9



Looking South at Van Buren Street from Gould Street

Photo 10



Looking at Conveyance Channel from East end of Gound Street

Photo 11



Looking East at Gould Street roadside from Johnson Street

Photo 12



Looking South at Johnson Street from Gould Street

Photo 13



Looking West at Gould Street from Johnson Street

Photo 14



Looking West at Gould Street from Johnson Street

Photo 15



Outfall into Jackson Branch from West end of Gould Street

Photo 16



Looking East at Outfall into Jackson Branch at Gould Street

Photo 17



Looking West at Jackson Branch from Gould Street

Photo 18



Looking at Residence at Northwest Quadrant of Gould Street and Johnson Street.

Photo 19



Looking West at Main Street from Johnson Street

Photo 20



Looking at South Roadside of Main Street from Johnson Street

Photo 21



Looking at North Roadside of Main Street near Jackson Branch

Photo 22



Looking at North Roadside of Main Street near Apartments

Photo 23



Looking at Main Street from Sycamore Street

Photo 24



Looking North at Jackson Branch from Main Street

Photo 25



Looking South at Old Hickory Lane from Johnson Street

Photo 26



Looking North at Johnson Street from NUMC

AREA 3

Photo 27



Looking East at Washington Street from Parking Lot

Photo 28



Looking East at Washington Street from Parking Lot

Photo 29



Looking South at Washington Street from Johnson Street (OUTFALL)

Photo 30



Looking North at Pat Reily Drive from Subway Parking Lot

Photo 31



Looking North at Pat Reily Drive from Subway Parking Lot