Tippecanoe County

20 North Third Street | Lafayette, IN 47901

Utilities Master Plan

August 2019

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TABLE OF CONTENTS

1. Executive Summary ____ 1-1

1.1 Regulations ____ 1-1

1.2 Scope of Work ____ 1-1

1.3 Review and Updates ____ 1-2

1.4 Recommended Construction Projects ____ 1-2

2. Master Plan Overview ____ 2-1

2.1 Introduction ____ 2-1

2.2 Purpose ____ 2-1

2.3 Planning Approach ____ 2-1

2.3.1 Review of Existing Conditions and Problem Areas ____ 2-1

2.3.2 Internal Work Group and Water Infrastructure Planning Committee ____ 2-1

2.3.3 Detailed Analysis and Recommendations ____ 2-3

2.4 Plan Organization ____ 2-3

3. Project Planning Area ____ 3-1

3.1 Location and Background Information ____ 3-1

3.1.1 Location Maps ____ 3-1

3.2 General Characteristics of the Planning Area ____ 3-1

3.2.1 Climate and Precipitation ____ 3-1

3.2.2 Land Features ____ 3-1

3.2.2.1 Topography ____ 3-1

3.2.2.2 Soils ____ 3-2

3.2.2.3 Karst Features ____ 3-2

3.2.3 Rivers and Streams ____ 3-2

3.2.4 Floodplains ____ 3-2

3.2.5 Wetlands ____ 3-3

3.2.6 Wellhead Protection Areas ____ 3-3

3.3 Water Quality ____ 3-3

3.4 Threatened and Endangered Species ____ 3-3

3.5 Land Use, Population Trends and Projections ____ 3-3

3.6 Growth Areas ____ 3-4

4. Existing Facilities / Specific Problems **4-1**

4.1 Drinking Water *4-1*

4.1.1 Location Map 4-1

4.1.2 Source of Supply 4-1

4.1.3 Water Treatment Area (If Applicable) 4-1

4.1.4 Water Distribution System 4-1

4.1.5 Water Storage System 4-1

4.1.6 Hydraulic Analysis 4-1

4.1.7 Compliance with Safe Drinking Water Act (SDWA) 4-1

4.1.8 Water Pumpage 4-1

4.1.9 Distribution of Users 4-2

4.1.10 Water Loss 4-2

4.1.11 Projected Future Demands 4-2

4.1.12 Fire Protection Considerations 4-2

4.1.13 Current Utility Financial Status 4-2

4.2 Wastewater *4-2*

4.2.1 Location Map 4-2

4.2.2 History 4-2

4.2.3 Present Conditions (Collection System, Treatment System) 4-3

4.2.4 Adequacy of Current Facilities 4-3

4.3 Stormwater *4-3*

4.3.1 Location Map 4-3

4.3.2 History 4-3

4.3.3 Present Conditions (Collection System, Treatment System) 4-4

4.3.4 Adequacy of Current Facilities 4-4

5. Need for Project **5-1**

5.1 Health and Safety *5-1*

5.1.1 Drinking Water 5-1

5.1.2 Wastewater 5-1

5.1.3 Stormwater 5-1

5.2 Regulatory Concerns *5-2*

5.2.1 Drinking Water 5-2

5.2.2 Wastewater 5-2

5.2.3 Stormwater 5-2

5.3 Growth and Future Needs - During the Planning Period 5-2

6. Alternatives Considered 6-4

6.1 Drinking Water 6-4

6.1.1 Localized 6-4

6.1.1.1 Peak Flow 6-4

6.1.1.2 Fire Flow 6-5

6.1.2 Centralized 6-5

6.1.2.1 Peak Flow 6-6

6.1.2.2 Fire Flow 6-6

6.1.3 Regionalized 6-8

6.1.3.1 Delphi 6-8

6.1.3.2 Lafayette 6-9

6.1.4 Design Criteria 6-9

6.1.4.1 Localized 6-9

6.1.4.2 Centralized 6-9

6.1.4.3 Regionalized 6-9

6.1.5 Layout Map 6-10

6.1.5.1 Localized 6-10

6.1.5.2 Centralized 6-10

6.1.5.3 Regionalized 6-10

6.1.6 Environmental Impacts 6-10

6.1.7 Land Requirements 6-10

6.1.8 Construction Problems 6-10

6.1.9 Cost Estimates 6-10

6.1.10 Advantages / Disadvantages 6-12

6.1.10.1 Localized 6-12

6.1.10.2 Centralized 6-12

6.1.10.3 Regionalized 6-12

6.2 Wastewater 6-12

6.2.1 Localized 6-12

6.2.1.1 New Collection System for each Community 6-12

6.2.1.2 Wastewater Treatment Plant (WWTP) for each Community 6-13

6.2.1.3 Discharge for each WWTP 6-14
6.2.2 Centralized 6-15
6.2.2.1 New Collection System for each Community 6-15
6.2.2.2 Conveyance System from Buck Creek and Colburn to Americus 6-16
6.2.2.3 One Wastewater Treatment Plant (WWTP) for all Three Communities Located at Americus 6-16
6.2.2.4 Discharge for the WWTP at Americus 6-17
6.2.3 Regionalized 6-17
6.2.3.1 New Collection System for each Community 6-17
6.2.3.2 Conveyance System from Americus, Buck Creek and Colburn to 6-18
6.2.4 Design Criteria 6-18
6.2.4.1 Localized 6-18
6.2.4.2 Centralized 6-19
6.2.4.3 Regionalized 6-19
6.2.5 Layout Map 6-19
6.2.5.1 Localized 6-19
6.2.5.2 Centralized 6-19
6.2.5.3 Regionalized 6-19
6.2.6 Environmental Impacts 6-19
6.2.7 Land Requirements 6-19
6.2.7.1 Localized 6-19
6.2.7.2 Centralized 6-19
6.2.7.3 Regionalized 6-20
6.2.8 Construction Problems 6-20
6.2.9 Cost Estimates 6-20
6.2.10 Advantages / Disadvantages 6-22
6.2.10.1 Localized 6-22
6.2.10.2 Centralized 6-22
6.2.10.3 Regionalized 6-22
6.3 Stormwater 6-22
6.3.1 Description 6-22
6.3.1.1 Localized 6-22
6.3.1.2 Centralized 6-23
6.3.1.3 Regionalized 6-23

6.3.2 Design Criteria 6-23
6.3.3 Layout Map 6-23
6.3.3.1 Americus 6-24
6.3.3.2 Buck Creek 6-24
6.3.3.3 Colburn 6-24
6.3.4 Environmental Impacts 6-24
6.3.5 Construction Problems 6-24
6.3.6 Cost Estimates 6-24
6.3.7 Advantages / Disadvantages 6-24

7. Recommended Alternative 7-1

7.1 Drinking Water 7-1
7.2 Wastewater 7-1
7.3 Stormwater 7-2

TABLES

Table 1-1 Recommended Structural Project Summary 1-2

Table 2-1 Water Infrastructure Planning Committee Membership 2-2

Table 5-1 Population Trend of Communities in Washington Township 5-3

Table 6-1 Summary of Drinking Water Total Project Costs 6-11

Table 6-2 Summary of Wastewater Total Project Costs 6-21

Table 6-3 Stormwater Alternatives Project Costs 6-24

Table 7-1 Centralized Package Plant Alternative Implementation Schedule 7-2

APPENDICES

Appendix 1: Figures 1

Appendix 2: Study Area Questionnaire 2

Appendix 3: Meeting Minutes 3

Appendix 4: Costs 4

1. EXECUTIVE SUMMARY

Tippecanoe County hired Lochmueller Group to prepare a Utility Master Plan (UMP) to help the County identifies localized drinking water, wastewater and stormwater issues throughout the communities of Americus, Buck Creek and Colburn. This plan is designed to assist the County with prioritizing the identified and known problem areas, address existing and anticipated future utility related concerns, provide a detailed analysis of the high priority issues, and provide recommendations to resolve these problems.

1.1 REGULATIONS

Tippecanoe County is working to maintain compliance with the Safe Drinking Water Act (SDWA) and Clean Water Act (CWA). There are challenges within Americus, Buck Creek and Colburn in meeting the requirements of the SDWA and CWA. The issues will need to be addressed for the communities and to prepare Washington Township for growth. Tippecanoe County will use this UMP to assist it with meeting the regulations enforced by the Indiana Department of Environmental Management (IDEM). Utility issues within the project planning area include but are not limited to drinking water quality and quantity, proper wastewater disposal and stormwater drainage. The UMP will assist the County with compliance with State and Federal requirements.

1.2 SCOPE OF WORK

The following is a general outline of the project tasks:

1. Develop and assist with distribution of a stakeholder questionnaire for use in gathering information from stakeholders regarding known drinking water, sewage treatment and stormwater issues;
2. Drinking Water Alternatives – develop and investigate the following Alternatives, fully developing costs, O&M, and Present Worth by qualitative analysis with regard to feasibility, reliability, expandability or other qualifiers.
    a. Alternative 1 – Develop up to two variations that includes localized water supply, treatment, storage and distribution system improvements for each community.
    b. Alternative 2 - Develop up to two variations that includes a centralized water supply, treatment, and storage system with a separate distribution systems for each community.
    c. Alternative 3 – Develop up to two variations that includes the water supply from an existing source with a distribution system for each community.
3. The feasibility of providing flows adequate for fire protection shall be considered for each alternative.
4. Wastewater Alternatives –
    a. Alternative 1 – Develop up to two variations of a collection system, treatment system, and disposal system for each community on a localized basis.

b. Alternative 2 – Develop up to two variations of a collection system for each community with centralized treatment and centralized disposal.
c. Alternative 3 – Develop up to two variations of a collection system for each community with treatment at an existing treatment and disposal facility.

5. Stormwater Alternatives – Develop up to two alternatives for each community.

1.3 Review and Updates

This document should be considered a roadmap that Tippecanoe County can use to make a reasonable effort to resolve many of the utility related issues in Americus, Buck Creek and Colburn. As it is a 'living document', it should be updated as projects are completed and new issues identified, changes should be made to the document to reflect those updates.

1.4 Recommended Construction Projects

Table 1-1 summarizes the recommended construction projects.

Table 1-1 Recommended Structural Project Summary

Priority	Project	Description	Estimated Capital Cost	Benefits and Remarks
Drinking Water	Centralized Alternative	Peak Flow - Supply, treatment and distribution	**$12,533,800**	Cost savings by supplying drinking water through one supply and treatment system
Wastewater	Centralized Alternative	Package Plant - Collection, treatment and discharge	**$8,971,500**	Cost savings by having one treatment and discharge system
Stormwater	Localized Alternative	Storm sewers, culvert & ditch improvements	**$2,580,800**	Helps correct drainage issues in each community

2. MASTER PLAN OVERVIEW

2.1 INTRODUCTION

As the communities in Washington Township continue to experience drinking water, waste treatment and stormwater runoff issues in various areas, it was determined that a Utility Master Plan (UMP) would be an important planning tool to ensure that the County's needs are properly evaluated so informed decisions can be made for the greatest benefit to Americus, Buck Creek and Colburn.

2.2 PURPOSE

By planning ahead and assessing utility infrastructure improvements required to support current and future goals, Tippecanoe County will be able to meet the needs of its citizens, protect its economic vitality, prepare for growth along the Hoosier Heartland Corridor, and improve the quality of life of its community. This UMP examines existing and anticipated future issues related to drinking water quality and quantity, wastewater treatment, and stormwater runoff and provides recommended alternatives based on the results of a detailed analysis. The plan can be used by current and future county representatives as a guidance document for utility related improvements in Americus, Buck Creek and Colburn.

2.3 PLANNING APPROACH

For this UMP to be successful, there must be a review of Tippecanoe County's current and future planning efforts. Particularly, the Hoosier Heartland Corridor Plan was reviewed to evaluate opportunities to coordinate established land use plans and future development goals for a more holistic approach to the infrastructure planning for Americus, Buck Creek and Colburn. Infrastructure improvements must be aligned with land use patterns to sustain development. This helps to ensure capital improvements are coordinated and implemented for a greater Township-wide benefit at reduced long-term costs.

2.3.1 Review of Existing Conditions and Problem Areas

Step one involves conducting an audit of the existing conditions of the towns of Americus, Buck Creek and Colburn. Information about drinking water, wastewater treatment and stormwater drainage concerns are acquired from Tippecanoe County staff and public input, which helps highlight the problem areas. Identification of these areas allows for certain issues to be grouped and cost-effectively studied. This aids in creating a list of potential solutions.

2.3.2 Internal Work Group and Water Infrastructure Planning Committee

As part of the UMP process, Tippecanoe County developed an internal work group to work with Lochmueller Group on development of the study area and project alternatives. The Internal Work Group is made up of representatives from Tippecanoe County, USDA, and Lochmueller Group. This is to ensure that Lochmueller Group collects information from the key stakeholders in the County to develop the UMP and to keep the County involved in the development of the plan. Minutes from the Internal Work Group meetings are included in **Appendix 3**.

Internal Work Group Meetings:

- Meeting No. 1: February 1, 2019. Kickoff Meeting to discuss goals of the Utility Master Plan development, initial gathering of information, and preliminary alternatives introduction.
- Meeting No. 2: April 9, 2019. Review of the proposed alternatives, gathering of additional information, discussion of a future meeting to develop ideas for a utility district formation.
- Meeting No. 3: May 7, 2019. Review of recommended alternatives with project costs.
- Meeting No. 4: June 6, 2019. Final meeting to discuss final plan.

The UMP looks at providing infrastructure for Americus, Buck Creek and Colburn. It was very important for Tippecanoe County and Lochmueller Group to have involvement from the communities in determining the drinking water, wastewater, and stormwater issues; as well as determining infrastructure needs in each community. A Water Infrastructure Planning Committee was formed and meeting were conducted to get input. The membership of the Water Infrastructure Planning Committee is below in **Table 2-1**. Minutes from the Water Infrastructure Planning Committee meetings are included in **Appendix 3**.

Table 2-1 Water Infrastructure Planning Committee Membership

Name	Department/Town
BJ Bundy	Buck Creek
Tracy Brown	Commissioner
David Byers	Commissioner
Peg Eckhart	Buck Creek
Deb Frost	Americus
Christina Hepworth	Buck Creek
Sharon Hutchison	Grant Facilitator
Levi Huffman	Buck Creek
Barb Knochel	Washington Township
John Metro	Buck Creek
Kay Miller	Americus
Jay Mitchell	Buck Creek
Tom Murtaugh	Commissioner
Tracy Niccum	Buck Creek
Dee Pattengale	Colburn
Debby Parisi	Concerned Citizens
Judy Rubright	Buck Creek
Terry Reaves	Buck Creek
Carol Shepard	Buck Creek
Gary Steinbaugh	Americus
Gini & Ron Tull	Americus
Nick Wagner	Buck Creek/VFD
Kevin Weimert	Buck Creek
Jeannette Welch	Buck Creek
John Whitlock	Buck Creek
Dale Wolfe	Americus

Water Infrastructure Planning Committee Meetings:

- Meeting No. 1: March 14, 2019. Description of a Utility Master Plan, Project Area, overview of the various preliminary alternatives, and discussion.
- Meeting No. 2: May 16, 2019. Description of the Life Cycle Cost Analysis that was performed, presentation of the recommended alternatives with their anticipated costs.

2.3.3 Detailed Analysis and Recommendations

The second step of the process consists of development and detailed analysis of the alternatives for Americus, Buck Creek and Colburn. This results in an implementation plan, which includes the recommendations for resolving the prioritized concerns.

Using this methodology, this UMP has information regarding the existing conditions, pinpoints problem areas, and provides solutions to effectively address drinking water quality and quantity issues, wastewater treatment issues, and stormwater drainage issues for current and future development areas.

2.4 PLAN ORGANIZATION

The Tippecanoe County Utility Master Plan is organized into several chapters, with included tables, figures and appendices. A summary of the chapters is below:

Chapter 2: **Master Plan Overview** – Provides an introduction and purpose of a UMP, along with the planning approach.

Chapter 3: **Project Planning Area** – Describes the existing conditions in the communities with regards to topography, soils, climate, land use, natural drainage systems, water quality and threatened / endangered species.

Chapter 4: **Existing Facilities/Specific Problems**– Describes the existing land use, along with anticipated future land use. Evaluates current drinking water, wastewater, and stormwater management programs and policies.

Chapter 5: **Need for Project** – Evaluates the existing drinking water, wastewater and stormwater infrastructure and describes the known problem areas.

Chapter 6: **Alternatives Considered** – Conducts an initial screening assessment and provides a methodology for detailed analysis of the high priority concerns.

Chapter 7: **Recommended Alternatives** – Provides a final screening assessment and detailed analysis of the high priority concerns, along with basic recommendations for lower priority issues.

3. PROJECT PLANNING AREA

3.1 LOCATION AND BACKGROUND INFORMATION

This master plan is a planning document to address the utility needs in the unincorporated towns of Americus, Buck Creek and Colburn. These communities are all in Washington Township, which is in northeast Tippecanoe County. Washington Township had an estimated population of 2,814 in 2017. Americus is approximately 6 miles from the intersection of the Hoosier Heartland Corridor (SR 25) and Interstate 65. Buck Creek is approximately 5 miles and Colburn is approximately 8 miles from the same intersection.

3.1.1 Location Maps

An overall project planning area map is included as **Figure 1.1** of **Appendix 1**. A map of each town in the project planning area is included in **Appendix 1**; the Americus map is **Figure 1.2**, the Buck Creek map is **Figure 1.3** and the Colburn map is **Figure 1.4**.

3.2 GENERAL CHARACTERISTICS OF THE PLANNING AREA

3.2.1 Climate and Precipitation

Americus, Buck Creek and Colburn experience a climate typical of the lower Midwest. Historical weather data for Lafayette, Indiana was downloaded from the U.S Climate Data website database for a 10-year period (2007-2017). An analysis shows that mean temperatures range from the high-20s in the winter months to the mid-70s in the summer months with occasional daily lows below 10° and daily highs above 90°. The average annual precipitation is approximately 42 inches and generally, precipitation events vary in frequency and intensity year-round.

3.2.2 Land Features

3.2.2.1 Topography

Americus's topography is influenced by its natural drainage systems and has a gently rolling landscape, along with some areas of steep slopes. The steep slopes are located along the Wabash River. The elevation in Americus is approximately 550 feet above sea level.

Buck Creek

Buck Creek's topography is influenced by its natural drainage systems and has a flat to gently rolling landscape. Topography in the town is influenced by Buck Creek. The elevation in Buck creek is approximately 660 feet above sea level.

Colburn

Colburn topography is influenced by its natural drainage systems and has a flat to gently rolling landscape. Topography in Colburn is influenced by Sugar Creek. The elevation in Buck creek is approximately 660 feet above sea level.

A copy of the United States Geological Survey (USGS) Quad map for the area is seen in **Appendix 1** as **Figure 3.1.**

3.2.2.2 Soils

A review of the Web Soil Survey[1] indicates that Americus's predominant soils types are Hononegah and Mahalasville. Soil types can be classified into "hydrologic soil groups" based on their ability to infiltrate water, ranging from "Group A" soils with higher infiltration rates to "Group D" soils with low infiltration rates. These classifications are widely used in hydrologic calculations to determine runoff flow rates and volumes for the sizing of infrastructure to manage storm water. Mahalasville hydrologic soils group is "Group B" and its ability to store water is moderate. Hononegah's hydrologic soils group is "Group A" and its ability to store water is high.

A review of the Web Soil Survey indicates that Buck Creek's predominant soils types are Miami and Miami/Crosby, silt loams. The Miami hydrologic soil group is "Group C". The ability of Miami soil to store water is low. The Miami/Crosby hydrologic soil group is "Group C/D". The ability for it store water is moderate.

A review of the Web Soil Survey indicates that Colburn's predominant soils types are Miami and Washtenaw. The Miami hydrologic soil group is "Group C". The Washtenaw hydrologic soil group is "Group C/D". The ability of Miami soil to store water is low. The ability of Washtenaw soil to store water is moderate.

Soils with higher infiltration rates have lower runoff potential and are better able to support infiltrative storm water BMPs, such as rain gardens and other types of bioretention. Soils with lower infiltration rates are more likely to require BMPs such as detention or retention ponds and other measures that temporarily hold and subsequently release stormwater at a controlled rate. These same soil types are not optimal for septic system installation.

A copy of the USDA NRCS soils map for the study area is included in **Appendix 1** as **Figure 3.2**.

3.2.2.3 Karst Features

Karst features, including surface depressions, sinkholes, caves, fissures and karst springs. Karst features are not common within Washington Township, Tippecanoe County.

3.2.3 Rivers and Streams

Americus is on the bank of the Wabash River. There is a bridge over the Wabash River on Grant Road. The Town of Buck Creek is influenced by Buck Creek that is a tributary to the Wabash River. Colburn is near Sugar Creek. Sugar Creek is a tributary to the Wabash River.

3.2.4 Floodplains

The FIRM maps were reviewed for the planning area. Small portions of Americus along the south overbank of the Wabash River are within the 100-year floodplain. Grant Street marks the division between Zone AE with floodway to the west and approximate Zone A to the east. Buck Creek is located along the north side of the

[1] An online soils database supported by the USDA NRCS http://websoilsurvey.sc.egov.usda.gov/App/HomePage.htm.

Town of Buck Creek, and Sugar Creek is located along the south side of Colburn. The FIRM shows approximate Zone A floodplains for Buck Creek and Sugar Creek. The majority of both towns are outside the delineated 100-year floodplains. Impacts to floodplains and waterways were considered during the development of each alternative.

3.2.5 Wetlands

Wetlands maps were reviewed for the planning area. Americus, Buck Creek and Colburn were the main focus. There are no wetlands within Americus, Buck Creek or Colburn. There are wetlands spread around Washington Township including along some parts of water bodies within the township.

3.2.6 Wellhead Protection Areas

Americus, Buck Creek and Colburn do not have public water supplies. They are not close to another public water supply. None of the communities are in a wellhead protection area.

3.3 Water Quality

The EPA requires States to identify waters that do not meet applicable water quality standards under Section 303(d) of the Clean Water Act (CWA). The State of Indiana has compiled its Section 303(d) list of the status of impaired waters, including causes for impairment such as the presence of pollutants that affect biotic communities or create fish consumption advisories, E. coli or ammonia levels exceeding State limits, and problematic algal growth, among others. In the areas around Americus, Buck Creek and Colburn the water bodies are listed as impaired on the Section 303(d) List. Sugar Creek (Colburn) is impaired for E. coli. Buck Creek (Unnamed Tributary to Buck Creek) is impaired for E. coli and impaired biotic communities. The Wabash River (Americus) is impaired for PCBs and impaired biotic communities.

Water quality standards are important due to the CWA, but are also an important factor in the quality of life for residents. Clean water is vital for the public health and safety, recreational areas, improves property values, and provides an environment for plants and animals. Additional benefits of clean water include lower costs for operations of drinking water facilities and helping create a healthier community.

3.4 Threatened and Endangered Species

There are three federally endangered or federally threatened species listed for Tippecanoe County. These species are the Eastern Massasauga Rattlesnake, the Northern Long Eared Bat and the Indiana Bat. Several more species including different types of vertebrates, invertebrates, and plants are listed as endangered or threatened by the State of Indiana.

Some activities, such as clearing of trees in which the Indiana bat may roost, need to be permitted and can only be conducted during certain times of the year.

3.5 Land Use, Population Trends and Projections

Land use in Washington Township is mainly agricultural. The towns of Americus, Buck Creek and Colburn are the main residential areas of the township. There is very little commercial development in the township including

Americus, Buck Creek and Colburn.

In 2010, Americus population was 423 individuals. Buck Creek had a 2010 population of 207 individuals. In 2010, the Colburn population was 193. There is no population data specific for Americus, Buck Creek and Colburn before 2010. In 2017 the U.S. Census Bureau estimates that Americus had a population of 394; Buck Creek had a population of 166; and Colburn had population of 325.

Americus and Buck Creek have declining populations while Colburn's population is increasing. It would be proper to presume that the population of Washington Township and these towns' populations would remain fairly constant. Significant growth (including commercial) in Americus, Buck Creek and Colburn would be difficult without the presence of utilities.

3.6 Growth Areas

The opportunities for growth are present in Washington Township. The communities of Americus, Buck Creek and Colburn have the potential for growth. The Heartland Corridor has improved traffic flow through the area adding to the potential for growth. Actual growth in Washington Township is being hindered by the lack of utility infrastructure. Access to water of sufficient quality and quantity is a major factor for future growth. A means to effectively dispose of wastewater in larger quantities is also necessary for further growth. Stormwater control is also needed in the towns of Americus, Buck Creek and Colburn. Stormwater control is necessary to promote future growth in Washington Township.

4. EXISTING FACILITIES / SPECIFIC PROBLEMS

4.1 DRINKING WATER

4.1.1 Location Map

There is no public water supply. There are only drinking water wells for individual properties and no map was created to show individual drinking water wells.

4.1.2 Source of Supply

Not applicable because there is no public water supply. There are only drinking water wells for individual properties.

4.1.3 Water Treatment Area (If Applicable)

Not applicable because there is no public water supply. There are only drinking water wells for individual properties.

4.1.4 Water Distribution System

Not applicable because there is no public water supply. There are only drinking water wells for individual properties.

4.1.5 Water Storage System

Not applicable because there is no public water supply. There are only drinking water wells for individual properties.

4.1.6 Hydraulic Analysis

There had been no hydraulic analysis performed on Americus, Buck Creek, and Colburn because all of the communities had private water supply systems for each residence and commercial site. A hydraulic analysis will be performed to determine the appropriate sizing of a public water system for the three communities.

4.1.7 Compliance with Safe Drinking Water Act (SDWA)

The Indiana Department of Environmental Management's (IDEM) maintains public drinking water records. There are public water supply drinking water wells in Americus and Buck Creek, in Americus, there are two business with a public water supply well. One business had an E. coli violation in its well. The other business had a failure to monitor Nitrates violation for its well. In Buck Creek there is one business with a Nitrate violation in its well. These compliance issues with the Safe Drinking Water Act (SDWA) will have to be addressed by the individual business but, they would be eliminated with a public water system.

4.1.8 Water Pumpage

Not applicable because there is no public water supply. There are only drinking water wells for individual properties.

4.1.9 Distribution of Users

The distribution of users are in the areas of concentrated population. The main distribution of users in Washington Township are Americus, Buck Creek and Colburn.

4.1.10 Water Loss

Not applicable because there is no public water supply. There are only drinking water wells for individual properties.

4.1.11 Projected Future Demands

Unknown at this time; however, future concentrated growth will require utilities be present in advance.

4.1.12 Fire Protection Considerations

Not applicable because there is no public water supply. There are only drinking water wells for individual properties.

4.1.13 Current Utility Financial Status

Not applicable because there is no public water supply. There are only drinking water wells for individual properties.

4.2 WASTEWATER

4.2.1 Location Map

Not applicable because there is no public wastewater system. There are only private septic systems.

4.2.2 History

The Tippecanoe County Health Department (TCHD) was consulted on the historical records of septic systems. Pertaining to the community of Americus located on Old State Road 25 North adjacent to the Wabash River, TCHD has 35 records on file for repair and replacements of septic systems in Americus. No records exist for the remaining 28 properties which may drain to the Wabash River using buried tiles or undisclosed discharges.

The community of Buck Creek is located at the intersection of County Road East 450 North and County Road 700 East just south of the Hoosier Heartland Highway. TCHD has 33 records on file for repair and replacement of septic systems in Buck Creek. No records exist for the remaining 64 properties which may drain to Buck Creek using buried tiles or undisclosed discharges.

The community of Colburn is located at the intersection of East County Road 700 North and County Road North 1000 East just off the Hoosier Heartland Highway. TCHD has 27 records on file for repair or replacement of septic systems. No records exist for the remaining 61 properties which may drain to Sugar Creek using buried tiles or undisclosed discharges.

Only 95 properties have records of septic systems out of 271 properties in the three communities.

4.2.3 Present Conditions (Collection System, Treatment System)

The Tippecanoe County Health Department (TCHD) has collected information and data over the past several years pertaining to unincorporated towns of Americus, Buck Creek, and Colburn located in Washington Township which is part of the northeast sector of Tippecanoe County. TCHD has dealt with real estate transactions and permits to repair or replace existing on-site sewage disposal systems in these communities. TCHD files indicate that inappropriate sewage systems design, or lack of any individual sewage disposal systems are the major reason for the sewage disposal problems in these towns. The poor soil condition, density of development, lot size, and configuration, and the use of individual private water wells preclude the possibility of using individual on-site sewage disposal systems as a means of eliminating the existing sewage disposal problem in these locations.

4.2.4 Adequacy of Current Facilities

The lack of a public wastewater system for the communities of Americus, Buck Creek, and Colburn means that the adequacy of wastewater system must be determined on an individual basis. As previously discussed in Section 4.2.2, there are 271 properties in the three communities but there are only 95 records of septic systems in the same area. This means the adequacy of the septic system of 176 properties is undetermined.

As examples of some of the current issues Tippecanoe County Health Department (TCHD) is involved with include a restaurant located in Americus that has a failed septic system and remains on a pump and haul Health Officer's order as the process proceeds for providing an on-site sewage disposal system meeting state and local requirements for installation. Allowing the restaurant to pump and haul has allowed the business to remain open but is expensive to continue during this process. In the community of Buck Creek, TCHD has declared a single-family dwelling to be unfit for human habitation due to failed on-site disposal system and lack of adequate space to repair or replace. The home remains vacant today.

4.3 STORMWATER

Wet weather is unavoidable and effective stormwater management is necessary to protect existing infrastructure and for supporting future development. Various issues, which can include flooding, damage to public and private property, erosion and sedimentation, habitat loss and water quality degradation, are all concerns when evaluating stormwater runoff control strategies to protect the lives of citizens and physical assets of a community. Successful stormwater management serves to mitigate negative impacts and sustain future growth.

4.3.1 Location Map

Not applicable because there is no public storm water system. There are only roadside ditches and private drainage tiles and not a public stormwater system.

4.3.2 History

There is no history for a public storm water system. There are only roadside ditches and private drainage tiles. These methods of stormwater control have always been in use in Americus, Buck Creek, and Colburn.

4.3.3 Present Conditions (Collection System, Treatment System)

The present conditions of the stormwater system consist of ditches, culverts and private stormwater drainage tiles. The present condition of private stormwater tiles is impossible to determine because they are buried on private property and their points of discharge are unknown. The present condition roadside ditches and culverts in Americus, Buck Creek, and Colburn range good to poor. Where the conditions are poor, temporary road and property flooding are noted and have led to complaints from property owners.

4.3.4 Adequacy of Current Facilities

The adequacy of current stormwater facilities in Americus, Buck Creek, and Colburn range from adequate to inadequate. If the properties and roads do not flood during rain events, then the stormwater facilities would be deemed adequate. However, if flooding of roads and properties occurs, then the stormwater facilities for that area would be deemed inadequate. Various areas in each community could be evaluated on an individual basis because there is no true public stormwater system present. Where facilities are inadequate, Tippecanoe County has received complaints about flooding.

5. NEED FOR PROJECT

5.1 HEALTH AND SAFETY

To gain a better understanding of the health and safety concerns of Washington Township, a questionnaire was developed to ask residents if they were having drinking water, wastewater, and stormwater issues. A copy of the questionnaire is included in **Appendix 2**. A map showing the locations of questionnaire responses is located in **Appendix 1** as **Figure 5.1**.

5.1.1 Drinking Water

The properties in Washington Township are served by private water wells. These wells are tested for bacteriological contamination during property transfer or when the property owner has the well tested. Generally, testing results are not shared with the local health department. This makes it difficult to determine the current health and safety concerns with respect to drinking water. Public water supplies (ex. Restaurants) are tested for bacteria and other parameters on a regular basis and that information is public information. The Buck Creek Community Center has a history of high Nitrates above maximum contaminant level (MCL) of 10 mg/l. This data was reviewed and it was determined that there are positive results for bacteria and nitrates. These contaminants can be the result of the presence of sewage. As stated in Section 4.2.3, there is difficulty in making individual septic system repairs in Americus, Buck Creek, and Colburn due to the proximity of wells and septic systems and overall lot size. This only adds to the potential of drinking water well contamination. There were two (2) responses to the questionnaire that expressed concerns about the drinking water at their property.

5.1.2 Wastewater

Individuals living in these communities have voiced concerns regarding the health and safety conditions around or near open ditches and drainage ways and the tile drains that may contain sewage contamination. Several diseases can be contracted from contact with improperly treated sewage such as: Salmonellosis, Shegellosis, Dysentery, Polio, Hepatitis A, Amebiasis, and Giardiasis. Pools of sewage can provide ideal breeding places for mosquitos, most likely to be responsible for the spread of St. Louis Encephalitis and West Nile Virus. There were seven (7) responses to the questionnaire that expressed concerns about sewage disposal at their property. It is critical that the sewage disposal problems in these communities be addressed as soon as possible. Any further delays will:

1. Continue the existence of a public health hazard;
2. Decrease the property values in the area;
3. Hinder further development in the areas; and
4. Increase project costs to the property owners due to inflation and the probability of further reductions in government funding and low cost loans.

5.1.3 Stormwater

There are both health and safety concerns with respect to stormwater. The health concern is that stormwater can be contaminated by wastewater. This can take place in both the open ditches and the private drainage tiles. Stormwater can contain the diseases mentioned in Section 5.1.2 and human contact with the stormwater can

cause illness. The safety concern with stormwater is from flooding. Flooding of roadside ditches can result in automobile accidents. Periodic flooding can also damage property over time and be a safety concern. There were nine (9) responses to the questionnaire that expressed concerns about stormwater transport at their property.

5.2 Regulatory Concerns

5.2.1 Drinking Water

There are regulations to ensure safe drinking water. The Safe Drinking Water Act outlines the quality of water that is necessary to maintain public health. It is much easier to regulate public water supplies but it is more difficult to regulate individual well systems. Often private wells are not tested at all or are only tested for bacteria when the property changes hands. Public facilities are tested for additional parameters but in these communities public facilities do not give a large view of potential regulatory concerns. Group contaminants such as IOCs, VOCs, and SOCs generally are not tested for in transient public water supplies and private residences. Each property would be evaluated and enforced on an individual basis which can be very difficult for the property owners because there is no other drinking water option than an individual well.

5.2.2 Wastewater

There are state codes and local ordinances against sewage disposal in a manner that negatively affects surface waters. Codes and ordinances are in place to prevent public access to wastewater. If wastewater can be contacted by the public on any property in Americus, Buck Creek or Colburn, then this may force the local health department to address health hazards individually through enforcement of state codes and local ordinances, thus adding to the cost and delaying a comprehensive approach to the problem.

5.2.3 Stormwater

There are no regulatory concerns related to stormwater for the property owners of Americus, Buck Creek, and Colburn. However, there are health and safety issues as previously mentioned, note: stormwater system design is not permitted by the Indiana Department of Environmental Management.

5.3 Growth and Future Needs - During the Planning Period

The planning period used for this Utility Master Plan (UMP) is 20 years. The communities of Americus, Buck Creek, and Colburn are not incorporated areas. There was no specific census data for these communities until 2010. The Census Bureau population for 2010 and the estimated 2017 population for each community is included in **Table 5-1**. You can see that the population in Americus and Buck Creek are decreasing while the population of Colburn has increased. The differences in population reflect an overall net increase of 7% over the seven year period or a 1% population increase annually. Taking this into consideration, the UMP will anticipate growth of 20% over the 20-year planning period.

Table 5-1 Population Trend of Communities in Washington Township

Community	2010 Population	2017 Estimated Population
Americus	423	394
Buck Creek	207	166
Colburn	193	325

Note: There is a subdivision east of Americus, Ben La Del Estates that contains 78 homes. Providing utility services to these residences will be evaluated as a part of this utility master plan (UMP). Based on **Table 5-1**, the population of the subdivision is not included in the Americus population.

6. ALTERNATIVES CONSIDERED

6.1 DRINKING WATER

The localized drinking water alternatives considered in this Utility Master Plan (UMP) are the same for the communities of Americus, Buck Creek, and Colburn.

6.1.1 Localized

In these alternatives, supply, treatment and distribution of drinking water within each community will be analyzed.

6.1.1.1 Peak Flow

Providing drinking water for the residents of each community were evaluated in this alternative. A public system was sized and costed for each community. In the peak flow alternative, sizing of the system for fire-flow for hydrants was not considered.

6.1.1.1.1 Distribution

The distribution will be constructed using PVC piping for the mains and services to each property. The water mains will be four inches in diameter and will be constructed in the road right-of-way. If construction is necessary on private property then an easement will be acquired prior to the start of construction.

6.1.1.1.2 Supply

To satisfy the residential and commercial drinking water needs in Americus (including the 78 connections to the east), it was determined that an average daily flow (ADF) of 52,000 gallons per day (gpd) should be supplied. Buck Creek would need a supply of 19,850 gpd and Colburn would need an ADF of 19,500 gpd. To supply a community and to provide redundancy, it was determined that two wells would be considered as a part of this alternative. The wells considered were eight inches in diameter and include all the necessary appurtenances to supply drinking water to the community.

6.1.1.1.3 Treatment

A pre-engineered and self-contained treatment plant that combines aeration, detention and filtration in a single unitized package was determined to be acceptable for Americus, Buck Creek, and Colburn. It provides economical and dependable performance in treating groundwater supplies, and on applications such as: Iron Removal, Radon Removal, Manganese Removal, VOC Removal, Odor Removal, and Removal of Carbon Dioxide, Hydrogen Sulfide, and other dissolved gases. A chlorine storage tank and pump system are included in the treatment system for disinfection of the drinking water.

6.1.1.1.4 Storage

Since there is no fire flow protection as a part of this alternative, storage of drinking water will be sized to contain one day of capacity. A ground storage tank sized for 52,000, 20,000, and 20,000 gallons (respectively) is included for the necessary storage. All electrical controls and a backup generator are included for each water treatment plant in the localized alternatives.

6.1.1.2 Fire Flow

The analysis for Americus, Buck Creek, and Colburn included considering the need for fire protection. The calculations to determine the required fire flow protection were conducted based on ISO standards. The calculations were performed based on the approximate size of the largest home in the communities of Americus, Buck Creek, and Colburn. Through these calculations, it is determined that the required fire flow for the communities are 2,000 gpm for Americus, 1,500 gpm for Buck Creek, and 1,530 gpm for Colburn. According to the 2018 International Fire Code, the needed duration for Americus is two hours and the duration for Buck Creek and Colburn is one hour.

6.1.1.2.1 Distribution

The distribution will be constructed using PVC piping for the water mains and services to each property. To provide drinking water service and fire flow protection for Americus, the water mains will be ten-inches in diameter and will be constructed in the road right-of-way. To provide drinking water service and fire flow protection for Buck Creek, the water mains will be eight inches in diameter and will be constructed in the road right-of-way. To provide drinking water service and fire flow protection for Colburn, the water mains will be eight-inches in diameter and will be constructed in the road right-of-way. The distribution system will include fire hydrants to help prevent loss of property in case of fire within the community. If construction is necessary on private property then an easement will be acquired prior to the start of construction.

6.1.1.2.2 Supply

To satisfy the residential and commercial drinking water needs in Americus, it was determined that 52,000 gallons per day (gpd) should be supplied. Buck Creek would need a supply of 19,850 gpd and Colburn would need a supply of 19,500 gpd. To supply a community and to provide redundancy, it was determined that four wells would be considered as a part of this alternative. The wells considered were eight inches in diameter and include all the necessary appurtenances to supply drinking to the community.

6.1.1.2.3 Treatment

A pre-engineered and self-contained treatment plant that combines aeration, detention and filtration in a single unitized package was determined to be acceptable for Americus, Buck Creek, and Colburn. It provides economical and dependable performance in treating groundwater supplies, and on applications such as: Iron Removal, Radon Removal, Manganese Removal, VOC Removal, Odor Removal, and Removal of Carbon Dioxide, Hydrogen Sulfide, and other dissolved gases. A chlorine storage tank and pump system are included in the treatment system for disinfection of the drinking water.

6.1.1.2.4 Storage

As discussed previously, it was determined that 2,000 gpm for two hours, 1,530 and 1,000 gpm for one hour is necessary for each community for fire flow. Americus requires storage of 310,000 gallons for fire flow. Buck Creek requires 210,000 gallons and Colburn requires storage of 120,000 gallons for fire flow. A water tower in each community for storage of fire flow is included as a part of this alternative.

6.1.2 Centralized

In these alternatives, distribution systems for each community with transport from one location containing supply and treatment will be analyzed.

6.1.2.1 Peak Flow

Providing drinking water for the residents of each community were evaluated in this alternative. A public system was sized and costed for each community without the consideration of fire-flow for hydrants to prevent damage to property in the communities from fire.

6.1.2.1.1 Distribution

The distribution system in each community will be constructed using PVC piping for the mains and services to each property. The water mains will be four inches in diameter and will be constructed in the road right-of-way. If construction is necessary on private property then an easement will be acquired prior to the start of construction. The drinking water transport conveyance water main from the water treatment plant to the communities are as described below (see **Figure 6.4**).

- Conveyance main to Americus distribution system from the water treatment plant (WTP) is 1,300 lineal feet (lf).
- Combined conveyance water main from the WTP for Buck Creek and Colburn is 1,360 lf.
- Conveyance water main from the combined conveyance water main to Buck Creek is 11,580 lf.
- Conveyance water main from the combined conveyance main to Colburn is 11,750 lf.

6.1.2.1.2 Supply

To satisfy the residential and commercial drinking water needs in Americus, Buck Creek, and Colburn it was determined that average daily flow (ADF) 91,350 gallons per day (gpd) should be supplied. To supply a community and to provide redundancy, it was determined that two wells would be considered as a part of this alternative. The wells considered were twelve inches in diameter and include all the necessary appurtenances to supply drinking to the community. In the centralized alternatives the wells will be located near Americus.

6.1.2.1.3 Treatment

A pre-engineered and self-contained treatment plant that combines aeration, detention and filtration in a single unitized package was determined to be acceptable for Americus, Buck Creek, and Colburn. It provides economical and dependable performance in treating groundwater supplies, and on applications such as: Iron Removal, Radon Removal, Manganese Removal, VOC Removal, Odor Removal, and Removal of Carbon Dioxide, Hydrogen Sulfide, and other dissolved gases. A chlorine storage tank and pump system are included in the treatment system for disinfection of the drinking water. In the centralized alternatives the water treatment plant will be located near Americus.

6.1.2.1.4 Storage

Since there is no fire flow protection as a part of this alternative, storage of drinking water will be sized to contain one day of capacity for the three communities. A ground storage tank sized for 125,000 gallons is included for the necessary storage. All electrical controls and a backup generator are included for the water treatment plant in the centralized alternatives.

6.1.2.2 Fire Flow

The analysis for Americus, Buck Creek, and Colburn included considering the need for fire protection. The calculations to determine the required fire flow protection were conducted based on ISO standards. The calculations were performed based on the approximate size of the largest home in the communities of

Americus, Buck Creek, and Colburn. Through these calculations, it is determined that the required fire flow for the communities are 2,000 gpm for Americus, 1,530 gpm for Buck Creek, and 1,500 gpm for Colburn. According to the 2018 International Fire Code, the needed duration for Americus is two hours and the duration for Buck Creek and Colburn is one hour. The fire flow protection calculations are attached in **Appendix 3**.

6.1.2.2.1 Distribution

The distribution will be constructed using PVC piping for the mains and services to each property. To provide drinking water service and fire flow protection for Americus, the water mains will be ten inches in diameter and will be constructed in the road right-of-way. To provide drinking water service and fire flow protection for Buck Creek, the water mains will be eight inches in diameter and will be constructed in the road right-of-way. To provide drinking water service and fire flow protection for Colburn, the water mains will be six inches in diameter and will be constructed in the road right-of-way. The distribution system will include fire hydrants to help prevent loss of property in case of fire within the community. If construction is necessary on private property then an easement will be acquired prior to the start of construction. The drinking water transport conveyance water mains from the water treatment plant to the communities are as described below (see **Figure 6.4**).

- Conveyance water main to Americus distribution system is 1,300 lineal feet (lf).
- Combined conveyance water main from the water treatment plant for Buck Creek and Colburn is 1,360 lf.
- Conveyance water main from the combined force main to Buck Creek is 11,580 lf.
- Conveyance main from the combined conveyance water main to Colburn is 11,750 lf.

6.1.2.2.2 Supply

To satisfy the residential and commercial drinking water needs in Americus, Buck Creek, and Colburn it was determined that ADF 91,350 gallons per day (gpd) should be supplied. To supply a community and to provide redundancy, it was determined that four wells would be considered as a part of this alternative. The wells considered were twelve inches in diameter and include all the necessary appurtenances to supply drinking to the community. In the centralized alternatives the wells will be located near Americus.

6.1.2.2.3 Treatment

A pre-engineered and self-contained treatment plant that combines aeration, detention and filtration in a single unitized package was determined to be acceptable for Americus, Buck Creek, and Colburn. It provides economical and dependable performance in treating groundwater supplies, and on applications such as: Iron Removal, Radon Removal, Manganese Removal, VOC Removal, Odor Removal, and Removal of Carbon Dioxide, Hydrogen Sulfide, and other dissolved gases. A chlorine storage tank and pump system are included in the treatment system for disinfection of the drinking water. In the centralized alternatives the water treatment plant will be located near Americus.

6.1.2.2.4 Storage

As discussed previously, it was determined that 1,500 gpm for one hour is necessary for each community for fire flow. Americus requires storage of 310,000 gallons for fire flow. Buck Creek requires storage of 210,000 gallons for fire flow and Colburn requires storage of 120,000 gallons.

6.1.3 Regionalized

In these alternatives, distribution systems for each community with transport of drinking water from either Delphi or Lafayette will be analyzed. Both regionalized alternatives are sized for fire flow as described below.

The analysis for Americus, Buck Creek, and Colburn included considering the need for fire protection. The calculations to determine the required fire flow protection were conducted based on ISO standards. The calculations were performed based on the approximate size of the largest home in the communities of Americus, Buck Creek, and Colburn. Through these calculations, it is determined that the required fire flow for the communities are 2,000 gpm for Americus, 1,530 gpm for Buck Creek, and 1,500 gpm for Colburn. According to the 2018 International Fire Code, the needed duration for Americus is two hours and the duration for Buck Creek and Colburn is one hour. The fire flow protection calculations are attached in **Appendix 3**.

6.1.3.1 Delphi

6.1.3.1.1 Distribution

The distribution will be constructed using PVC piping for the mains and services to each property. To provide drinking water service and fire flow protection for Americus, the water mains will be ten inches in diameter and will be constructed in the road right-of-way. To provide drinking water service and fire flow protection for Buck Creek, the water mains will be eight inches in diameter and will be constructed in the road right-of-way. To provide drinking water service and fire flow protection for Colburn, the water mains will be eight inches in diameter and will be constructed in the road right-of-way. The distribution system will include fire hydrants to help prevent loss of property in case of fire within the community. If construction is necessary on private property then an easement will be acquired prior to the start of construction. The drinking water transport conveyance water mains from the water treatment plant to the communities are as described below.
(see **Figure 6.5**)

- Conveyance water main from Delphi to junction of conveyance water main to each community is 29,600 lineal feet (lf).
- Conveyance water main from junction to the Americus distribution system is 1,300 lf.
- Combined conveyance water main to Buck Creek and Colburn is 1,360 lf.
- Conveyance water main from junction to the Buck Creek distribution system is 11,580 lf.
- Conveyance water main from junction to the Colburn distribution system is 11,750 lf.

6.1.3.1.2 Supply

In this regionalized alternative, supply of drinking water will be from Delphi.

6.1.3.1.3 Treatment

In this regionalized alternative, treatment of drinking water will be in Delphi.

6.1.3.1.4 Storage

In this regionalized alternative, storage of drinking water will be in Delphi.

6.1.3.2 Lafayette

6.1.3.2.1 Distribution

The distribution will be constructed using PVC piping for the mains and services to each property. To provide drinking water service and fire flow protection for Americus, the water mains will be ten inches in diameter and will be constructed in the road right-of-way. To provide drinking water service and fire flow protection for Buck Creek, the water mains will be eight inches in diameter and will be constructed in the road right-of-way. To provide drinking water service and fire flow protection for Colburn, the water mains will be eight inches in diameter and will be constructed in the road right-of-way. The distribution system will include fire hydrants to help prevent loss of property in case of fire within the community. If construction is necessary on private property then an easement will be acquired prior to the start of construction. The drinking water transport conveyance water mains from the water treatment plant to the communities are as described below. (see **Figure 6.5**)

- Conveyance water main from Lafayette to Buck Creek is 33,600 lineal feet (lf).
- Combined conveyance water main from Buck Creek to the junction is 11,580 lf.
- Conveyance water main from junction to the Americus distribution system is 2,500 lf.
- Conveyance water main from junction to the Colburn distribution system is 11,750 lf.

6.1.3.2.2 Supply

In this regionalized alternative, supply of drinking water will be from Lafayette.

6.1.3.2.3 Treatment

In this regionalized alternative, treatment of drinking water will be in Lafayette.

6.1.3.2.4 Storage

In this regionalized alternative, storage of drinking water will be in Lafayette.

6.1.4 Design Criteria

6.1.4.1 Localized

To satisfy the residential and commercial drinking water needs in Americus, it was determined that an ADF of 52,000 gallons per day (gpd) should be supplied, treated, and distributed. Buck Creek would need a supply of 19,850 gpd and Colburn would need a supply of 19,500 gpd. These flows would also require treatment and distribution.

6.1.4.2 Centralized

The supply, treatment, and distribution systems within the centralized alternatives is sized for 271 connections and 91,350 gpd and is located in Americus.

6.1.4.3 Regionalized

The distribution system within the regionalized alternatives is sized for 271 connections and 91,350 gpd with supply and treatment of drinking water in either Delphi or Lafayette.

6.1.5 Layout Map

All layout maps are located in **Appendix A**.

6.1.5.1 Localized

The Americus map showing the localized alternatives is **Figure 6.1**. The Buck Creek map showing the localized alternatives is **Figure 6.2**. The Colburn map showing the localized alternatives is **Figure 6.3**.

6.1.5.2 Centralized

The map showing the centralized alternatives is **Figure 6.4**.

6.1.5.3 Regionalized

The map showing the regionalized alternatives is **Figure 6.5**.

6.1.6 Environmental Impacts

Environmental impacts for the evaluated alternatives are all similar. There will be impacts related to excavation and water main installation – noise, dust, and erosion. Similar issues will result from the construction of the treatment and disposal systems. Environmental impacts could be minimized if directional drilling installation instead of the open cut method (less expensive). Another environmental impact is in the construction of the water treatment plant. The construction of the water treatment plant will also impact the environment due to excavation and upon operation chlorine handling could impact adversely impact the environment.

6.1.7 Land Requirements

The distribution systems of all alternatives will be constructed in the rights-of-way. Land acquisition will be required for the well field and water treatment plant. For all alternatives it was determined that the land requirements for well field and water treatment plant is three acres. Existing public roadways right-of-way must be investigated further to confirm if the proposed utility infrastructure can be installed.

6.1.8 Construction Problems

The main construction problems for localized, centralized, and regionalized alternatives are all the same. Traffic control is a main problem because the majority of the construction will take place in road rights-of-way. The other main construction problem is land acquisition that is necessary for well field and water treatment plant construction. Easements may also be necessary in some areas for distribution system piping.

6.1.9 Cost Estimates

A summary of the total project costs for all the drinking water alternatives is included below in **Table 6-1**.

Table 6-1 Summary of Drinking Water Total Project Costs

Location of System	Component of System	Peak Flow Alternatives			Fire Flow Alternatives		
		Alternative #1 Peak Flow	Alternative Total Cost	Total Life Cycle Cost	Alternative #2 Fire Flow	Alternative Total Cost	Total Life Cycle Cost
Localized - Americus	Distribution	Water Mains	$4,382,300	$5,496,547	Water Mains	$7,413,400	$8,004,446
	WTP	Package Plant			Package Plant		
	Supply	2 Wells			4 Wells		
Localized - Buck Creek	Distribution	Water Mains	$3,280,300	$4,715,539	Water Mains	$5,551,900	$6,231,939
	WTP	Package Plant			Package Plant		
	Supply	2 Wells			4 Wells		
Localized - Colburn	Distribution	Water Mains	$3,302,200	$4,520,477	Water Mains	$5,096,700	$6,078,901
	WTP	Package Plant			Package Plant		
	Supply	2 Wells			4 Wells		
Total			$10,964,800	$14,732,563		$18,062,000.	$20,315,286
Centralized - Americus	Distribution	Water Mains	**$12,533,800**	$12,015,056	Water Mains	$19,444,400	$17,528,261
	WTP	Package Plant			Package Plant		
	Supply	2 Wells			4 Wells		
Regionalized - Delphi	Distribution	N/A	N/A	N/A	Water Mains	$19,613,000	$19,233,340
	Conveyance				Delphi		
Regionalized - Lafayette	Distribution	N/A	N/A	N/A	Water Mains	$20,443,100	$18,242,537
	Conveyance				Lafayette		

Note: Bold price indicates the Recommended Alternative.

Detailed cost estimates for all drinking water alternatives are included in **Appendix 4.**

6.1.10 Advantages / Disadvantages

6.1.10.1 Localized

It can be advantageous for each community to have its own supply, treatment and distribution systems to supply safe drinking water to the community and spur development. The main disadvantage is that a regional district would have three separate supply, treatment and distribution systems to maintain. Another disadvantage would be the traffic disruption caused by the construction.

6.1.10.2 Centralized

In the centralized alternatives, it is advantageous for each community to have its own distribution system and only one supply and treatment system for the regional district to maintain. The main disadvantage would be traffic disruption during construction.

6.1.10.3 Regionalized

In the regionalized alternative the main advantage, not mentioned above, would be no supply and treatment systems to operate and maintain. All drinking water would be received from either Delphi or Lafayette for distribution and consumption. In the regionalized alternatives, the main disadvantage would be traffic disruption during construction and less control of potential usage costs.

6.2 WASTEWATER

6.2.1 Localized

In these alternatives, collection, treatment and disposal of wastewater within each community will be analyzed.

6.2.1.1 New Collection System for each Community

6.2.1.1.1 Septic Tank Effluent Pump (STEP) System

A STEP system will remove the majority of solids in the waste stream prior to being discharged into the collection system. The tanks can be maintained by the resident by pumping them out when necessary or they can be maintained by the utility. This system includes each dwelling's individual septic system preliminarily treating the wastewater before being pumped to the wastewater treatment infrastructure. Since the septic system will provide preliminary treatment, the equalization tank associated with

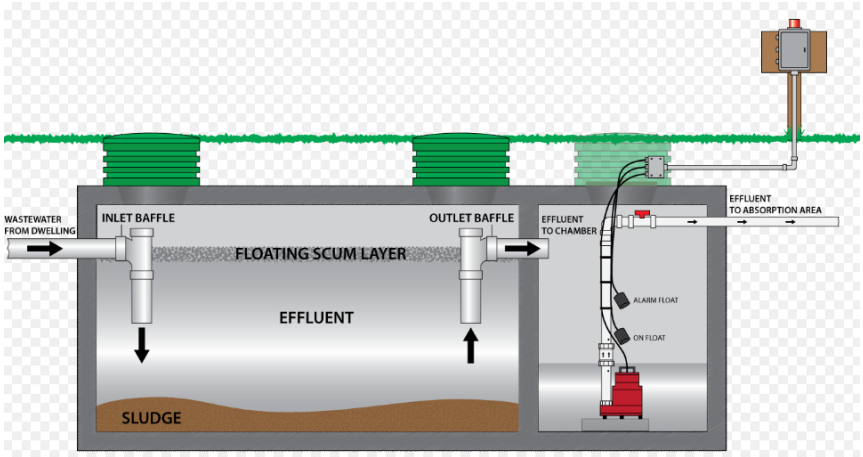


Figure 6.6 Septic Tank Effluent Pump System

this system will only be required to provide one day of detention. An example of a STEP system can be viewed in **Figure 6.6**.

- **Advantages**: low capital cost, smaller equalization tank, property owner's familiarity with septic tanks, relatively long useful life expectancy for pumps, potential to share a septic tank to reduce costs
- **Disadvantages**: maintenance necessary for septic tank and pumps, electrical power necessary for each pump, potential disruption in service during power outages

6.2.1.1.2 Grinder Pump System

This system includes grinder pumps replacing the septic tanks and receiving waste from one or two properties. The waste from the properties will flow to the grinder pump by gravity. When the wastewater in the pump reaches a certain level, the grinder pump will turn on, grinding the waste into a slurry which will then be pumped to the wastewater treatment infrastructure through a low pressure force main, generally no larger than four inches in diameter. Since no preliminary treatment will be provided by the grinder pumps, equalization tanks must provide three days of detention. The layout of the grinder pumping system is identical to the layout of the STEP collection system, except for the enlarged equalization tanks. An example of a grinder pump can be viewed in **Figure 6.7**.

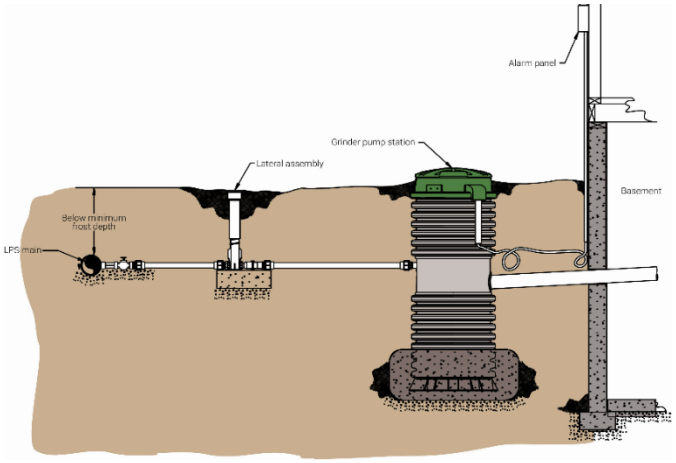


Figure 6.7 Grinder Pump by E-One

- **Advantages**: low capital cost, no septic tanks to maintain, potential to share a grinder pump to reduce costs
- **Disadvantages**: lower useful life expectancy for pumps, pumps are more expensive than STEP pumps to replace, electrical power necessary for each pump, potential upgrade needed for each home's electrical, potential disruption of service during power outages

6.2.1.2 Wastewater Treatment Plant (WWTP) for each Community

6.2.1.2.1 Recirculating Media Filter (RMF)

A recirculating media filter (RMF) pumps wastewater to the filter which is full of media (sand, gravel, etc.). Treatment occurs below grade as the fluid trickles down through the pore spaces of the media where aerobic organisms feed on the nutrients. The wastewater is recirculated to ensure sufficient treatment. An RMF would treat the wastewater after it is pumped to the plant site. An example of a RMF can be viewed in **Figure 6.8**. The RMF would be placed upstream of the series of elevated sand mounds.

- **Advantages:** potential for meeting low effluent limits, low energy consumption, no sludge wasting in aerobic process

- **Disadvantages:** similar capital cost to package plant, maintenance required to keep vegetation from growing on top of the filter

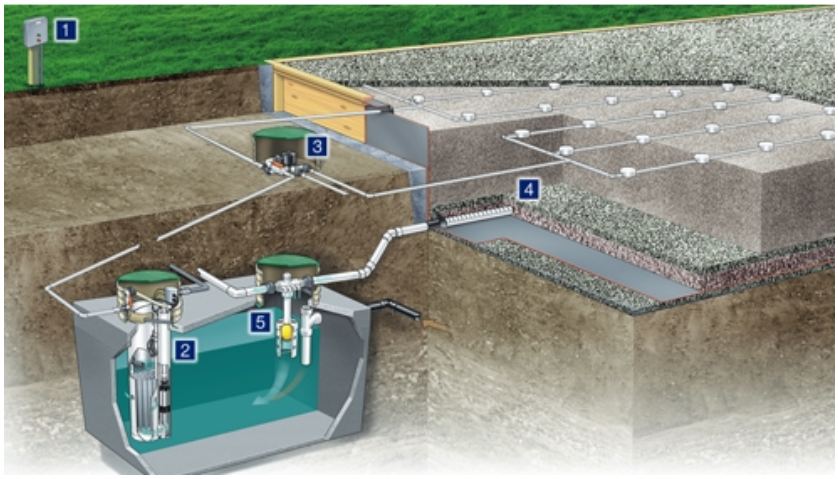


Figure 6.8 Recirculating Media Filter Treatment System

6.2.1.2.2 Package Plant System

Package Plant: The package plant is a biomechanical treatment plant on a smaller scale. The system includes extended aeration, clarification and sludge digestion. The layout of the package plant can be viewed in **Figure 6.9**. The treated effluent will be directly discharged to surface water. Since the effluent will be directly discharged to a waterbody, disinfection will be necessary. After the wastewater leaves the clarifier (see **Figure 6.9**), it will then pass through a UV system to be disinfected before being discharged to water body.

- **Advantages:** potential for meeting low effluent limits, modular for expansion if necessary
- **Disadvantages:** higher capital costs than RMFs, higher operational cost than RMF, biological sludge disposal required

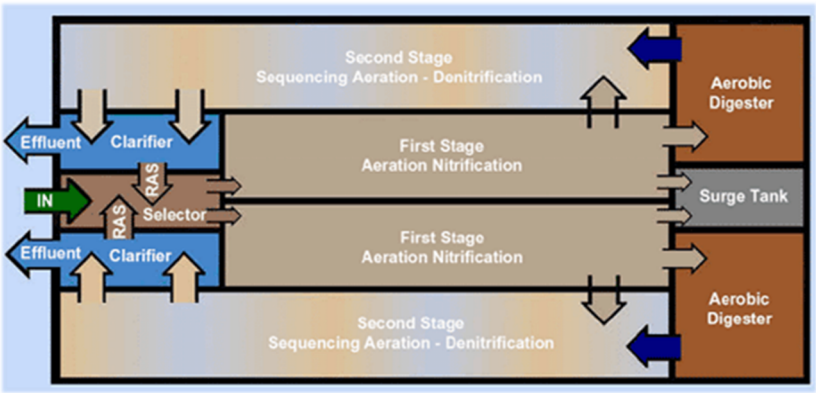


Figure 6.9 Package Plant Treatment System

6.2.1.3 Discharge for each WWTP

6.2.1.3.1 Direct Discharge to a Water Body

Wastewater discharge from the package plant system will be to a water body in each community. The package plant system for Americus will discharge to the Wabash River. For Buck Creek the package plant system will discharge to an unnamed tributary of Buck Creek. Colburn's package plant system will discharge to Little Sugar Creek. Each package plant system will require an NPDES permit from the Indiana Department of Environmental Management (IDEM) with all associated reporting to IDEM.

6.2.1.3.2 Onsite System

6.2.1.3.2.1 Americus: Drip Irrigation System

If the recirculating media filter (RMF) is selected for treatment, then the discharge would be to the soil. An open area near Americus was selected to research for soil discharge of treated wastewater. The soils map (**Figure 6.10** in **Appendix A**) was reviewed for the selected open area. The soils in the selected area are Hononegah Fine Sandy Loam (HoA) and Sleeth Loam (SmA). These soils are not limiting for soil discharge of treated wastewater. These soils do not have a low loading rate and perimeter drains would be preferred but would not be mandatory. For these reasons, this site is a good location for a drip irrigation field and would be used in Americus.

6.2.1.3.2.2 Buck Creek: Mound System

If the recirculating media filter (RMF) is selected for treatment, then the discharge would be to the soil. An open area near Buck Creek was selected to research for soil discharge of treated wastewater. The soils map (**Figure 6.11** in **Appendix A**) was reviewed for the selected open area. The soils in the selected area are Crosby Silt Loam (CtA) and Crosby-Miami Silt Loam (CwB2). These soils are very limiting for soil discharge of treated wastewater. These soils do have a low loading rate and a perimeter drain would be required. For these reasons, an elevated sand mound is preferred for this open area in Buck Creek. A schematic of an elevated sand mound is included below in **Figure 6.12.**

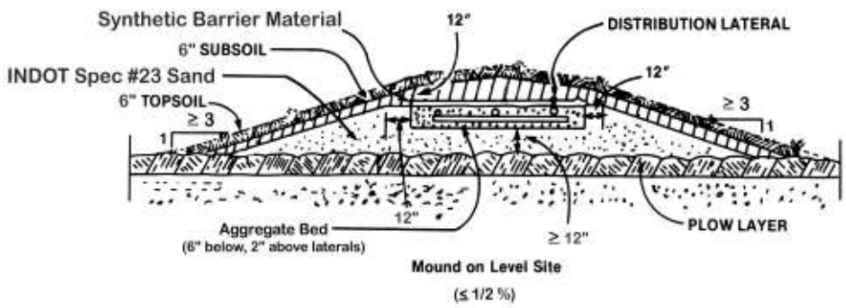


Figure 6.12. Example Elevated Sand Mound from ISDH Design Manual

6.2.1.3.2.3 Colburn: Mound System

If the recirculating media filter (RMF) is selected for treatment, then the discharge would be to the soil. An open area near Buck Creek was selected to research for soil discharge of treated wastewater. The soils map (**Figure 6.13** of **Appendix A**) was reviewed for the selected open area. The soils in the selected area are Miami-Clay Loam (MtC3) and Rockfield Silt Loam (RoB). Miami-Clay Loam is very limiting for soil discharge of treated wastewater. These soils do have a low loading rate and perimeter drain would be required. For these reasons, an elevated sand mound is preferred for this open area in Colburn.

6.2.2 Centralized

In these alternatives, collection systems for each community with transport to one location for treatment and disposal will be analyzed.

6.2.2.1 <u>New Collection System for each Community</u>

6.2.2.1.1 Septic Tank Effluent Pump (STEP) System

A STEP system will remove the majority of solids in the waste stream prior to being discharged into the collection system. The tanks can be maintained by the resident by pumping them out when necessary or they

can be maintained by the utility. This system includes each dwelling's individual septic system preliminarily treating the wastewater before being pumped to the wastewater treatment infrastructure. Since the septic system will provide preliminary treatment, the equalization tank associated with this system will only be required to provide one day of detention. An example of a STEP system can be viewed in **Figure 6.6**.

- **Advantages**: low capital cost, smaller equalization tank, property owners familiarity with septic tanks, relatively long useful life expectancy for pumps, potential to share a septic tank to reduce costs
- **Disadvantages**: maintenance necessary for septic tank and pumps, electrical power necessary for each pump, potential disruption in service during power outages

6.2.2.1.2 Grinder Pump System

This system includes grinder pumps replacing the septic tanks and receiving waste from one or two properties. The waste from the properties will flow to the grinder pump by gravity. When the wastewater in the pump reaches a certain level, the grinder pump will turn on, grinding the waste into a slurry which will then be pumped to the wastewater treatment infrastructure through a low pressure force main, generally no larger than four inches in diameter. Since no preliminary treatment will be provided by the grinder pumps, the equalization tanks must provide three days of detention. The layout of the grinder pumping system is identical to the layout of the STEP collection system, except for the enlarged equalization tanks. An example of a grinder pump can be viewed in **Figure 6.7**.

- **Advantages**: low capital cost, no septic tanks to maintain, potential to share a grinder pump to reduce costs
- **Disadvantages**: lower useful life expectancy for pumps, pumps are more expensive than STEP pumps to replace, electrical power necessary for each pump, potential upgrade needed for each home's electrical, potential disruption of service during power outages

6.2.2.2 Conveyance System from Buck Creek and Colburn to Americus

The centralized system requires transport of all wastewater flows from Buck Creek and Colburn to Americus. The force main from Buck Creek is 11,400 lineal feet (lf) and the force main from Colburn is 11,620 lf to the point where the force mains join. The combined force main is 4,730 lf to the wastewater treatment plant.

6.2.2.3 One Wastewater Treatment Plant (WWTP) for all Three Communities Located at Americus

6.2.2.3.1 Recirculating Media Filter (RMF)

A recirculating media filter (RMF) pumps wastewater to the filter which is full of media (sand, gravel, etc.). Treatment occurs below grade as the fluid trickles down through the pore spaces of the media where aerobic organisms feed on the nutrients. The wastewater is recirculated to ensure sufficient treatment. An RMF would treat the wastewater after it is pumped to the plant site. An example of a RMF can be viewed in **Figure 6.8**. The RMF would be placed upstream of the series of elevated sand mounds.

- **Advantages:** potential for meeting low effluent limits, and low energy consumption compared with other technologies, no sludge wasting in aerobic process
- **Disadvantages:** similar capital cost to package plant, maintenance required to keep vegetation from growing on top of the filter

6.2.2.3.2 Package Plant System

Package Plant: The package plant is a biomechanical treatment plant on a smaller scale. The system includes extended aeration, clarification and sludge digestion. The layout of the package plant can be viewed in **Figure 6.9**. The treated effluent will be directly discharged to surface water. Since the effluent will be directly discharged to a waterbody, disinfection will be necessary. After the wastewater leaves the clarifier (see **Figure 6.9**), it will then pass through a UV system to be disinfected before being discharged to water body.

- **Advantages:** potential for meeting low effluent limits, modular for expansion if necessary
- **Disadvantages:** higher capital costs than RMFs, higher operational cost than RMF, biological sludge disposal required

6.2.2.4 Discharge for the WWTP at Americus

6.2.2.4.1 Direct Discharge to Wabash River

The discharge of the centralized system sized for all the flows from Americus, Buck Creek and Colburn (77,530 gpd) will be located near Americus. The package plant system near Americus will discharge to the Wabash River.

6.2.2.4.2 Onsite Drip Irrigation System

If the recirculating media filter (RMF) is selected for treatment for the centralized system, then the discharge would be to the soil. An open area near Americus was selected to research for soil discharge of the centralized system. The soils map (**Figure 6.10** in **Appendix A**) was reviewed for the selected open area. The soils in the selected area are Hononegah Fine Sandy Loam (HoA) and Sleeth Loam (SmA). These soils are not limiting for soil discharge of treated wastewater. These soils do not have a low loading rate and perimeter drain would be preferred but would not be mandatory. For these reasons, this site is a good location for a drip irrigation field and would be used in Americus.

6.2.3 Regionalized

In these alternatives, collection systems for each community with transport to either Delphi or Lafayette for treatment and disposal will be analyzed.

6.2.3.1 New Collection System for each Community

6.2.3.1.1 Septic Tank Effluent Pump (STEP) System

A STEP system will remove the majority of solids in the waste stream prior to being discharged into the collection system. The tanks can be maintained by the resident by pumping them out when necessary or they can be maintained by the utility. This system includes each dwelling's individual septic system preliminarily treating the wastewater before being pumped to the wastewater treatment infrastructure. Since the septic system will provide preliminary treatment, the equalization tank associated with this system will only be required to provide one day of detention. An example of a STEP system can be viewed in **Figure 6.6**.

- **Advantages**: low capital cost, smaller equalization tank, property owners familiarity with septic tanks, relatively long useful life expectancy for pumps, potential to share a septic tank to reduce costs
- **Disadvantages**: maintenance necessary for septic tank and pumps, electrical power necessary for each pump, potential disruption in service during power outages

6.2.3.1.2 Grinder Pump System

This system includes grinder pumps replacing the septic tanks and receiving waste from one or two properties. The waste from the properties will flow to the grinder pump by gravity. When the wastewater in the pump reaches a certain level, the grinder pump will turn on, grinding the waste into a slurry which will then be pumped to the wastewater treatment infrastructure through a low pressure force main, generally no larger than four inches in diameter. Since no preliminary treatment will be provided by the grinder pumps, the equalization tanks must provide three days of detention. The layout of the grinder pumping system is identical to the layout of the STEP collection system, except for the enlarged equalization tanks. An example of a grinder pump can be viewed in **Figure 6.7**.

- **Advantages**: low capital cost, no septic tanks to maintain, potential to share a grinder pump to reduce costs
- **Disadvantages**: lower useful life expectancy for pumps, pumps are more expensive than STEP pumps to replace, electrical power necessary for each pump, potential upgrade needed for each home's electrical, potential disruption of service during power outages

6.2.3.2 Conveyance System from Americus, Buck Creek and Colburn to

6.2.3.2.1 Delphi

The capacity of the Delphi WWTP was analyzed. The average effluent flow is 0.552 MGD while the permitted average daily flow is 1.5 MGD. Currently, the Delphi WWTP is at 36.8% of its capacity. Since there is capacity available this alternative was developed. To deliver flows to Delphi both a pump station and force main are required. The force main from Americus to the junction with the Buck Creek force main is 4,730 lineal feet (lf) while the Buck Creek force main to the junction is 11,400 lf. The force main from the junction point to Colburn is 11,620 lf. A new pump station will be constructed at Colburn in order to pump wastewater flows to Delphi for treatment and disposal; a force main (1,555 lf) will be constructed from the Colburn collection system to the new pump station. A force main of 26,290 lf will deliver the wastewater to Delphi.

6.2.3.2.2 Lafayette

The capacity of the Lafayette WWTP was analyzed. The average effluent flow is 18.58 MGD while the permitted average daily flow is 26.0 MGD. Currently, the Lafayette WWTP is at 71.5% of its capacity. Since there is capacity available this alternative was developed. To deliver flows to Lafayette both a pump station and force main are required. The force main from Americus to the junction with the Colburn force main is 4,730 lineal feet (lf) while the Colburn force main to the junction is 11,620 lf. The force main from Buck Creek to the junction point of the force mains is 670 lf. A new pump station will be constructed at Buck Creek in order to pump wastewater flows to Lafayette for treatment and disposal. A force main of 53,715 lf will deliver the wastewater to Lafayette.

6.2.4 Design Criteria

6.2.4.1 Localized

The localized systems design criteria includes the collection of wastewater from 142 connections in Americus. The treatment and disposal of 45,330 gallons per day (gpd). The design must meet requirements as set forth by the Indiana Department of Environmental Management (IDEM). The localized system design criteria includes the collection of wastewater from 64 connections, treatment and disposal of 16,600 gpd in Buck Creek. The localized

system design criteria includes the collection of wastewater from 65 connections, treatment and disposal of 15,600 gpd in Colburn.

6.2.4.2 Centralized

The collection, treatment, and disposal systems within the centralized alternative is sized for 271 connections and 77,530 gpd in Americus.

6.2.4.3 Regionalized

The collection, treatment, and transport systems within the regionalized alternative is sized for 271 connections and 77,530 gpd for delivery to either Delphi or Lafayette for treatment and disposal.

6.2.5 Layout Map

All layout maps are located in **Appendix A**.

6.2.5.1 Localized

The localized system layout with 142 connections for Americus can be viewed in **Figure 6.14.** The localized system layout with 64 connections for Buck Creek can be viewed in **Figure 6.15**. The localized system layout with 65 connections for Colburn can be viewed in **Figure 6.16**.

6.2.5.2 Centralized

The centralized system layout with 271 connections with treatment and disposal in Americus can be viewed in **Figure 6.17.**

6.2.5.3 Regionalized

The regionalized system layout with 271 connections with transport to either Delphi or Lafayette for treatment and disposal can be viewed in **Figure 6.18.**

6.2.6 Environmental Impacts

Environmental impacts for the evaluated alternatives are all similar. There will be impacts related to excavation and pipe installation – noise, dust, and erosion. Similar issues will result from the construction of the treatment and disposal systems. Environmental impacts could be minimized if directional drilling installation instead of the open cut method (less expensive).

6.2.7 Land Requirements

6.2.7.1 Localized

The collection systems in the towns of Americus, Buck Creek, and Colburn will be constructed in the rights-of-way. Land must be acquired near each town for the treatment and disposal systems (4 acres each).

6.2.7.2 Centralized

The collection systems in the towns of Americus, Buck Creek, and Colburn will be constructed in the rights-of-way. Land must be acquired near Americus for the treatment and disposal systems (11 acres).

6.2.7.3 Regionalized

The collection systems in the towns of Americus, Buck Creek, and Colburn will be constructed in the rights-of-way. The transport system to either Delphi or Lafayette will be constructed in the rights-of-way. There will be no additional land necessary for these alternatives. Existing public roadways right-of-way must be investigated further to confirm if the proposed utility infrastructure can be installed.

6.2.8 Construction Problems

The main construction problems for localized, centralized, and regionalized alternatives are all the same. Traffic control is a main problem because the majority of the construction will take place in road rights-of-way. The other main construction problem is land acquisition if necessary for onsite disposal of the treated wastewater. Easements may also be necessary in some areas for collection system or transport piping.

6.2.9 Cost Estimates

A summary of the total project costs for all the drinking water alternatives is included below in **Table 6-2**.

Table 6-2 Summary of Wastewater Total Project Costs

Location of System	Component of System	Alternative #1	Alternative Total Cost	Total Life Cycle Cost	Alternative #2	Alternative Total Cost	Total Life Cycle Cost
Localized - Americus	Collection	STEP	$4,647,600	$6,282,546	Grinder	$4,541,000	$6,745,432
	WWTP	RMF			Package Plant		
	Discharge	Drip			Direct Discharge		
Localized - Buck Creek	Collection	STEP	$2,980,700	$4,214,182	Grinder	$2,656,000	$4,221,969
	WWTP	RMF			Package Plant		
	Discharge	Mound			Direct Discharge		
Localized - Colburn	Collection	STEP	$2,956,500	$4,273,536	Grinder	$2,632,100	$4,185,776
	WWTP	RMF			Package Plant		
	Discharge	Mound			Direct Discharge		
Total			$10,584,800	$14,770,264		$9,829,100	$15,153,177
Centralized - Americus	Collection	STEP	$10,655,800	$13,360,038	Grinder	**$8,971,500**	**$12,656,568**
	WWTP	RMF			Package Plant		
	Discharge	Drip			Direct Discharge		
Regionalized	Collection	STEP	$10,020,200	$13,411,129	Grinder	$9,725,000	$13,300,034
	Conveyance	Delphi			Delphi		
Regionalized	Collection	STEP	$12,411,400	$16,704,270	Grinder	$12,024,900	$16,338,917
	Conveyance	Lafayette			Lafayette		

Note: Bold price indicates the Recommended Alternative: Centralized Treatment System, Grinder Collection System.

Detailed cost estimates for all wastewater alternatives are included in **Appendix 4.**

6.2.10 Advantages / Disadvantages

6.2.10.1 Localized

It can be advantageous for each community to have its own collection and treatment system to alleviate its wastewater disposal problem. A disadvantage is that a regional district would have three separate treatment and disposal systems to maintain. Another disadvantage would be the traffic disruption caused by the construction.

6.2.10.2 Centralized

In the centralized alternatives, it is advantageous for each community to have its own collection system and only one treatment and disposal system for the regional district to maintain. A disadvantage would be traffic disruption during construction.

6.2.10.3 Regionalized

In the regionalized alternative the main advantage, not mentioned above, would be no treatment and disposal systems to operate and maintain. All wastewater would be pumped to either Delphi or Lafayette for treatment and disposal. In the regionalized alternatives, a disadvantage would be traffic disruption during construction.

6.3 STORMWATER

6.3.1 Description

6.3.1.1 Localized

In these alternatives, collection, and discharge of storm water within each community will be analyzed.

6.3.1.1.1 Americus

6.3.1.1.1.1 Storm Sewer Improvements

To improve drainage in Americus, a new storm sewer will be installed along the south side of Old State Road 25 from the east end of town to the existing storm sewer at Washington Street. A new storm sewer will be installed to replace the existing storm sewer and open culvert along Washington Street from Old State Road 25 to the Wabash River. This storm sewer will consist of 160 lineal feet (lf) of 12-inch sewer; 400 lf of 30-inch sewer; 400 feet of 36-inch sewer; and one 36-inch pipe end section. The project will also include eight stormwater inlets, three manholes

6.3.1.1.1.2 Culvert and Ditch Improvements

The ditches along Americus Court and Old State Road 25 in Americus do not drain optimally. These ditches will be regraded to drain away from Americus and toward the drainage along Washington Street and to the Wabash River or another drainage way. The culverts in these areas will be replaced to allow for the free flow of stormwater. The ditch improvements will total 7,700 lf and the culvert replacements will total 1,500 lf.

6.3.1.1.2 Buck Creek

6.3.1.1.2.1 Storm Sewer Improvements

The existing drainage way from the farmland south of the railroad and southwest of Buck Creek through the western part of the town and discharges north of Madison Street causes localized flooding. This portion of the storm sewer project in Buck Creek will enclose the drainage way and replace the culvert under the intersection of Sherman and North Streets with storm sewer. To further improve drainage in Buck Creek, storm sewers and catch basins will be added to Railroad, Main, Keen, North, and Ferret Streets. There will be two main storm sewer trunk lines in Buck Creek (East & West). The east trunkline storm sewer would consist of: 400 feet of 36-inch sewer, 400 feet of 30-inch sewer, 120 feet of 12-inch sewer, 3 manholes, 6 inlets, and 1 36-inch end section. The west trunkline storm sewer would consist of: 775 feet of 36-inch sewer, 340 feet of 24-inch sewer, 470 feet of 18-inch sewer, 180 feet of 12-inch sewer, 9 manholes, 9 inlets, and 1 36-inch end section.

6.3.1.1.2.2 Culvert and Ditch Improvements

The ditches along Ruffing, Railroad, Madison, North and Ferret Streets in Buck Creek do not drain optimally. These ditches will be regraded to drain away from Buck Creek and toward the nearest drainage way. Culverts along these streets will be cleaned or replaced with an appropriately sized culvert to allow free flow of stormwater. The ditch improvements will total 10,700 lf and the culvert replacements will total 2,150 lf.

6.3.1.1.3 Colburn

6.3.1.1.3.1 Storm Sewer Improvements

There are no known storm sewers in Colburn; consequently, no storm sewer improvements are recommended for Colburn.

6.3.1.1.3.2 Culvert and Ditch Improvements

The ditches along county roads 1000 E and 700 N in Colburn do not drain optimally. These ditches will be regraded to drain away from Colburn and toward Little Sugar Creek, Sugar Creek or another drainage way. Culverts along these roads will be cleaned or replaced with an appropriately sized culvert to allow free flow of stormwater. The ditch improvements will total 6,550 lf and the culvert replacements will total 1,300 lf.

6.3.1.2 Centralized

There are no centralized stormwater systems in this Utility Master Plan.

6.3.1.3 Regionalized

There are no regionalized stormwater systems in this Utility Master Plan.

6.3.2 Design Criteria

Storm sewers designed for Americus and Buck Creek would be sized to transport flows from a 10-year storm event. Roadside ditches would be graded to provide positive slope toward the existing. Existing culverts would be cleaned where possible to allow unimpeded flow of stormwater. Where culverts do not exist or could not be cleaned, a new culvert will be installed to allow for the free flow of stormwater.

6.3.3 Layout Map

All figures are located in **Appendix A**.

6.3.3.1 *Americus*

The localized stormwater alternatives for Americus are depicted in **Figure 6.19**.

6.3.3.2 *Buck Creek*

The localized stormwater alternatives for Buck Creek are depicted in **Figure 6.20**.

6.3.3.3 *Colburn*

The localized stormwater alternatives for Colburn are depicted in **Figure 6.21**.

6.3.4 Environmental Impacts

Environmental impacts for the evaluated alternatives are all similar. There will be impacts related to excavation and pipe installation – noise, dust, and erosion. Environmental impacts could be minimized if directional drilling installation of storm sewer instead of the open cut method (less expensive).

6.3.5 Construction Problems

The main construction problems for the localized alternatives are all the same. Traffic control is a main problem because the majority of the construction will take place in road rights-of-way. The other main construction problem is land acquisition if necessary for the outlet of the storm sewer system (Buck Creek).

6.3.6 Cost Estimates

A summary of the total project costs for all the stormwater alternatives is included below in **Table 6-3**.

Table 6-3 Stormwater Alternatives Project Costs

Alternative	Cost
Buck Creek Ditch Alternative	$671,400
Buck Creek Sewer Alternative	$736,300
Americus Ditch Alternative	$493,000
Americus Sewer Alternative	$258,400
Colburn Ditch Alternative	$421,700
Total	**$2,580,800**

Detailed cost estimates for all stormwater alternatives are included in **Appendix 4.**

6.3.7 Advantages / Disadvantages

The existing stormwater systems Americus, Buck Creek, and Colburn are insufficient. It can be advantageous for each community to have improved stormwater system to alleviate its flooding problem. The main disadvantage would be the traffic disruption caused by the construction.

7. RECOMMENDED ALTERNATIVE

Prior to undertaking the recommended alternative, Tippecanoe County must form a regional utility district to operate and maintain any facilities constructed.

7.1 DRINKING WATER

The centralized peak flow alternative does not have the lowest project cost at **$12,533,800** (Localized Peak Flow Alternatives **$10,964,800**) as outlined in **Table 6-1**. However, the centralized peak flow alternative has the lowest Life Cycle Cost of: **$12,015,056**. The recommended alternative is depicted in **Figure 6.4** in **Appendix 1**.

The centralized peak flow alternative will provide a drinking water supply of 91,350 gallons per day (gpd). The components of recommended alternative are included below.

- Four inch water mains in each community to distribute the water;
- Conveyance water mains to transport drinking water from the water treatment plant to the communities;
- Two 8-inch wells to supply water;
- A package treatment plant to treat 91,350 gpd; and
- A ground storage tank sized for 125,000 gallons for the necessary storage

The implementation schedule for the recommended drinking water alternative will be determined as this project develops.

7.2 WASTEWATER

The centralized wastewater system alternative has the lowest project cost at **$8,971,500** as outlined in **Table 6-3**. The centralized wastewater system alternative has the lowest Life Cycle Cost of: **$12,656,568**. The recommended alternative is depicted in
Figure 6.17 in **Appendix 1**.

The collection, treatment, and disposal systems within the centralized alternative is sized for 271 connections and 77,530 gpd with treatment and disposal near Americus. The components of recommended alternative are included below.

- Grinder pump collection system within each community that transports wastewater to the wastewater treatment plant (WWTP);
- A package treatment plant to treat 77,530 gpd while meeting discharge limits; and
- Discharge of treated wastewater to the Wabash River

The implementation schedule for the recommended wastewater alternative is included in **Table 7-1**.

Table 7-1 Centralized Package Plant Alternative Implementation Schedule

Task	Estimated Completion Time
Regional District Formation	Month 0 to Month 15
Preliminary Engineering Report	Month 15 to Month 17
Funding Procurement	Month 17 to Month 23
Design	Month 23 to Month 28
Construction Permit Application	Month 28 to Month 31
Easement Acquisition	Month 25 to Month 31
Bidding Phase	Month 31 to Month 32
Loan Closing	Month 32 to Month 35
Contract Award	Month 34 to Month 35
Initiation of Construction	Month 37 to Month 39
Construction Phase	Month 39 to Month 63
Final Completion of Construction	Month 63 to Month 64

7.3 STORMWATER

The stormwater alternatives were evaluated in Section 6.3. It was determined that based on the needs to prevent flooding and responses from the questionnaire that all stormwater alternatives should be implemented. The total of all stormwater alternatives cost **$2,580,800**. The stormwater alternatives can be seen in **Figures 6.19**, **6.20**, and **6.21** in **Appendix 1**.

The implementation schedule for the recommended stormwater alternative will be determined as this project develops.

APPENDIX 1: FIGURES

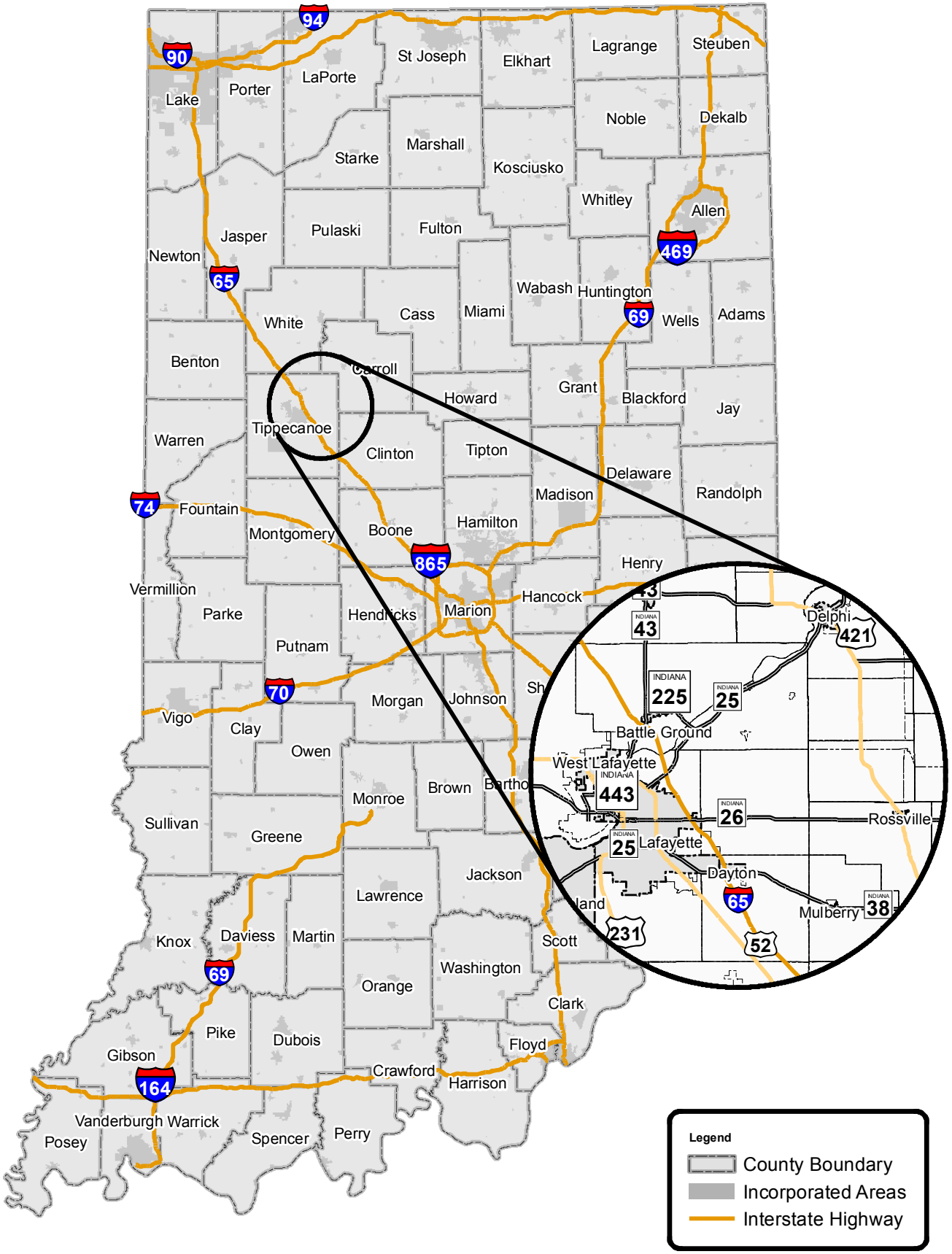
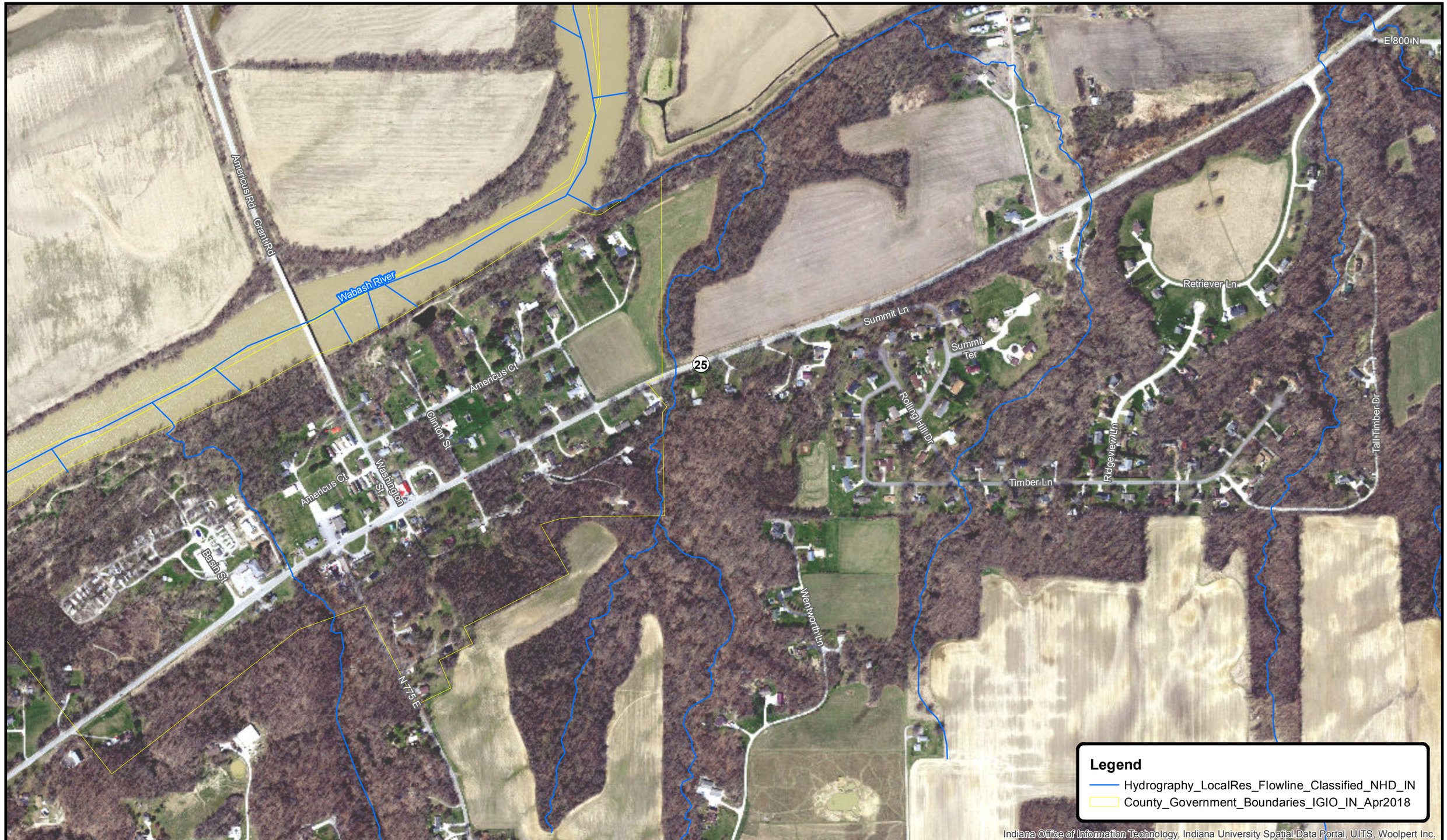


Figure 1.1
Location Map
Tippecanoe County, Indiana

0 12.5 25 50 Miles

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880



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Feet

Figure 1.2
Americus Map
Tippecanoe County, Indiana

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Figure 1.3
Buck Creek Map
Tippecanoe County, Indiana

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Figure 1.4
Colburn Map
Tippecanoe County, Indiana

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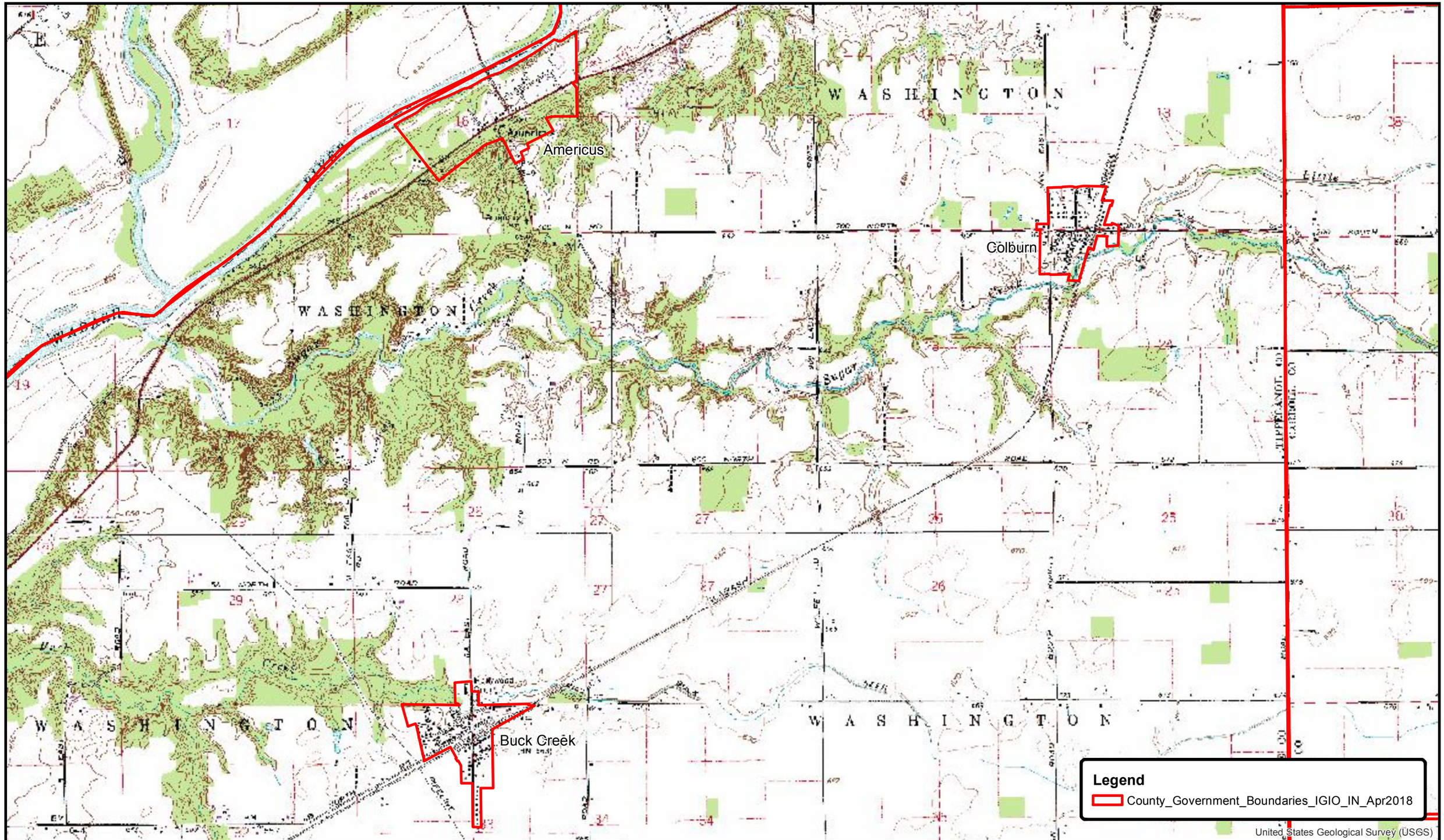

0 1,000 2,000 4,000 Feet

Figure 3.1
USGS Quadrangle Map
Tippecanoe County, Indiana

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Indianapolis, IN 46268
Phone: (317) 222-3880

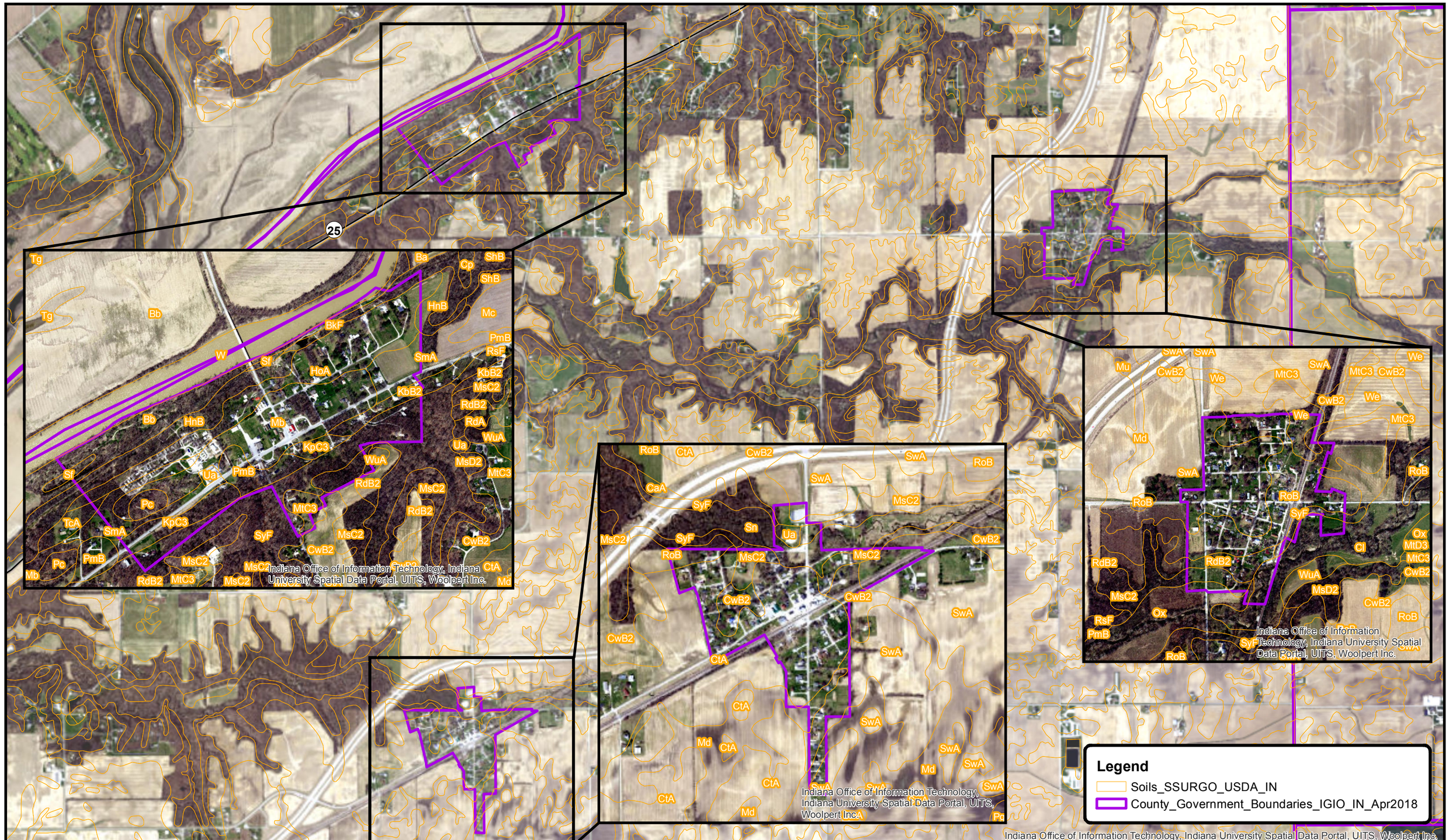

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Figure 3.2
USGS USDA NRCS Soils Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880

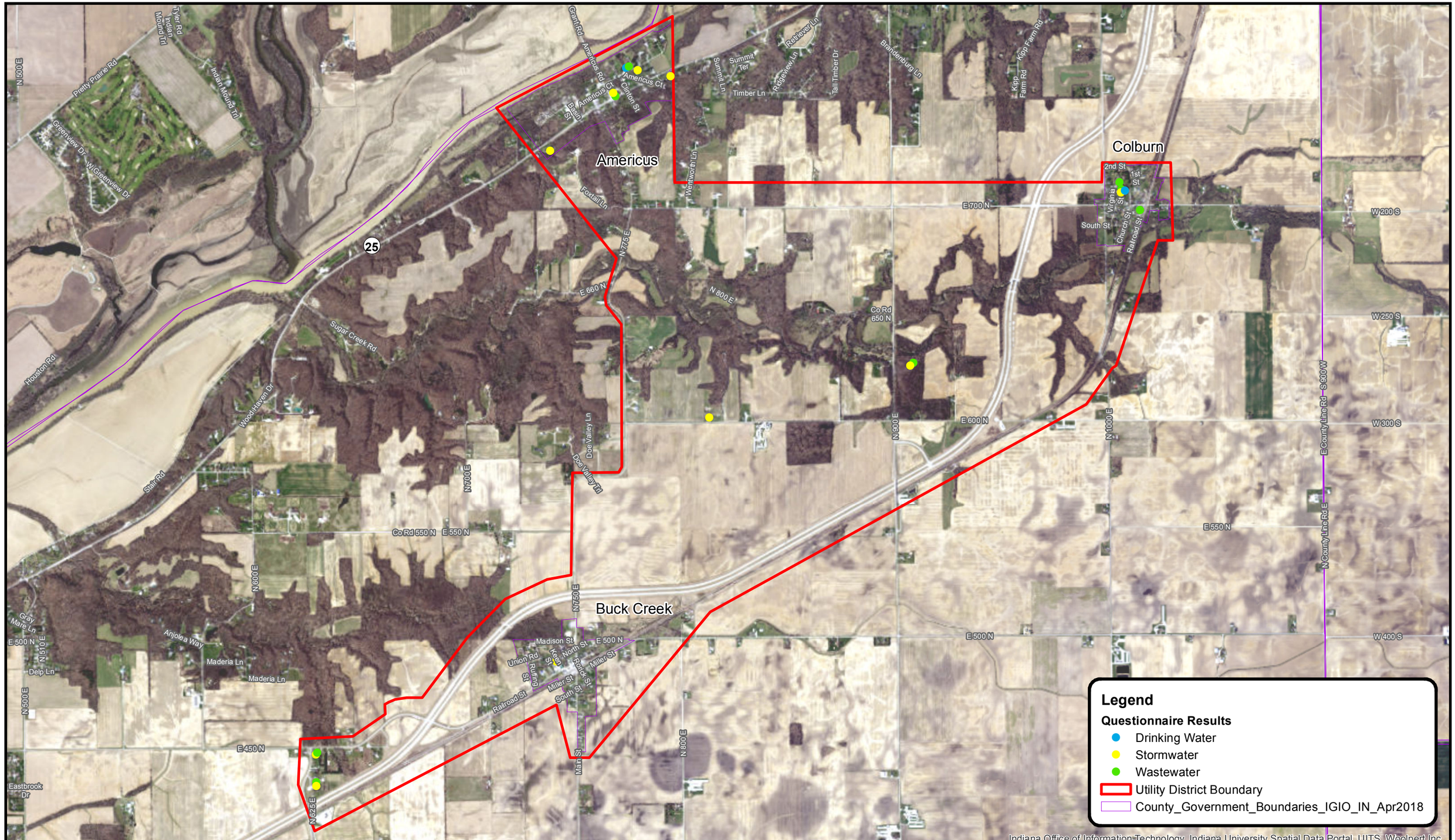

Figure 5.1
Questionnaire Results Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880

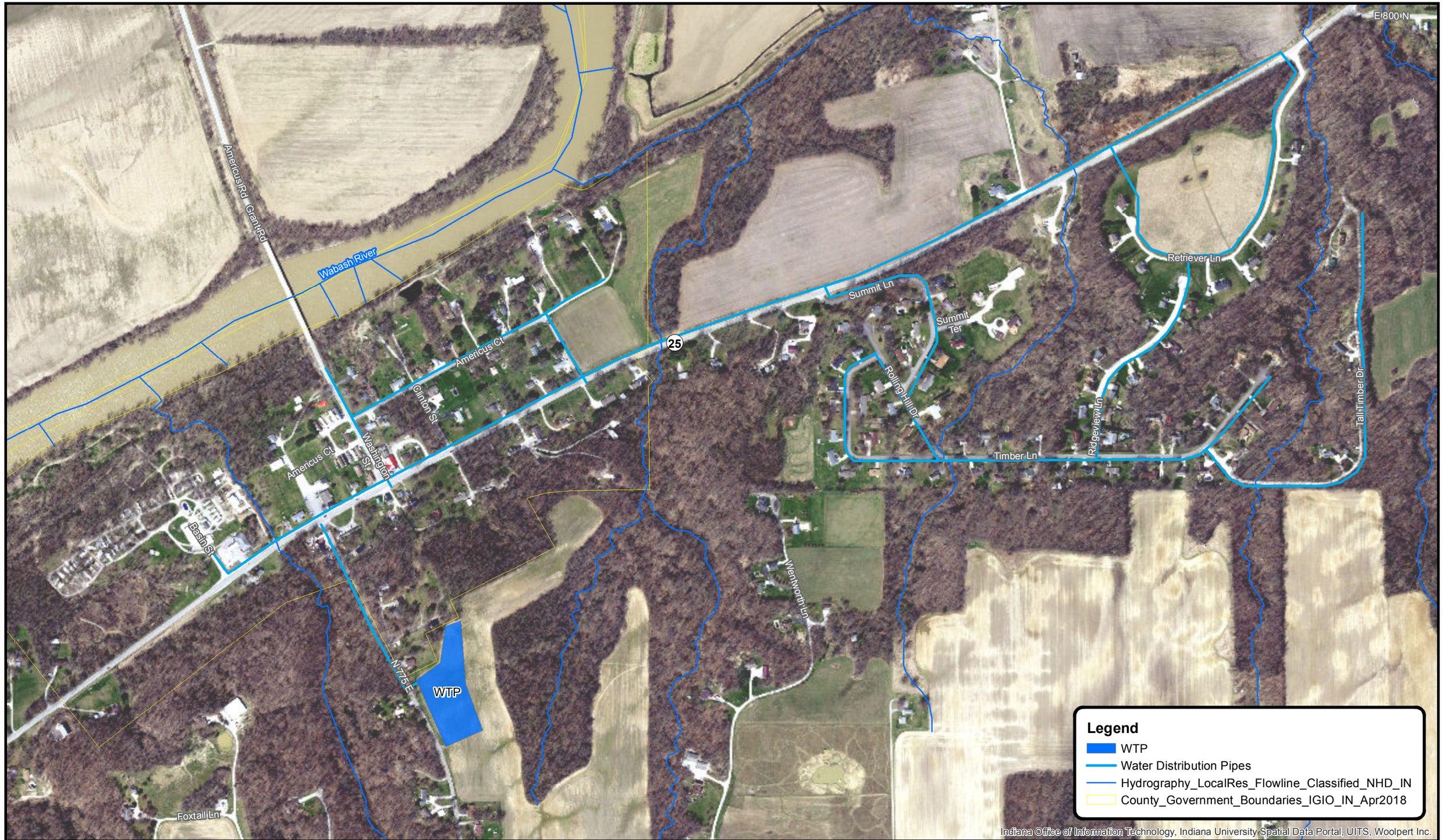

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Figure 6.1
Americus - Localized Drinking Water Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880

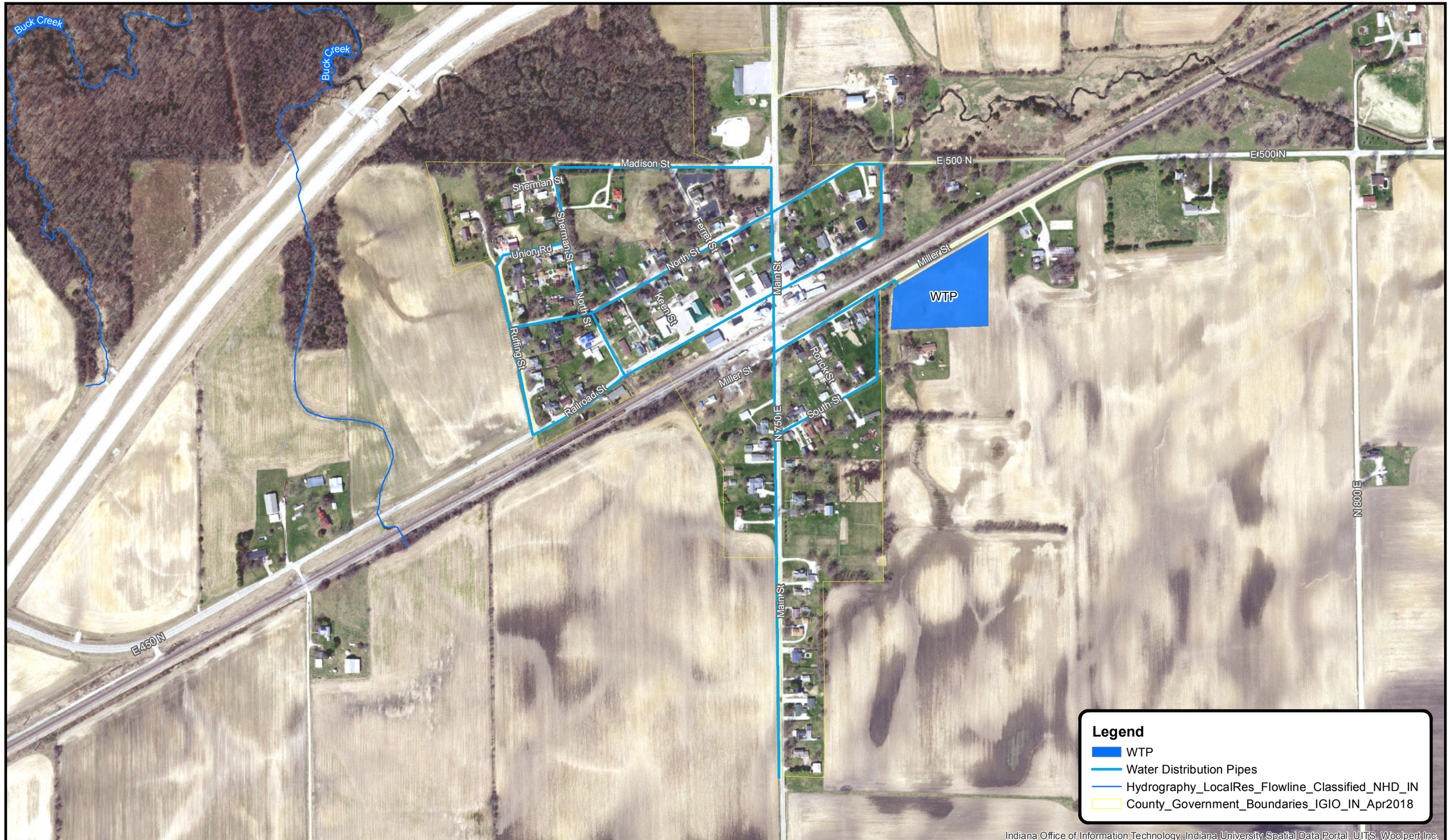

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Figure 6.2
Buck Creek - Localized Drinking Water Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880

N
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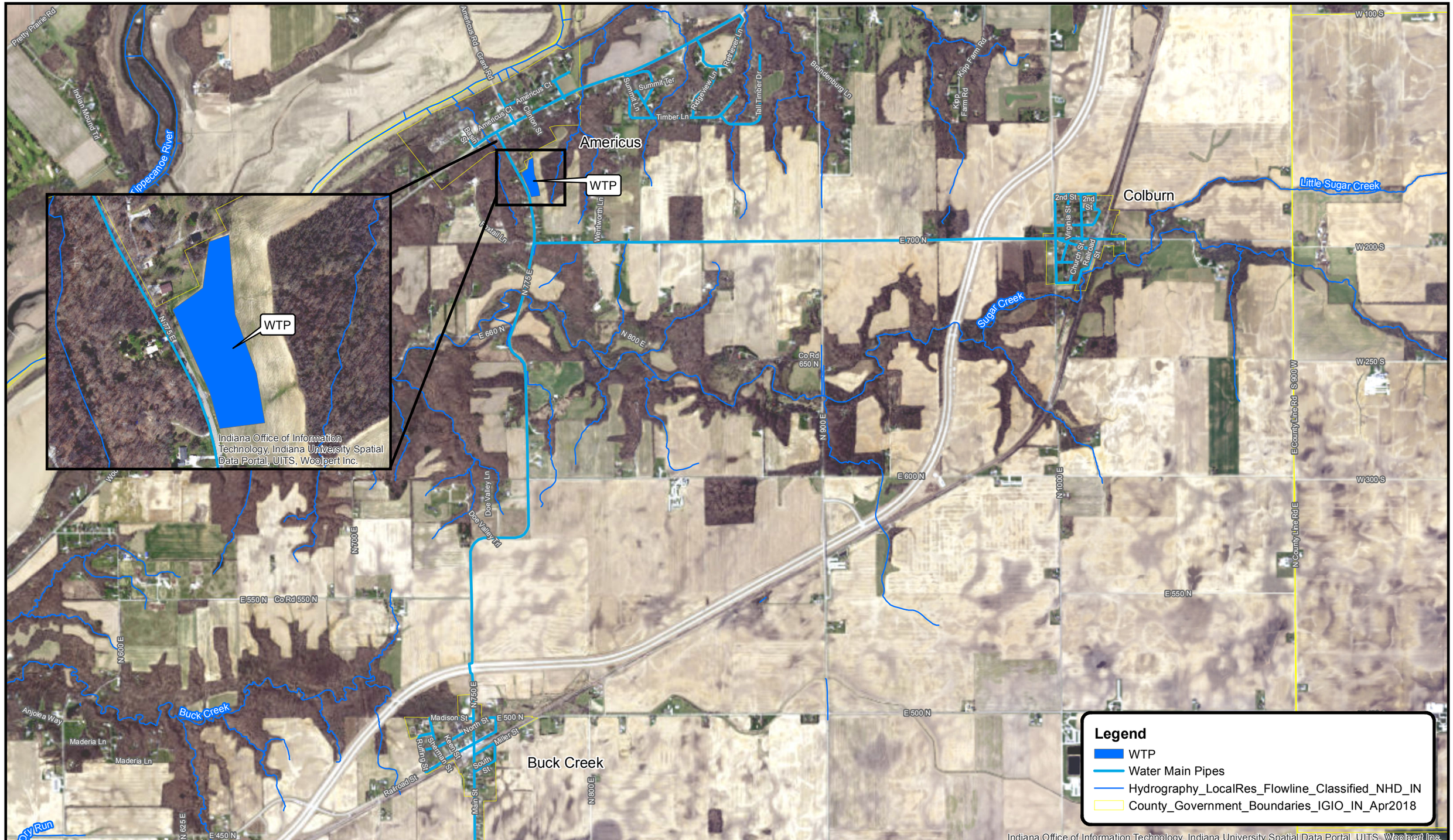
Feet

Figure 6.3
Colburn - Localized Drinking Water Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880



0 1,000 2,000 4,000 Feet

Figure 6.4
Centralized - Drinking Water Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880

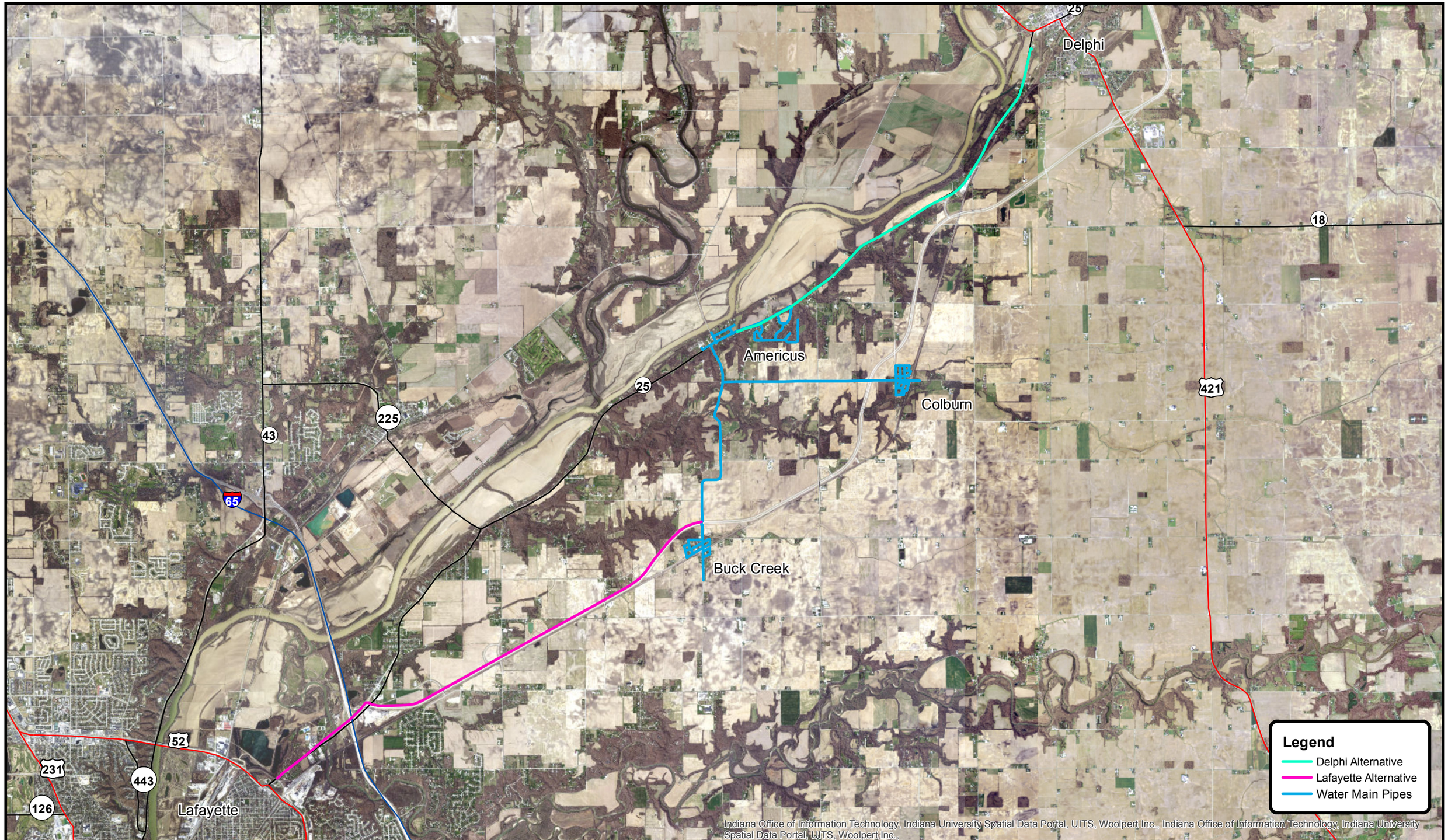


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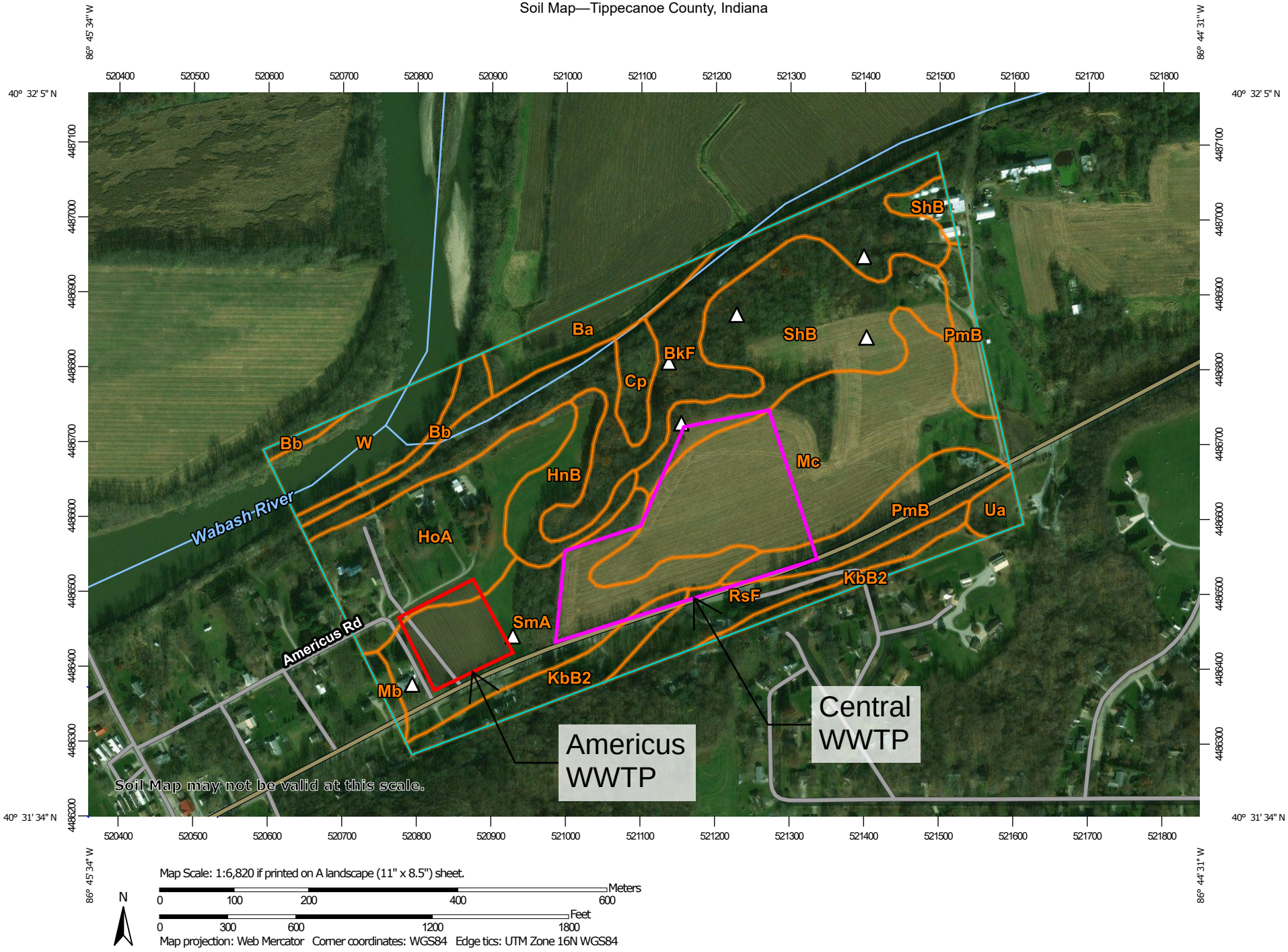
Figure 6.5
Regionalized - Drinking Water Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880

Figure 6.10
Americus WWTP

Soil Map—Tippecanoe County, Indiana



Map Scale: 1:6,820 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 300 600 1200 1800

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

- Soil Map Unit Polygons
- Soil Map Unit Lines
- Soil Map Unit Points

Special Point Features

- Blowout
- Borrow Pit
- Clay Spot
- Closed Depression
- Gravel Pit
- Gravelly Spot
- Landfill
- Lava Flow
- Marsh or swamp
- Mine or Quarry
- Miscellaneous Water
- Perennial Water
- Rock Outcrop
- Saline Spot
- Sandy Spot
- Severely Eroded Spot
- Sinkhole
- Slide or Slip
- Sodic Spot
- Spoil Area
- Stony Spot
- Very Stony Spot
- Wet Spot
- Other
- Special Line Features

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Tippecanoe County, Indiana
Survey Area Data: Version 20, Sep 7, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 7, 2010—Dec 26, 2016

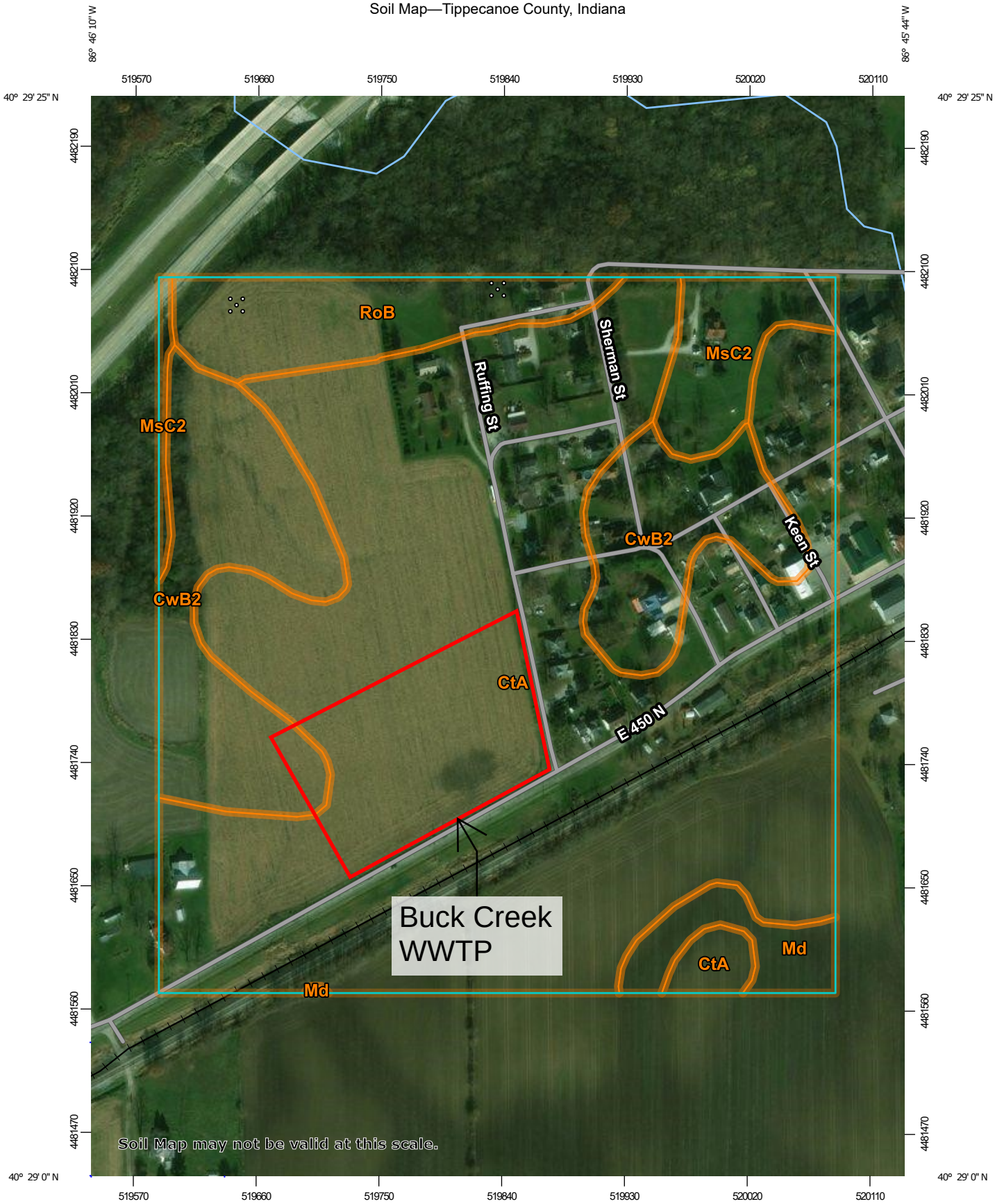
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Ba	Battleground silt loam, protected	3.6	3.3%
Bb	Battleground silt loam, frequently flooded	2.1	1.9%
BkF	Berks channery silt loam, 25 to 60 percent slopes	16.7	15.1%
Cp	Cohoctah loam, gravelly substratum, occasionally flooded	1.7	1.5%
HnB	Hononegah loamy sand, 2 to 6 percent slopes	3.8	3.5%
HoA	Hononegah fine sandy loam, 0 to 2 percent slopes	11.9	10.8%
KbB2	Kalamazoo silt loam, 2 to 6 percent slopes, eroded	5.1	4.6%
Mb	Mahalasville silty clay loam, gravelly substratum	0.6	0.5%
Mc	Mahalasville silty clay loam, shale substratum	19.8	17.9%
PmB	Pinevillage gravelly sandy loam, 2 to 8 percent slopes, rarely flooded	7.0	6.3%
RsF	Rodman gravelly loam, 25 to 60 percent slopes	4.5	4.0%
ShB	Shadeland silt loam, 1 to 4 percent slopes	14.1	12.8%
SmA	Sleeth loam, 0 to 2 percent slopes	13.3	12.0%
Ua	Udorthents, loamy	1.0	0.9%
W	Water	5.3	4.8%
Totals for Area of Interest		**110.4**	**100.0%**

Figure 6.11
Buck Creek WWTP

Soil Map—Tippecanoe County, Indiana



Map Scale: 1:3,840 if printed on A portrait (8.5" x 11") sheet.

N

Meters: 0 50 100 200 300

Feet: 0 150 300 600 900

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Tippecanoe County, Indiana
Survey Area Data: Version 20, Sep 7, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 7, 2010—Dec 26, 2016

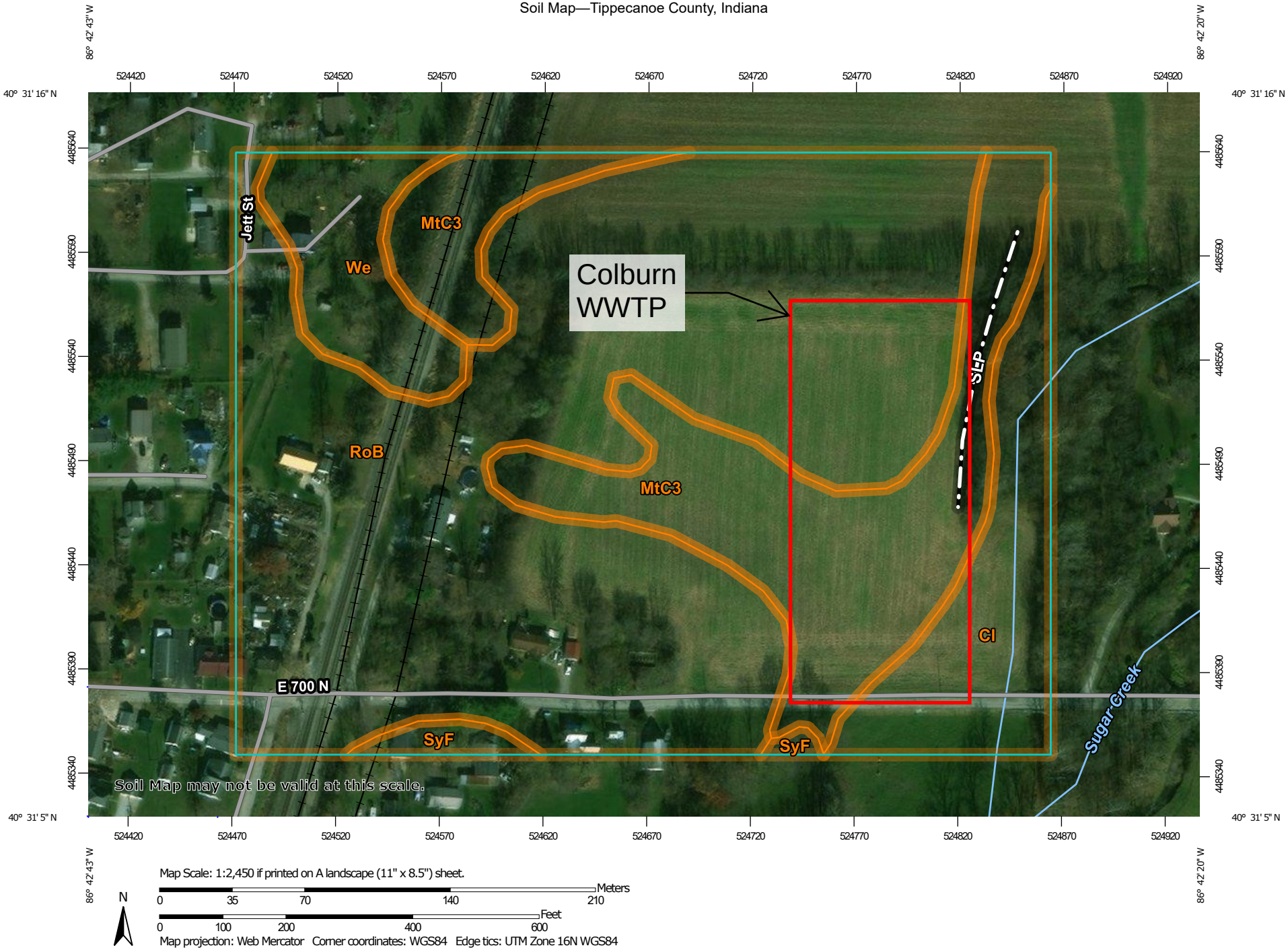
The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CtA	Crosby silt loam, fine-loamy subsoil, 0 to 2 percent slopes	44.4	69.1%
CwB2	Crosby-Miami silt loams, 2 to 4 percent slopes, eroded	11.2	17.4%
Md	Mahalasville-Treaty complex	1.7	2.6%
MsC2	Miami silt loam, 6 to 12 percent slopes, eroded	2.9	4.5%
RoB	Rockfield silt loam, 1 to 3 percent slopes	4.2	6.5%
Totals for Area of Interest		**64.3**	**100.0%**

Figure 6.13
Colburn WWTP

Soil Map—Tippecanoe County, Indiana



Map Scale: 1:2,450 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 35 70 140 210

Feet: 0 100 200 400 600

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Tippecanoe County, Indiana
Survey Area Data: Version 20, Sep 7, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Nov 7, 2010—Dec 26, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
Cl	Ceresco loam, gravelly substratum, occasionally flooded	2.7	9.5%
MtC3	Miami clay loam, 6 to 12 percent slopes, severely eroded	6.1	21.7%
RoB	Rockfield silt loam, 1 to 3 percent slopes	17.4	61.6%
SyF	Strawn-Rodman complex, 18 to 50 percent slopes	0.3	1.2%
We	Washtenaw silt loam	1.7	6.0%
Totals for Area of Interest		**28.2**	**100.0%**

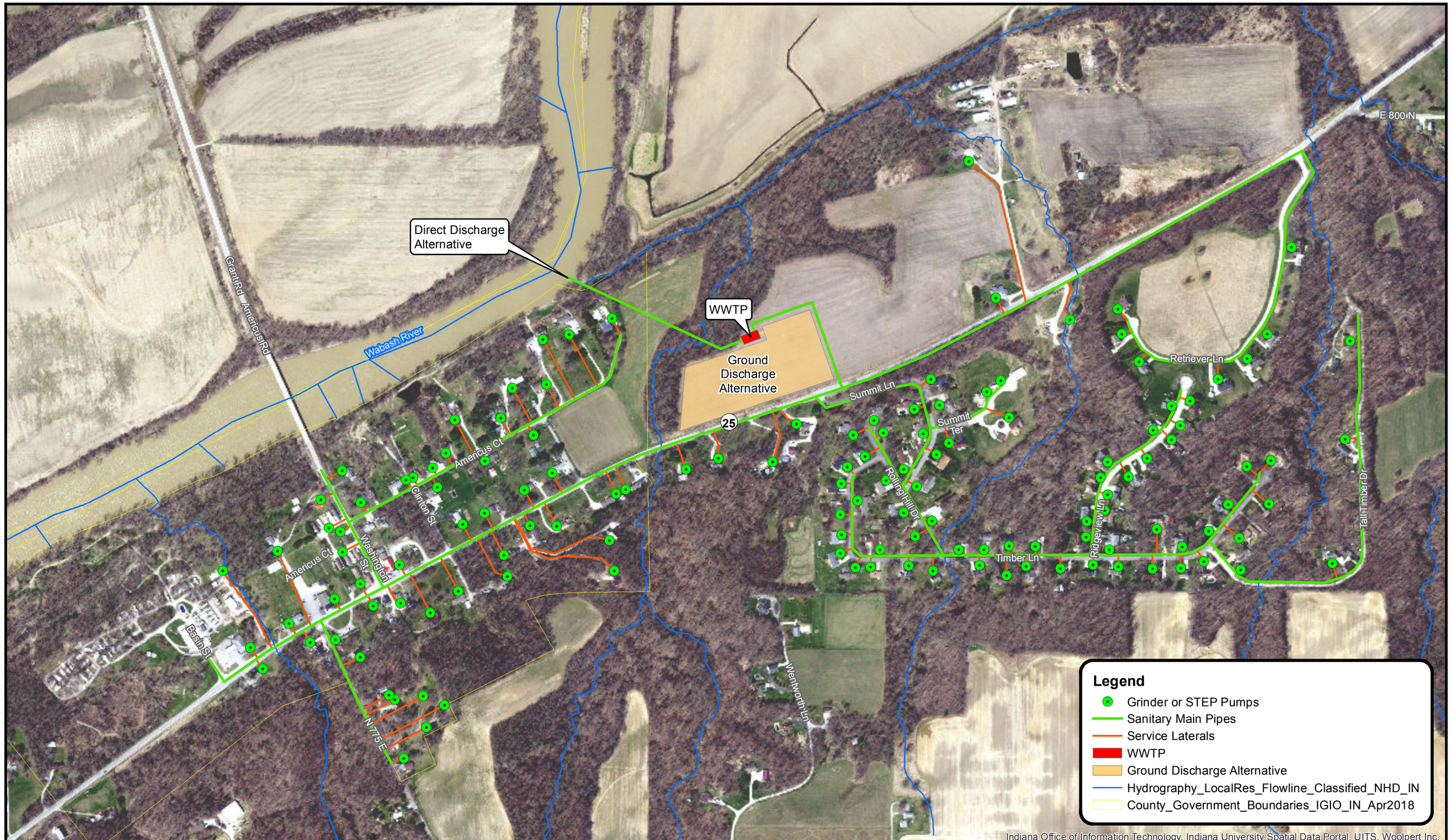


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Figure 6.14
Americus - Localized Wastewater Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880

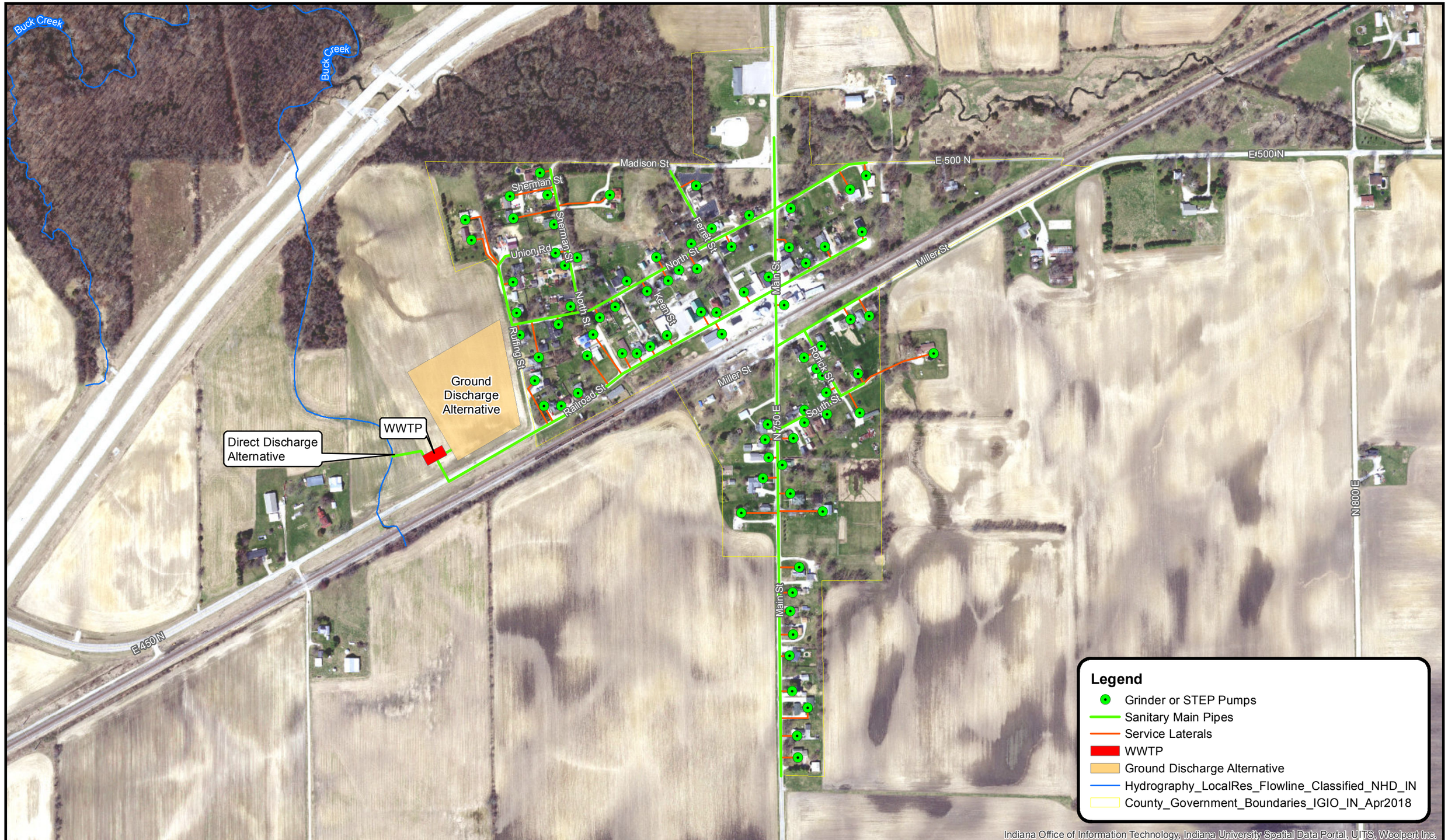

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Figure 6.15
Buck Creek - Localized Wastewater Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880

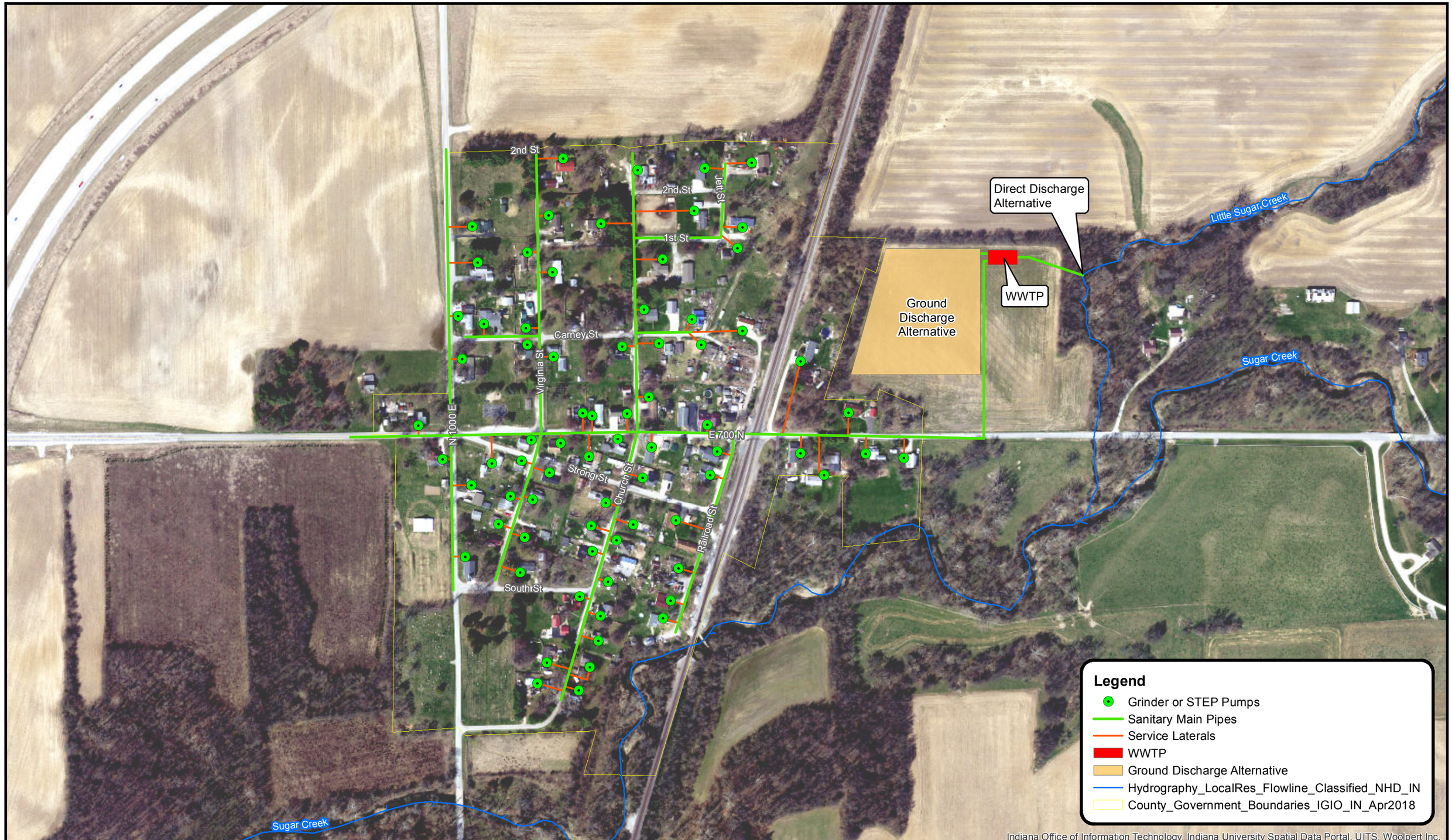

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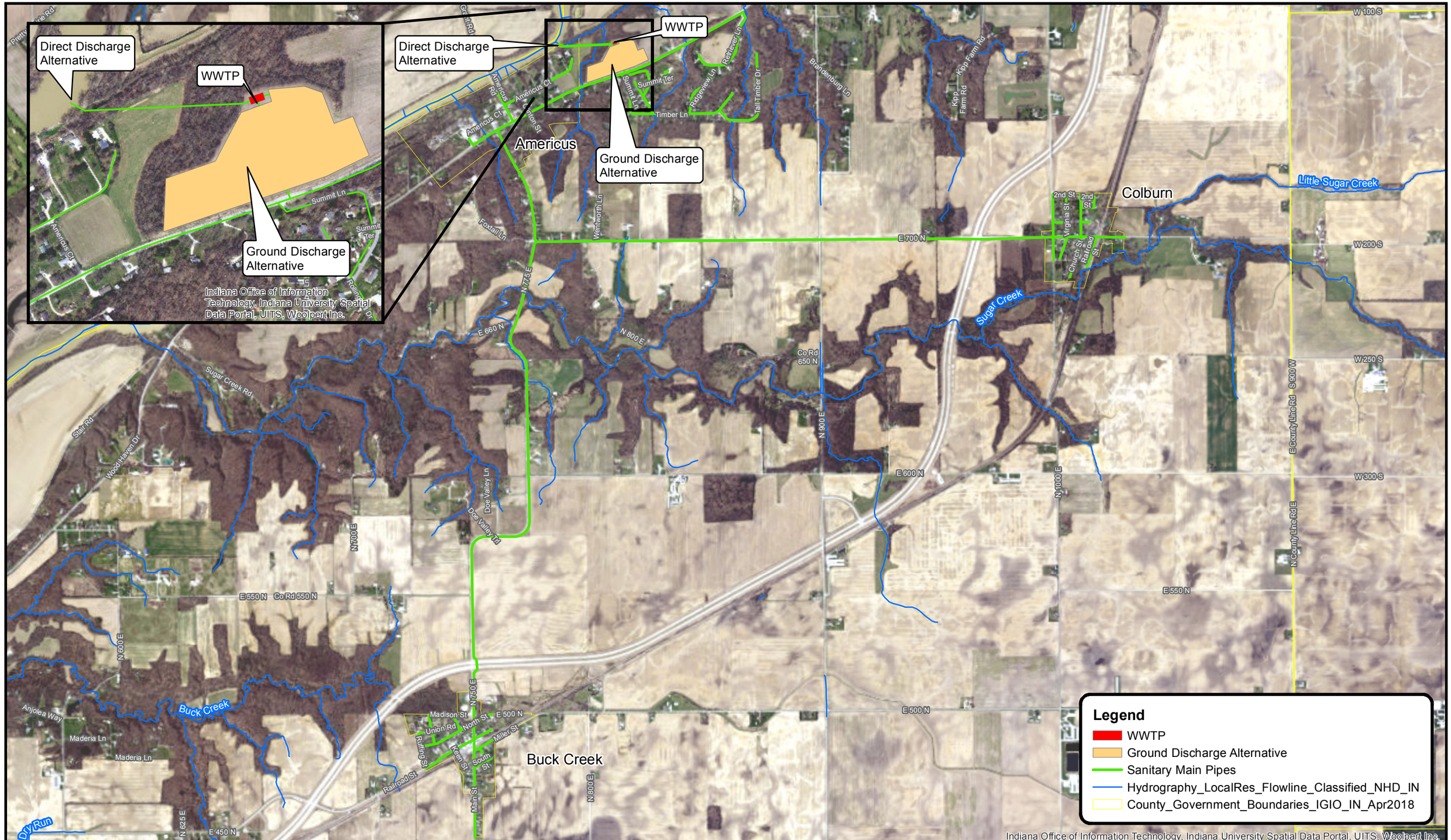
Figure 6.16
Colburn - Localized Wastewater Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880



0 1,000 2,000 4,000 Feet

Figure 6.17
Centralized - Wastewater Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880

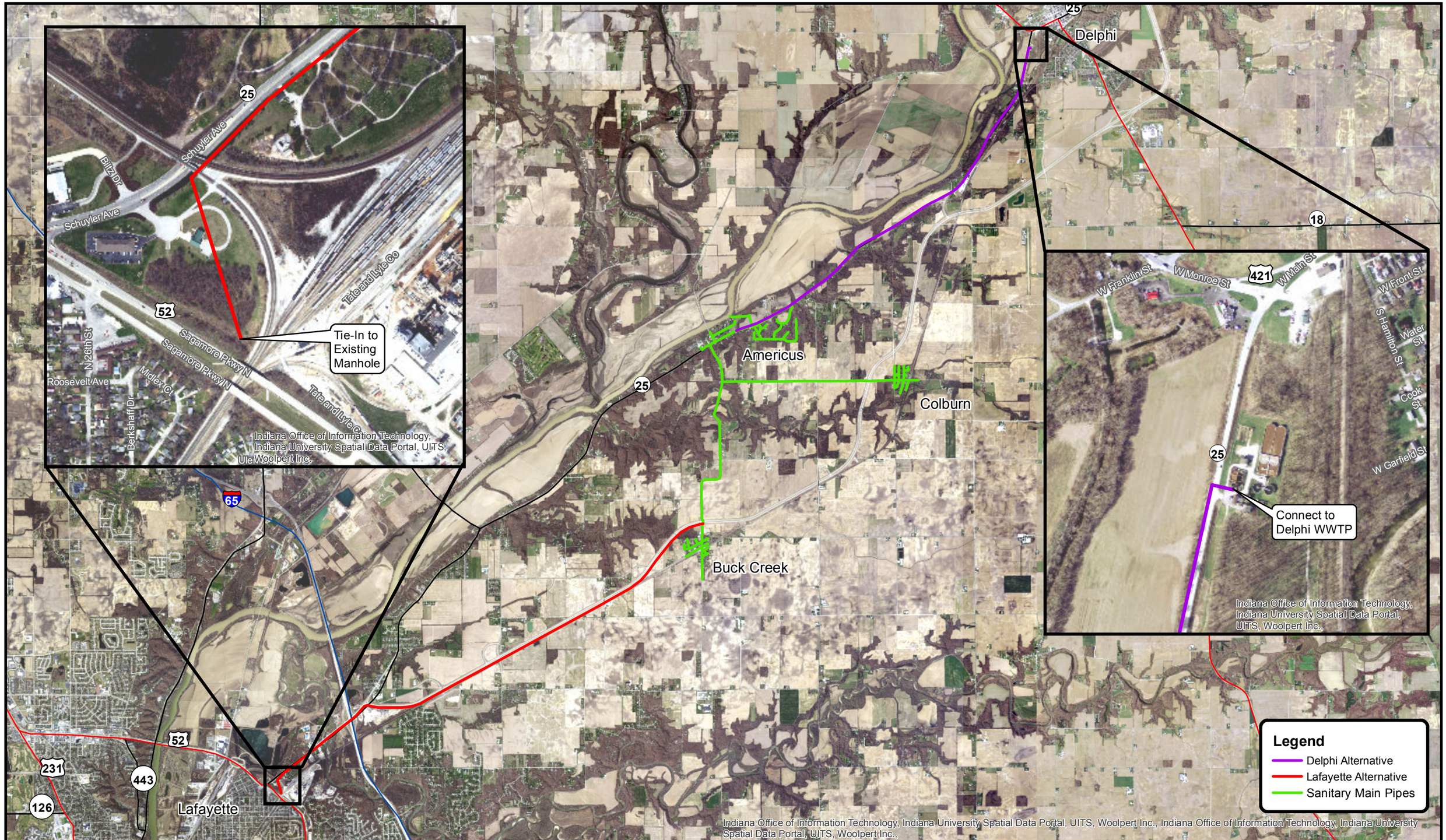


Figure 6.18
Regionalized - Wastewater Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880

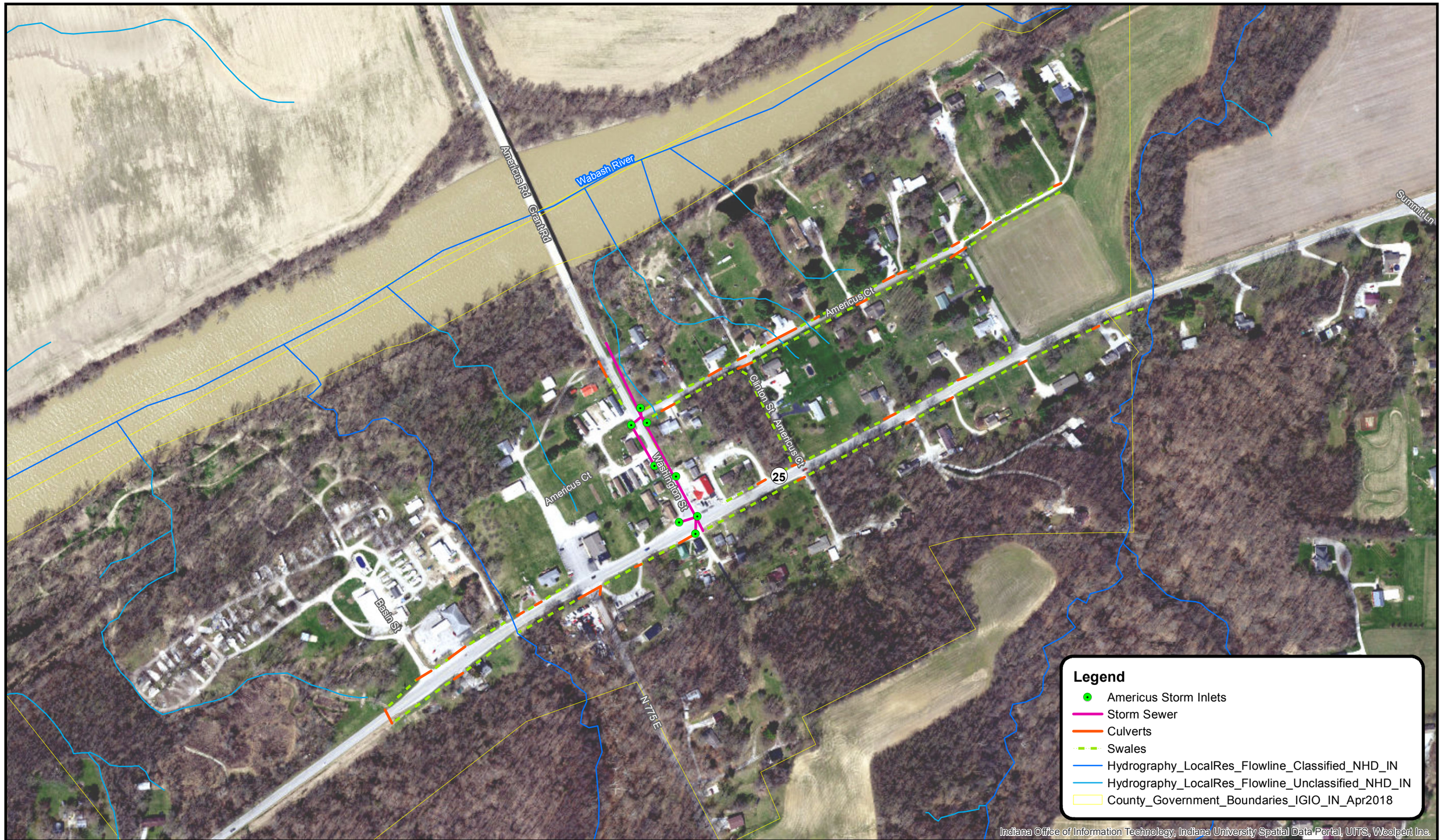


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Figure 6.19
Americus - Stormwater Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880

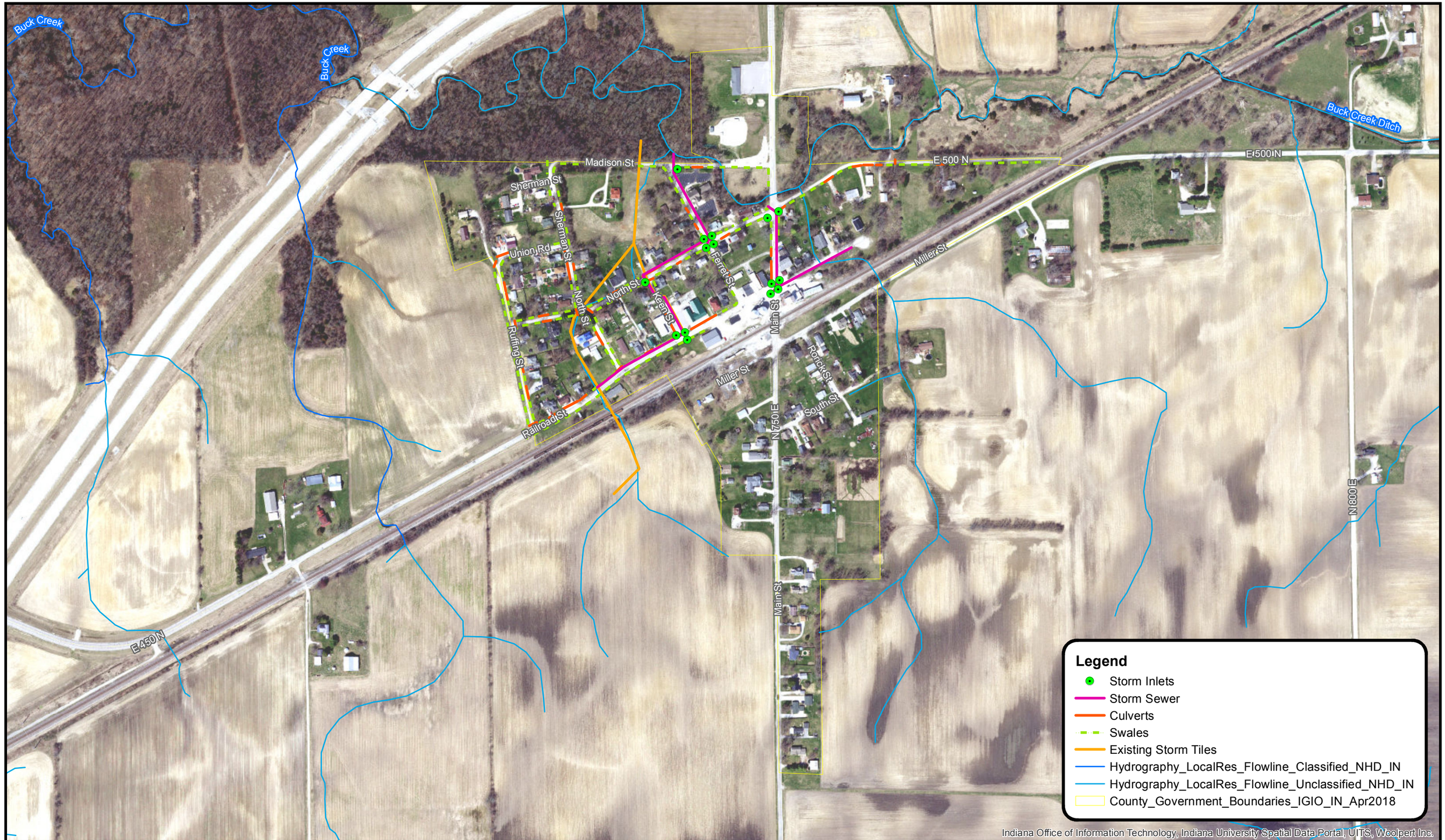

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Figure 6.20
Buck Creek - Stormwater Map
Tippecanoe County, Indiana

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3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
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Figure 6.21
Colburn - Stormwater Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP
3502 Woodview Trace, Suite 150
Indianapolis, IN 46268
Phone: (317) 222-3880

APPENDIX 2: STUDY AREA QUESTIONNAIRE

Tom Murtaugh
David Byers
Tracy Brown

TIPPECANOE COUNTY BOARD OF COMMISSIONERS

County Office Building
20 North 3rd Street
Lafayette, Indiana
47901-1214

phone 765.423.9215
fax 765.423.9196

February 28, 2019

To help assess our current utility needs (Drinking Water, Wastewater, or Stormwater Drainage) and to plan for the future, the Tippecanoe County Commissioners' office is distributing this three (3) question survey to help identify any potential issues with the utilities that you may be experiencing at or near your home or business. If you are currently experiencing any Drinking Water, Wastewater, or Stormwater Drainage issues, please assist Tippecanoe County by responding to the questions below.
Tippecanoe County has contracted with Lochmueller Group, 130 South Main Street, Suite 300, South Bend, IN 46601, 574-334-5460. Lochmueller Group will create a Utility Master Plan and aid Tippecanoe County with planning for future utility improvements. This plan will consider any deficiencies and recommend solutions to remedy them. This plan will identify priority areas and also address future growth potential.

Please drop off or mail your completed questionnaire to Tippecanoe County Commissioners Office, 20 North Third Street, Lafayette, IN 47901 by March 15th, 2019.
Thank you for your time and assistance.

David S. Byers	Tracy A. Brown	Thomas P. Murtaugh
President	Vice President	Commissioner

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APPENDIX 3: MEETING MINUTES

LOCHMUELLER GROUP
130 South Main Street, Suite 300
South Bend, IN 46601
PHONE: 574.334.5460

MEETING MINUTES

Date of Meeting:	February 1, 2019	**Re:**	Utility Master Plan Technical Assistance (Buck Creek, Colburn, and Americus)
Location:	Tippecanoe County Government Building 20 North 3rd Street Lafayette, IN 47901	**Issue Date:**	February 7, 2019
Submitted By:	Mike Gangstad, P.E.		

In Attendance:

Tippecanoe County:	(in alphabetical order by last name)
Zach Beasley	Surveyor
Tracy Brown	Commissioner
Nick Davis	Health
Mark Eastman	USDA
Sallie Fahey	APC
Sharon Hutchison	Commissioner's Office
Stewart Kline	Highway
Barb Knochel	Washington Township
Tom Murtaugh	Commissioner
Ron Noles	Health
Mike Spencer	Highway
Engineer:	
Susan Al Abbas	Lochmueller Group
Mike Gangstad	Lochmueller Group
Erin Wenger	Lochmueller Group

ITEMS DISCUSSED:

I. Introductions were made and the sign-up sheet was circulated.
II. This meeting was the first of the Internal Work Group (IWG) meetings.
III. Lochmueller Group described a Utility Master Plan: A Road Map to assist the communities in the development of their Wastewater, Drinking Water, and Stormwater Utilities.
IV. Lochmueller Group described the general components of the Utility Master Plan:
    a. General Background: an overview of the three communities from multiple perspectives
    b. Existing Facilities: Discussion of the current wastewater, drinking water, and stormwater infrastructure for the three communities
    c. Need for Project: Establishment of the need for utility infrastructure improvements (poor condition or lack of sewage disposal systems)
    d. Alternatives Considered: Development of Alternatives for improvements to the utility infrastructure (Wastewater, Drinking Water, and Stormwater). Considerations will be made for Regional, Centralized, and Local solutions.
    e. Recommended Alternatives: Performance of a Life Cycle Cost Analysis (LCCA) to narrow down the alternatives. Development of an Implementation Schedule for the improvements.
V. There was a discussion of the formation of a Water Infrastructure Planning committee (WIPC) and future meeting times for the IWG and the WIPC:
    a. Second week of March, 2019 – Water Infrastructure Planning Committee (WIPC) Meeting (Educational, Discussion of potential alternatives)
    b. April 9th, 2019 at 10 AM at the Tippecanoe County Government Building – IWG Meeting (Introduction of the Preliminary Alternatives)
    c. May 7th, 2019 at 10 AM at the Tippecanoe County Government Building – IWG Meeting (Final Alternatives / Draft of Plan)
    d. Third week of May, 2019 – WIPC Meeting (Present Draft of Plan)
    e. June 4th, 2019 at 10 AM at the Tippecanoe County Government Building – IWG Meeting (Final Plan Presentation)
    f. June 26th, 2019 – Public Hearing
    g. Third Week of June, 2019 - Commissioner's Meeting (Acceptance of Plan)

VI. Lochmueller Group discussed various sources of information to gather for the purposes of development of the Plan:

a. Existing Documents:

i. Heartland Corridor Strategic Economic Development and Land Use Plan (2016) – Lochmueller Group has this

ii. Lafayette Service Area 21 Plan (2012)

iii. The Comprehensive Plan for Tippecanoe County

iv. Adopted Land Use Plan from 2016

v. Transportation Plan (to 2045), this supersedes the Comprehensive Plan for the study area

vi. Nitrate Study ('91 – '92)

vii. County GIS

viii. Town Plat Maps

ix. Regulated Drain Plans from Surveyor

b. Local knowledge:

i. IWG Meetings,

ii. WIPC Meetings,

iii. Stakeholder Questionnaires: Lochmueller Group will prepare a sample questionnaire to send to Tippecanoe County. Tippecanoe County will send these out to the property owners in the three communities.

iv. On-Site visits to the communities.

v. Notes:

1. A new Fire Station is planned to be built in Buck Creek
2. The SR 225 bridge may be replaced, however not likely
3. Lafayette has indicated a willingness to accept additional flows to the existing WWTP, however, the collection system may not have the capacity to accept flows
4. Delphi may have capacity to accept flows

VII. Lochmueller Group led a discussion of the Development of the Preliminary Alternatives:

a. Wastewater:

i. Localized: New Collection System and Wastewater Treatment Plant (WWTP) for each community.

ii. Centralized: New Collection System for each community, one WWTP for all three.

iii. Regionalized: New Collection System for each community, transport and treat the wastewater by external community.

iv. Notes:
    1. Romney has a STEP collection system and Stockwell has a vacuum collection system.
    2. Grinder Pump systems and STEP systems are potential alternatives for this Plan.
    3. Following are approximate portions of the three communities that have residential, untreated wastewater directly discharging into receiving streams:
        a. Americus: 45%
        b. Buck Creek: 65%
        c. Colburn: 70%

b. Drinking Water:
    i. Localized: New Distribution System, Supply, Storage, and a Water Treatment Plant (WTP) for each community.
    ii. Centralized: New Distribution System and Storage for each community, one supply and one WTP for all three.
    iii. Regionalized: New Distribution System and Storage for each community, finished water supplied by external community.
    iv. Notes:
        1. The proposed alternatives should include provisions for Fire Flows (ability for the system to deliver adequate drinking water for emergency purposes)
        2. Tippecanoe does not have well inspection requirements
        3. The latest information on nitrate pollutants is a study completed in 1992.
        4. There is much potential for water sources in the study area.
    v. Notes:
        1. Lafayette has test wells located by I-65 and Heartland Corridor

c. Stormwater:
    i. Traditional Stormwater Infrastructure: this includes swales, pipes, inlets, etc.)
    ii. Detention / Retention Systems:
        1. Could require a large amount of land.
        2. Zach suggested the existing road Right of Ways may offer potential for stormwater detention.

3. The County does have compensatory storage requirements

iii. Green Infrastructure Systems

d. Land. There was a discussion of the need for land for the proposed improvements associated with this Plan:

i. Wastewater Treatment Plant,

ii. Water Treatment Plant,

iii. Wells,

iv. Storage Tanks

v. Notes:

1. The Park property near Americus may have land for potential use, however, there may be restrictions is the project is funded with federal sources, etc.

The above constitutes our understanding of the meeting. If you believe there are omissions, additions, or corrections, please send your written comments within seven working days to Lochmueller Group.

MEETING MINUTES

LOCHMUELLER GROUP
130 South Main Street, Suite 300
South Bend, IN 46601
PHONE: 574.334.5460

Date of Meeting:	April 9, 2019	**Re:**	Utility Master Plan Technical Assistance (Buck Creek, Colburn, and Americus) – 2nd Internal Work Group Meeting
Location:	Tippecanoe County Government Building 20 North 3rd Street Lafayette, IN 47901	**Issue Date:**	April 18, 2019
Submitted By:	Erin Wenger, PE, CFM		

In Attendance:

Tippecanoe County:	(in alphabetical order by last name)
Zach Beasley	Surveyor
Tracy Brown	Commissioner
Nick Davis	Health
Sallie Fahey	APC
Sharon Hutchison	Commissioner's Office
Barb Knochel	Washington Township
Ron Noles	Health
Mike Spencer	Highway
Engineer:	
Susan Al Abbas	Lochmueller Group
Jeff DeWitt	Lochmueller Group
Mike Gangstad	Lochmueller Group
Erin Wenger	Lochmueller Group

ITEMS DISCUSSED:

I. Lochmueller Group gave a recap of past meetings, summarized the work accomplished to date, and gave an overview of the draft Utility Master Plan document.

II. The general goals of residents for each community was discussed. Americus is more pro-growth, while Buck Creek residents are more focused on fixing existing problems. Colburn has less activity than the other two communities. The master plan document will be plan for the future conditions for the entire study area.

III. Preliminary alternatives for each of the three studied utilities (wastewater, drinking water, and stormwater) were reviewed. Wastewater and drinking water alternatives looked at localized, centralized, and regional options. Stormwater solutions are all localized at the watershed level.
    a. Wastewater
        i. Localized alternatives
            1. New collection system for each community
                a. Grinder pump system
                b. STEP system
                c. The collection system portion of the wastewater alternatives will aim to avoid a separate electrical system for the pumps, but budgeting during the study phase will be completed for the worst case in the event that this is not possible.
                d. The study will include costs for using one pump per house, but during design, it may be possible to serve two homes with one pump to reduce costs.
            2. Wastewater treatment plant (WWTP) for each community
                a. Recirculating media filter (RMF)
                b. Package plant system
            3. Discharge for each WWTP
                a. Direct discharge to a water body
                i. Americus: Wabash River
                ii. Colburn: Little Sugar Creek
                iii. Buck Creek: Unnamed tributary to Buck Creek
                b. On-site
                i. Americus: Drip irrigation system
                ii. Colburn: Mound system
                iii. Buck Creek: Mound system
                iv. Drawbacks of on-site discharge include the large amount of land required and potential limitations in the ability expand if needed in the future.
        ii. Centralized alternatives
            1. New collection system for each community
                a. Grinder pump system
                b. STEP system
            2. Conveyance system from Buck Creek and Colburn to Americus
            3. One WWTP for all three communities located at Americus
                a. RMF
                b. Package plant system
            4. Discharge for the WWTP at Americus
                a. Direct discharge to Wabash River

            b. On-site drip irrigation system
        iii. Regionalized alternatives
            1. New collection system for each community
                a. Grinder pump system
                b. STEP system
            2. Conveyance system from Americus, Buck Creek, and Colburn to:
                a. Lafayette
                b. Delphi
            3. Lochmueller Group should also complete a qualitative review of a scenario involving sending Buck Creek to Americus and Colburn to Dephi. This option does not need to be costed out, but the report should contain a statement explaining that this option was reviewed and why it wasn't pursued further, if necessary.
b. Drinking water
    i. The County decided they would like to look at both a peak daily flow system along with a fire flow system for the drinking water options.
    ii. Localized alternatives
        1. New distribution system for each community
            a. Non-fire flow
            b. Fire flow
        2. Supply system: New well(s) for each community
        3. Storage system: New for each community
            a. Tower water storage tank
            b. Ground water storage tank
        4. Water treatment plant (WTP) for each community
    iii. Centralized alternatives
        1. New distribution system for each community
            a. Non-fire flow
            b. Fire flow
        2. Conveyance piping from WTP (Americus area) to Colburn and Buck Creek
        3. One supply system for all three communities located in Americus area
        4. One storage system for all three communities located in Americus area
        5. One WTP for all three communities located in Americus area
    iv. Regionalized alternatives
        1. New Distribution System for each community
            a. Non-Fire Flow
            b. Fire Flow

2. Finished water supplied by external community
    a. Lafayette
    b. Delphi

v. A countywide nitrate study was completed in 1992. Lochmueller Group will obtain a copy from the County Health Department.

vi. Water quality from wells in the study area was discussed.
    1. Lochmueller Group will research any nitrate testing available from the County Health Department. Ron Noles said well logs are available for review, but he does not think nitrate information is included. If there is no good data currently available, it may be worth considering getting individual testing done. Lochmueller Group with check to see if there is a grant program available for nitrate testing.
    2. Lochmueller Group may reach out to labs in the area to see if there has been any testing done on residences that could be made available. However, it is doubtful that they would be able to release this information without specific permission from the private property owner.
    3. It was mentioned that there are artesian wells in the area that typically do not have very good water quality. In particular, they typically have a sulfur smell.

vii. It was mentioned that Dephi has some drinking water issues that they are dealing with. Lochmueller Group may want to reach out to the mayor or someone other than the wastewater operator to gauge the interest in accepting wastewater or providing water to our project area.

b. Stormwater
    i. A short meeting with Lochmueller Group, the Zach Beasley, and Tracy Brown was held prior to this meeting to discuss solutions for the existing regulated drain in Buck Creek. The Surveyor's Office has developed plans to place a 12" pipe under the railroad. Lochmueller Group's preliminary alternative picks up the new 12" line with a new storm sewer that routes water through Buck Creek along existing road right-of-ways. Lochmueller Group will expand the proposed storm sewer system to serve all of Buck Creek. This will likely involve multiple outfalls because the area includes multiple watersheds.
    ii. A map showing the locations of survey responses was reviewed.
        1. Stormwater problems arising from problems on private property will not be addressed in the study.
        2. Multiple complaints have been received about the drainage along CR 625 E. The Heath Department has been spraying for mosquitos in this area in the summer due to stagnant water.

3. Several complaints in Americus are related to maintenance issues, including clogged driveway culverts.

II. Blanket easements were discussed, and it was decided that they are acceptable during construction only. All blanket easements must collapse after construction to a defined location.

III. The Service Area 21 report should be available from the City of Lafayette, Engineer's Office (Jeromy Grenard), or it may also be available from the engineer that completed the study (either BF&S or HWC).

IV. The area along the Heartland Corridor is a TIF area. There may potentially be money available from here.

V. A statement was made that there are a lot of platted alleys available in these communities. However, some of them have been abandoned and given back to the adjacent property owners.

VI. Lochmueller Group will make sure that the wells and WWTPs have the required setbacks from residential properties.

VII. Upcoming meetings
   a. May 7th, 2019 at 10 AM to 2 PM – IWG meeting to discuss the final alternatives and review the draft of the plan / sewer and water district formation.
   b. May 16th, 2019 at 6:30 – WIPC meeting at the Buck Creek Community Center to present the draft plan
   c. June 4th, 2019 at 10 AM – IWG meeting for a final presentation of the plan
   d. July 11th, 2019 at 6:30 PM – Public hearing in the Tippecanoe Room at the Tippecanoe County Government Center
   e. July 15th, 2019 – Commissioner's meeting for acceptance of the plan

VIII. A meeting will be scheduled to discuss the potential formation of a sewer and/or water district just for the project area and a countywide district. There are currently several districts and utilities in the county. There should be a way to gain efficiencies by combining at least the administration and operation of these. Existing districts and utilities in the county include:
   a. American Suburban Utilities
   b. Stockwell
   c. Romney
   d. Clarks Hill
   e. Dayton
   f. Battle Ground
   g. Otterbein (which is partially in an adjacent county)

The above constitutes our understanding of the meeting. If you believe there are omissions, additions, or corrections, please send your written comments within seven working days to Lochmueller Group.

MEETING MINUTES

LOCHMUELLER GROUP
130 South Main Street, Suite 300
South Bend, IN 46601
PHONE: 574.334.5460

Date of Meeting:	May 7, 2019	**Re:**	Utility Master Plan Technical Assistance (Buck Creek, Colburn, and Americus) – 3rd Internal Work Group Meeting
Location:	Tippecanoe County Government Building 20 North 3rd Street Lafayette, IN 47901	**Issue Date:**	May 10, 2019
Submitted By:	Mike Gangstad, PE		

In Attendance:

Tippecanoe County:	(in alphabetical order by last name)
Zach Beasley	Surveyor
Tracy Brown	Commissioner
Nick Davis	Health
Barb Knochel	Washington Township
Tom Murtaugh	Commissioner
Ron Noles	Health
Mike Spencer	Highway
Engineer:	
Susan Al Abbas	Lochmueller Group
Jeff DeWitt	Lochmueller Group
Mike Gangstad	Lochmueller Group
Erin Wenger	Lochmueller Group

ITEMS DISCUSSED:

I. Lochmueller Group gave a recap of past meetings, summarized the work accomplished to date, and gave an overview of the draft Utility Master Plan document.

II. Selected alternatives for each of the three studied utilities (wastewater, drinking water, and stormwater) were presented. Wastewater and drinking water alternatives looked at localized, centralized, and regional options. Stormwater solutions are all localized at the watershed level.

   a. Wastewater: **CENTRALIZED**. Total Project Cost of $8.2 million.

        i. Grinder Pump systems for ABC (Note: Add $0.7 million for public electrical system),
        ii. Conveyance Piping from Buck Creek and Colburn to Americus,
        iii. Package Plant WWTP located in Americus,
        iv. Direct Discharge to Wabash River.
    b. Drinking Water (Peak Flow Only): **CENTRALIZED.** Total Project Cost of $11.0 million.
        i. New Distribution System for ABC,
        ii. Wells and Water Treatment Plant located at Americus,
        iii. Ground Storage Tank and Booster Pump Station located at Americus.
    c. Drinking Water (Fire Flow): **REGIONALIZED.** Total Project Cost of $13.5 million.
        i. New Distribution System for ABC,
        i. Conveyance piping from Lafayette.
    b. Stormwater:
        i. Buck Creek:
            1. Storm Sewer Project: $660,000
            2. Ditch / Culvert Replacement Project: $600,000
        ii. Americus:
            1. Storm Sewer Project: $220,000
            2. Ditch / Culvert Replacement Project: $430,000
        iii. Colburn:
            1. Ditch / Culvert Replacement Project: $380,000

III. General Comments:
    a. The study area should be expanded to include the neighborhood to the east of Americus. This could potentially add approximately 77 more customers.
    b. There was an historic canal in the Americus area. This should be checked to see if there is any impact to the proposed projects.
    c. The existing roadways (county roads, e.g.) may not have right-of-way available to install proposed improvements. Mike S. said he will check into the status of the roadways with this regard. There may be a potential to install the proposed piping directly under the roadway using trenchless technologies to reduce disturbances.
    d. Ron will send email correspondence from IDEM regarding septic tank issues in Buck Creek.
    e. A recent project in Romney, IN was completed that used SRF and RD funding and was similar to the projects in this plan.
    f. It may be advantageous to “combine” the Wastewater and the Stormwater projects identified in this plan. The implementation schedule will reflect this idea.
    g. The Drinking Water implementation schedule for this plan will not be included. Language will be included to reflect that future considerations will dictate the development of the schedule.

h. The draft UMP will be updated to reflect the comments from this meeting. The final draft will then be distributed to the group.

IV. Upcoming meetings:

c. May 16th, 2019 at 6:30 – WIPC meeting at the Buck Creek Community Center to present the draft plan
d. June 4th, 2019 at 10 AM – IWG meeting for a final presentation of the plan
e. July 11th, 2019 at 6:30 PM – Public hearing in the Tippecanoe Room at the Tippecanoe County Government Center
f. July 15th, 2019 – Commissioner's meeting for acceptance of the plan

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The above constitutes our understanding of the meeting. If you believe there are omissions, additions, or corrections, please send your written comments within seven working days to Lochmueller Group.

MEETING MINUTES

LOCHMUELLER GROUP
130 South Main Street, Suite 300
South Bend, IN 46601
PHONE: 574.334.5460

Date of Meeting:	June 6, 2019	**Re:**	Utility Master Plan Technical Assistance (Buck Creek, Colburn, and Americus) – 4th Internal Work Group Meeting
Location:	Tippecanoe County Government Building 20 North 3rd Street Lafayette, IN 47901	**Issue Date:**	June 11, 2019
Submitted By:	Mike Gangstad, PE		

In Attendance:

Tippecanoe County:	(in alphabetical order by last name)
Zach Beasley	Surveyor
Tracy Brown	Commissioner
Nick Davis	Health
Sallie Fahey	APC
Sharon Hutchison	Commissioners Office
Barb Knochel	Washington Township
Tom Murtaugh	Commissioner
Ron Noles	Health
Tim Stroshine	APC
Engineer:	
Mike Gangstad	Lochmueller Group

ITEMS DISCUSSED:

I. Lochmueller Group gave an overview of the Utility Master Plan document:
   a. Executive Summary,
   b. Master Plan Overview,
   c. Project Planning Area,
   d. Existing Facilities / Specific Problems,
   e. Need for Project,
   f. Alternatives Considered,
   g. Recommended Alternatives,
   h. Integrated Planning and Implementation,

i. Funding Considerations,
j. Summary and Conclusions.

II. Next Steps include beginning the discussions of formation of a Utility District. A future meeting should be arranged.

III. General Comments:
   a. The table of members of the WIPC group needs to be added to / revised.
   b. The Tippecanoe County GIS system indicates floodplains may be in the study area. This would deviate from the FIRM information.
   c. The Colburn population listed in the plan should be checked. It seems low.
   d. The cost tables (6-1 and 6-2) should include Life Cycle Cost information. Include a key for acronyms. Bold the selected alternatives.
   e. Include a table for the Stormwater alternatives similar to the DW and WW.
   f. Table 7-1: indicate the time for each task (as opposed to dates).
   g. Figure 6.18: information "balloon" should be pointing at correct location.
   h. Land Acquisition costs should be included in the alternatives.
   i. In Appendix 4, the "no FF" should be renamed "Peak Flow" to match the text in the plan.
   j. All figures should be rotated 180 degrees.
   k. The UMP will be updated to reflect the comments from this meeting. The final UMP will then be distributed to the group.

IV. Upcoming meetings:
   a. TBD – Utility District formation Discussion Meeting
   b. TBD – Public hearing in the Tippecanoe Room at the Tippecanoe County Government Center
   c. TBD – Commissioner's meeting for acceptance of the plan

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The above constitutes our understanding of the meeting. If you believe there are omissions, additions, or corrections, please send your written comments within seven working days to Lochmueller Group.

6/6/2019 Buck Creek Master Utility Planning

NAME	Dept	Signature	email
Zach Beasley	Surveyor	Zach Beasley	zbeasley@tippecanoe.in.gov
Tracy Brown	Commissioners	Tracy Brown	tabrown@tippecanoe.in.gov
David Byers	Commissioners		dbyers@tipppecanoe.in.gov
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Mark Eastman	USDA		Mark.Eastman@in.usda.gov
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Stewart Kline	Highway		skline@tippecanoe.in.gov
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Susan Al Abbas	Lochmueller		Salabbas@lochgroup.com
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Michael Gangstad	Lochmueller	Michael P. Gangstad	Mgangstad@lochgroup.com
Erin Wenger	Lochmueller		Ewenger@lochgroup.com
Tim Stroshine	APC	Tim Stroshine	tstroshine@tippecanoe.in.gov

LOCHMUELLER GROUP
130 South Main Street, Suite 300
South Bend, IN 46601
PHONE: 574.334.5460

MEETING MINUTES

Date of Meeting:	March 14, 2019	**Re:**	Utility Master Plan Technical Assistance (Buck Creek, Colburn, and Americus)
Location:	Buck Creek Community Center 5402 Main Street Lafayette, IN 47905	**Issue Date:**	March 22, 2019
Submitted By:	Mike Gangstad, P.E.		
In Attendance:	See attached Sign-in Sheet		

ITEMS DISCUSSED:

I. Commissioner Brown began the meeting by discussing the purpose of the meeting.
II. Introductions were made from everyone in attendance.
III. This meeting was the first of the Water Infrastructure Planning Committee (WIPC) meetings.
IV. Jeff Dewitt began the Presentation:
    a. What is a Utility Master Plan?: A Road Map to assist the communities in the development of their Wastewater, Drinking Water, and Stormwater Utilities.
    b. Description of a Regional Water and Sewer District.
V. Mike Gangstad then continued the presentation:
    a. Description of the Project Area,
    b. Overview of the Questionnaire mailer. Approximately 200 mailers were sent out. Approximately 30 have been returned.
    c. Wastewater Systems Overview:
        i. Description of the methods of utility combinations:
            1. Localized,

2. Centralized,
3. Regionalized.

ii. Collection System,
iii. Treatment System,
iv. Disposal.

d. Drinking Water Systems Overview:
   i. Description of the methods of utility combinations:
      1. Localized,
      2. Centralized,
      3. Regionalized.
   ii. Distribution System,
   iii. Supply,
   iv. Storage and Treatment.

e. Stormwater
   i. Traditional Storm Systems,
   ii. Detention / Retention,
   iii. Green Infrastructure.

f. Alternatives Analysis: To compare the proposed alternatives for this plan, a Life Cycle Cost Analysis (LCCA) will be performed to arrive at the recommended plan components.

VI. Discussion:

a. It was discussed that there may be different systems (gravity sewer versus pumped systems, for example) for each community. Mike said that there is not a "one size fits all" solution for each area. The analyses conducted will optimize the system solutions.

b. There were discussions of multiple issues related to stormwater. All this information will be considered in the development of the solution alternatives.

c. Commissioner Brown stated that the intention of this plan and the various alternatives is to provide positive, real solution and not a "band-aid".

d. Similar projects did not have connection fees associated with the communities.

e. The area generally has a high groundwater elevation (relatively shallow)

VII. Next WIPC Meeting: Tentatively, the third week of May.

WIPC - Buck Creek 3/14/2019

NAME	Signature	email
BJ Bundy		bjbundy@mounet.com
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Michael Gangstad		Mgangstad@lochgroup.com
Erin Wenger		Ewenger@lochgroup.com

3/14/2019

PRINT NAME	SIGNATURE	EMAIL
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Traci NICCUM	[illegible]	Pid146@yahoo.com
Steven Richardson	Steven [illegible]	

MEETING MINUTES

LOCHMUELLER GROUP
130 South Main Street, Suite 300
South Bend, IN 46601
PHONE: 574.334.5460

Date of Meeting:	May 16, 2019	**Re:**	Utility Master Plan Technical Assistance (Buck Creek, Colburn, and Americus)
Location:	Buck Creek Community Center 5402 Main Street Lafayette, IN 47905	**Issue Date:**	May 28, 2019
Submitted By:	Mike Gangstad, P.E.		
In Attendance:	See attached Sign-in Sheet		

ITEMS DISCUSSED:

I. Introductions were made from everyone in attendance.
II. This meeting was the second and final of the Water Infrastructure Planning Committee (WIPC) meetings.
III. Mike Gangstad began the Presentation:
    a. Recap of first meeting.
    b. What is a Utility Master Plan?
    c. Regional Sewer District Description.
    d. Description of the Project Area.
    e. Description of the Alternatives Analysis procedure that was performed.
    f. Wastewater Systems Recommended Alternative: Centralized
        i. Collection System: Grinder Pump Systems,
        ii. Treatment System: Package Plant located in Americus,
        iii. Disposal: Direct Discharge to Wabash River
        iv. Preliminary Opinion of Probable Project Cost: $9.9 M.
    g. Drinking Water Systems Recommended Alternative: Centralized
        i. Distribution System,

ii. Supply,
iii. Storage and Treatment: Located in Americus,
iv. Preliminary Opinion of Probable Project Cost: $12.4 M (Peak Flow) and $15.2 M (Fire Flow).

IV. Erin Wenger discussed the Stormwater Projects:
a. Stormwater (Preliminary Opinion of Probable Project Costs)
i. Buck Creek:
1. Storm Sewer Project: $660k.
2. Ditch / Culvert Replacement Project: $600k.
ii. Americus:
1. Storm Sewer Project: $220k.
2. Ditch / Culvert Replacement Project: $430k.
iii. Colburn:
1. Ditch / Culvert Replacement Project: $380k.

The above constitutes our understanding of the meeting. If you believe there are omissions, additions, or corrections, please send your written comments within seven working days to Lochmueller Group.

NAME	Signature	email
BJ Bundy		bjbundy@mcjunet.com
Tracy Brown	Tracy B. Brown	tabrown@tippecanoe.in.gov
David Byers		dbyers@tippecanoe.in.gov
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Erin Wenger	Erin Wenger	Ewenger@lochgroup.com
Jennifer Weston	Jennifer Weston	jaweston@aol.com

TIPPECANOE COUNTY UTILITY MASTER PLAN
Water Infrastructure Planning Committee (WIPC)
Meeting No. 2

May 16th, 2019

Presented by: Susan Al Abbas, PE, Erin Wenger, PE, and Mike Gangstad, PE

LOCHMUELLER GROUP

PRESENTATION OUTLINE

- Utility Master Plan (UMP) Description
- Regional Water & Sewer District
- Project Area
- Water-Related Utilities that are a part of the Plan
  - Wastewater
  - Drinking Water
  - Stormwater
- Alternatives Analysis (Life Cycle Cost)
  - Wastewater (Localized, Centralized, and Regionalized)
  - Drinking Water (Localized, Centralized, and Regionalized)
  - Stormwater (Localized)
- Discussion

LOCHMUELLER GROUP

UTILITY MASTER PLAN

- What is a Utility Master Plan?
- A Road Map to assist the communities in the development of their Wastewater, Drinking Water, and Stormwater Utilities
- Communities in Project Area:
  - Americus
  - Buck Creek
  - Colburn

LOCHMUELLER GROUP

REGIONAL WATER & SEWER DISTRICT

- What is it? A Regional Water & Sewer District is a form of local government that provides drinking water and wastewater services within an established area
- Board Formation and Governance
  - Appointed and/or elected officials
  - Ensure the utility is compliant with all applicable laws and ordinances

LOCHMUELLER GROUP

PROJECT AREA

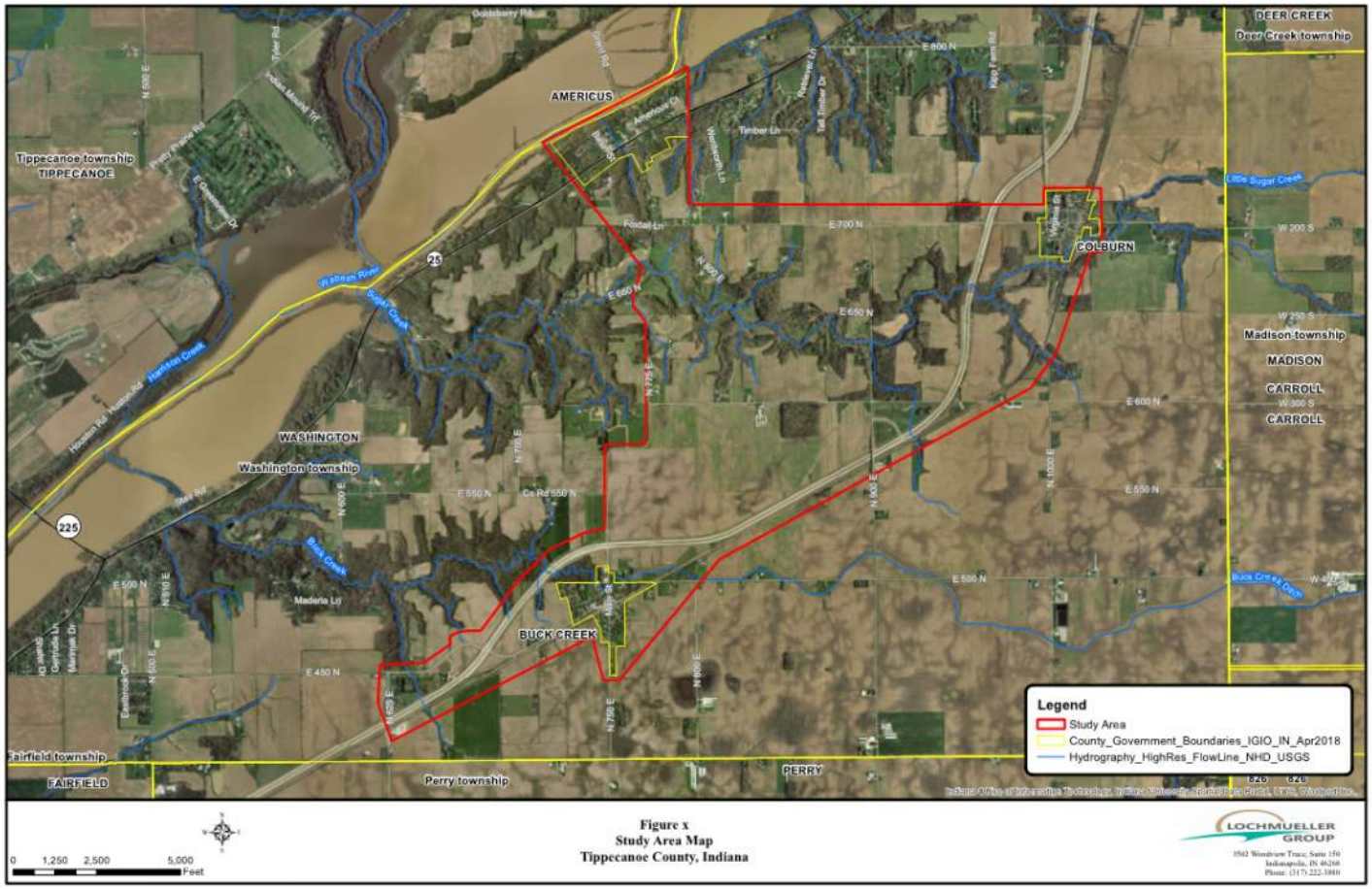

Figure x
Study Area Map
Tippecanoe County, Indiana

LOCHMUELLER GROUP

ALTERNATIVES ANALYSIS

- Life Cycle Cost Analysis (LCCA): Way to compare alternatives based on Capital Cost and Operation & Maintenance Costs over the life of the project components
- Analysis:
  - Wastewater (Localized, Centralized, and Regionalized)
  - Drinking Water (Localized, Centralized, and Regionalized)
  - Stormwater (Localized)

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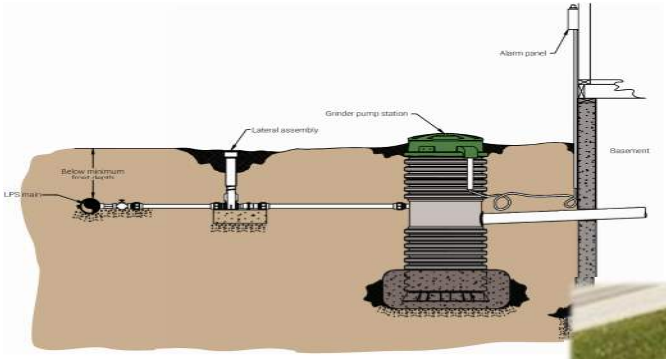
WASTEWATER

- Localized (separate collection, treatment, and disposal systems)
- Centralized (separate collection systems, shared treatment and disposal systems located at Americus) RECOMMENDED ALTERNATIVE
- Regionalized (separate collection systems, shared disposal system to nearby WWTP)

LOCHMUELLER GROUP

WASTEWATER (Recommended Alternative)

- Collection System: Grinder Pump Systems
- Wastewater Treatment System: Package Plant
- Disposal: Direct Discharge to Wabash River
- Preliminary Opinion of Probable Project Cost: $9.9 M



LOCHMUELLER GROUP

DRINKING WATER

- Localized (separate distribution, supply, storage, and treatment systems)
- Centralized (separate distribution and storage systems, shared supply and treatment systems located in Americus) RECOMMENDED ALTERNATIVE (Peak Flow)
- Regionalized (separate distribution and storage systems, finished water by external community

LOCHMUELLER GROUP

DRINKING WATER

- Distribution System (Water Mains, valves, services, hydrants)
- Supply (Wells, Pumps, Pump house)
- Storage and Treatment (tank, filtration, chlorination, etc.)
- Preliminary Opinion of Probable Project Cost: $12.4 M (Peak Flow), $15.2 M (Fire Flow)

LOCHMUELLER GROUP

STORMWATER

- Buck Creek:
  - Storm Sewer Project: $660k
  - Ditch / Culvert Replacement Project: $600k
- Americus:
  - Storm Sewer Project: $220k
  - Ditch / Culvert Replacement Project: $430k
- Colburn:
  - Ditch / Culvert Replacement Project: $380k

LOCHMUELLER GROUP

DISCUSSION

- Questions
- Comments

LOCHMUELLER GROUP

MEETING MINUTES

LOCHMUELLER GROUP
130 South Main Street, Suite 300
South Bend, IN 46601
PHONE: 574.334.5460

Date of Meeting:	June 6, 2019	**Re:**	Utility Master Plan Technical Assistance (Buck Creek, Colburn, and Americus) – 4th Internal Work Group Meeting
Location:	Tippecanoe County Government Building 20 North 3rd Street Lafayette, IN 47901	**Issue Date:**	June 11, 2019
Submitted By:	Mike Gangstad, PE		

In Attendance:

Tippecanoe County:	(in alphabetical order by last name)
Zach Beasley	Surveyor
Tracy Brown	Commissioner
Nick Davis	Health
Sallie Fahey	APC
Sharon Hutchison	Commissioners Office
Barb Knochel	Washington Township
Tom Murtaugh	Commissioner
Ron Noles	Health
Tim Stroshine	APC
Engineer:	
Mike Gangstad	Lochmueller Group

ITEMS DISCUSSED:

I. Lochmueller Group gave an overview of the Utility Master Plan document:
   a. Executive Summary,
   b. Master Plan Overview,
   c. Project Planning Area,
   d. Existing Facilities / Specific Problems,
   e. Need for Project,
   f. Alternatives Considered,
   g. Recommended Alternatives,
   h. Integrated Planning and Implementation,

i. Funding Considerations,
j. Summary and Conclusions.

II. Next Steps include beginning the discussions of formation of a Utility District. A future meeting should be arranged.

III. General Comments:
   a. The table of members of the WIPC group needs to be added to / revised.
   b. The Tippecanoe County GIS system indicates floodplains may be in the study area. This would deviate from the FIRM information.
   c. The Colburn population listed in the plan should be checked. It seems low.
   d. The cost tables (6-1 and 6-2) should include Life Cycle Cost information. Include a key for acronyms. Bold the selected alternatives.
   e. Include a table for the Stormwater alternatives similar to the DW and WW.
   f. Table 7-1: indicate the time for each task (as opposed to dates).
   g. Figure 6.18: information "balloon" should be pointing at correct location.
   h. Land Acquisition costs should be included in the alternatives.
   i. In Appendix 4, the "no FF" should be renamed "Peak Flow" to match the text in the plan.
   j. All figures should be rotated 180 degrees.
   k. The UMP will be updated to reflect the comments from this meeting. The final UMP will then be distributed to the group.

IV. Upcoming meetings:
   a. TBD – Utility District formation Discussion Meeting
   b. TBD – Public hearing in the Tippecanoe Room at the Tippecanoe County Government Center
   c. TBD – Commissioner's meeting for acceptance of the plan

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The above constitutes our understanding of the meeting. If you believe there are omissions, additions, or corrections, please send your written comments within seven working days to Lochmueller Group.

6/6/2019 Buck Creek Master Utility Planning

NAME	Dept	Signature	email
Zach Beasley	Surveyor	Zach Beasley	zbeasley@tippecanoe.in.gov
Tracy Brown	Commissioners	Tracy Brown	tabrown@tippecanoe.in.gov
David Byers	Commissioners		dbyers@tipppecanoe.in.gov
Nick Davis	HEALTH	Nick Davis	ndavis@tippecanoe.in.gov
Mark Eastman	USDA		Mark.Eastman@in.usda.gov
Sallie Fahey	APC	Sallie Fahey	sfahey@tippecanoe.in.gov
Sharon Hutchison	Commissioners	Sharon Hutchison	shutchison@tippecanoe.in.gov
Stewart Kline	Highway		skline@tippecanoe.in.gov
Barb Knochel	Wshngt Twnshp		washingtontownshiptrustee@gmail.com
Tom Murtaugh	Commissioners	T P Murtaugh	tmurtaugh@tippecanoe.in.gov
Ron Noles	HEALTH	Ron Noles	rnoles@tippecanoe.in.gov
Mike Spencer	Highway		mspencer@tippecanoe.in.gov
Mike Kleinpeter	OCRA/CDBG		Mike.Kleinpeter@kleinpeterconsulting.com
Susan Al Abbas	Lochmueller		Salabbas@lochgroup.com
Jeff DeWitt	Lochmueller		Jdewitt@lochgroup.com
Michael Gangstad	Lochmueller	Michael P. Gangstad	Mgangstad@lochgroup.com
Erin Wenger	Lochmueller		Ewenger@lochgroup.com
Tim Stroshine	APC	Tim Stroshine	tstroshine@tippecanoe.in.gov

APPENDIX 4: COSTS

Project: Tippecanoe 218-0348
Date: 5/2/2019

Note:

Alternative	Const. Cost	20% Contingency	Non-Const. Cost	Total Project Cost	Annual O&M	Annual SLA's	Salvage Value
Buck Creek - Fire Flow	$ 3,789,100	$ 757,900	$ 1,004,900	$ 5,551,900	$ 69,900	$ 26,227	$ 1,145,158
Buck Creek -Peak Flow	$ 2,231,200	$ 446,300	$ 602,800	$ 3,280,300	$ 69,900	$ 35,027	$ 557,048
Americus - Fire Flow	$ 5,066,000	$ 1,013,200	$ 1,334,200	$ 7,413,400	$ 71,400	$ 43,393	$ 1,588,583
Americus - Peak Flow	$ 2,987,000	$ 597,400	$ 797,900	$ 4,382,300	$ 71,400	$ 26,593	$ 746,393
Colburn - Fire Flow	$ 3,477,000	$ 695,400	$ 924,300	$ 5,096,700	$ 69,900	$ 37,227	$ 1,051,858
Colburn - Peak Flow	$ 2,246,100	$ 449,300	$ 606,800	$ 3,302,200	$ 69,900	$ 24,027	$ 565,148
Centralized - Fire Flow	$ 13,311,400	$ 2,662,300	$ 3,470,700	$ 19,444,400	$ 76,400	$ 63,240	$ 4,567,542
Centralized - Peak Flow	$ 8,571,700	$ 1,714,400	$ 2,247,700	$ 12,533,800	$ 76,400	$ 34,727	$ 2,628,753
Regional - Lafayette	$ 14,021,100	$ 2,804,300	$ 3,617,700	$ 20,443,100	$ 169,400	$ 12,500	$ 5,654,375
Regional - Delphi	$ 13,451,700	$ 2,690,400	$ 3,470,900	$ 19,613,000	$ 252,600	$ 12,500	$ 5,413,225

LIFE CYCLE COST ANALYSIS (Drinking Water Alternatives)

Parameter	Localized - Buck Creek Fire Flow	Localized - Buck Creek Peak Flow	Localized - Americus Fire Flow	Localized - Americus Peak Flow	Localized - Colburn Fire Flow	Localized - Colburn Peak Flow	Centralized - Fire Flow	Centralized - Peak Flow	Regionalized - Lafayette	Regionalized - Delphi
Planning Period (years)	20	20	20	20	20	20	20	20	20	20
Real Discount Rate (%)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total Project Capital Cost	$ 5,551,900	$ 3,280,300	$ 7,413,400	$ 4,382,300	$ 5,096,700	$ 3,302,200	$ 19,444,400	$ 12,533,800	$ 20,443,100	$ 19,613,000
Annual Value Capital Cost	$ 277,595	$ 164,015	$ 370,670	$ 219,115	$ 254,835	$ 165,110	$ 972,220	$ 626,690	$ 1,022,155	$ 980,650
Present Value Capital Cost	**$ 5,551,900**	**$ 3,280,300**	**$ 7,413,400**	**$ 4,382,300**	**$ 5,096,700**	**$ 3,302,200**	**$ 19,444,400**	**$ 12,533,800**	**$ 20,443,100**	**$ 19,613,000**
Cost for O&M per Year	$ 69,900	$ 69,900	$ 71,400	$ 71,400	$ 69,900	$ 69,900	$ 76,400	$ 76,400	$ 169,400	$ 252,600
Present Value O&M Cost	**$ 1,327,221**	**$ 1,327,221**	**$ 1,355,702**	**$ 1,355,702**	**$ 1,327,221**	**$ 1,327,221**	**$ 1,450,639**	**$ 1,450,639**	**$ 3,216,469**	**$ 4,796,222**
Annual Equipment Replacement Cost	$ 26,227	$ 35,027	$ 43,393	$ 26,593	$ 37,227	$ 24,027	$ 63,240	$ 34,727	$ 12,500	$ 12,500
Present Value Eqmt. Repl. Cost	**$ 497,977**	**$ 665,066**	**$ 823,927**	**$ 504,939**	**$ 706,838**	**$ 456,204**	**$ 1,200,764**	**$ 659,370**	**$ 237,343**	**$ 237,343**
Salvage Value	**$ 1,145,158**	**$ 557,048**	**$ 1,588,583**	**$ 746,393**	**$ 1,051,858**	**$ 565,148**	**$ 4,567,542**	**$ 2,628,753**	**$ 5,654,375**	**$ 5,413,225**
Total Life Cycle Cost - Present Value	**$ 6,231,939**	**$ 4,715,539**	**$ 8,004,446**	**$ 5,496,547**	**$ 6,078,901**	**$ 4,520,477**	**$ 17,528,261**	**$ 12,015,056**	**$ 18,242,537**	**$ 19,233,340**

Tippecanoe County
Buck Creek Fire Flow Water Distribution System

Cost Estimate - Water Supply - Buck Creek Fire Flow Alternative				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 10,000	$ 10,000
Mobilization/Demobilization (3%)	LS	1	$ 110,070	$ 110,070
Water Supply Costs				
8-inch Well (75 gpm capacity)	EA	4	$ 150,000	$ 600,000
Water Main, PVC, 2"	LF	350	$ 60	$ 21,000
Well House	EA	4	$ 25,000	$ 100,000
Elevated Storage Tank (210,000 gal)	EA	1	$ 990,000	$ 990,000
Filtration	EA	1	$ 307,200	$ 307,200
Chlorine Storage Tank	EA	1	$ 30,000	$ 30,000
Chlorine Pump System	EA	1	$ 24,000	$ 24,000
Water Treatment Building	EA	1	$ 200,000	$ 200,000
Electrical Connect and Panel	LS	1	$ 162,330	$ 162,400
Backup Generator	EA	1	$ 30,000	$ 30,000
Surface Restoration	LS	1	$ 8,000	$ 8,000
Pollution, Erosion and Sediment Control	LS	1	$ 12,000	$ 12,000
Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
8" Watermain	LF	11,600	$ 65	$ 754,000
Bore Under Railroad	LF	75	$ 500	$ 37,500
Water Service Connections	EA	64	$ 3,500	$ 224,000
Valves	EA	20	$ 1,500	$ 30,000
Hydrant Assembly	EA	15	$ 3,750	$ 56,300
Tees, Crosses, and other Fittings	EA	80	$ 650	$ 52,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	11,600	$ 1	$ 11,600
Construction Subtotal				**$ 3,789,100**
Contingency (20%)				**$ 757,900**
Construction Total				**$ 4,547,000**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 545,700	$ 545,700
Resident Project Representation	LS	1	$ 272,900	$ 272,900
Local Council	LS	1	$ 45,470	$ 45,500
Bond Council	LS	1	$ 68,205	$ 68,300
Land Acquisition	LS	3	$ 9,000	$ 27,000
Financial	LS	1	$ 45,470	$ 45,500
Non-Construction Total				**$ 1,004,900**
Alternative Total Cost				**$ 5,551,900**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Annual Well Inspection	1	LS	$ 375.00	$ 375.00
Well Pump Power	1	LS	$ 8,500.00	$ 8,500.00
Water Treatment Power	1	LS	$ 1,000.00	$ 1,000.00
Labor for Inspection and Maintenance	1	LS	$ 60,000.00	$ 60,000.00
				$ -
			Total Annual O&M:	**$ 69,900**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Well Pump Replacement	4	0	20	$ 55,000.00	$ 220,000.00	$ 11,000.00
Chlorine Pumps	1	0	10	$ 24,000.00	$ 24,000.00	$ 2,400.00
Electrical	1	0	15	$ 192,400.00	$ 192,400.00	$ 12,826.67
Air Release Valves	20	0	20	$ 1,500.00	$ 30,000.00	(>15 years)
Storage Tank	1	0	40	$ 1,020,000.00	$ 1,020,000.00	(>15 years)
Water Treatment Building	1	0	40	$ 200,000.00	$ 200,000.00	(>15 years)
Piping	1	0	40	$ 812,500.00	$ 812,500.00	(>15 years)
					Total Annual SLA:	**$ 26,226.67**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Well Pump Replacement	4	0	10	$ 55,000.00	$ 220,000.00	$ -
Chlorine Pumps	1	0	10	$ 24,000.00	$ 24,000.00	$ -
Electrical	1	0	15	$ 192,400.00	$ 192,400.00	$ 128,908.00
Air Release Valves	20	0	20	$ 1,500.00	$ 30,000.00	$ -
Storage Tank	1	0	40	$ 1,020,000.00	$ 1,020,000.00	$ 510,000.00
Water Treatment Building	1	0	40	200,000	200,000	$ 100,000.00
Piping	1	0	40	$ 812,500.00	$ 812,500.00	$ 406,250.00
					Total Salvage Value:	**$ 1,145,158.00**

Key

EA - Each
LS - Lump Sum
LF - Lineal Feet
SY - Square Yard

Tippecanoe County
Buck Creek Peak Flow Water Distribution System

Cost Estimate - Water Supply - Buck Creek Peak Flow Alternative				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 10,000	$ 10,000
Mobilization/Demobilization (3%)	LS	1	$ 66,936	$ 66,936
Water Supply Costs				
8-inch Well (75 gpm capacity)	EA	2	$ 150,000	$ 300,000
Water Main, PVC, 2"	LF	350	$ 60	$ 21,000
Well House	EA	2	$ 25,000	$ 50,000
Booster Pump Station	EA	1	$ 130,000	$ 130,000
Ground Storage Tank (36,000 gal)	EA	1	$ 110,000	$ 110,000
Filtration	EA	1	$ 307,200	$ 307,200
Chlorine Storage Tank	EA	1	$ 30,000	$ 30,000
Chlorine Pump System	EA	1	$ 24,000	$ 24,000
Water Treatment Building	EA	1	$ 180,000	$ 180,000
Electrical Connect and Panel	LS	1	$ 129,330	$ 129,400
Backup Generator	EA	1	$ 30,000	$ 30,000
Surface Restoration	LS	1	$ 8,000	$ 8,000
Pollution, Erosion and Sediment Control	LS	1	$ 12,000	$ 12,000
Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
4" Watermain	LF	11,600	$ 45	$ 522,000
Bore Under Railroad	LF	75	$ 500	$ 37,500
Water Service Connections	EA	64	$ 3,500	$ 224,000
Valves	EA	20	$ 1,500	$ 30,000
Hydrant Assembly	EA	2	$ 3,750	$ 7,500
Tees, Crosses, and other Fittings	EA	80	$ 600	$ 48,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	11,600	$ 1	$ 11,600
Water Distribution Construction Subtotal				**$ 2,231,200**
Contingency (20%)				**$ 446,300**
Construction Total				**$ 2,677,500**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 321,300	$ 321,300
Resident Project Representation	LS	1	$ 160,700	$ 160,700
Local Council	LS	1	$ 26,775	$ 26,800
Bond Council	LS	1	$ 40,163	$ 40,200
Land Acquisition	LS	3	$ 9,000	$ 27,000
Financial	LS	1	$ 26,775	$ 26,800
Non-Construction Total				**$ 602,800**
Alternative Total Cost				**$ 3,280,300**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Annual Well Inspection	1	LS	$ 375.00	$ 375.00
Well Pump Power	1	LS	$ 8,500.00	$ 8,500.00
Water Treatment Power	1	LS	$ 1,000.00	$ 1,000.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 60,000.00	$ 60,000.00
				$ -
			Total Annual O&M:	**$ 69,900**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Well Pump Replacement	4	0	10	$ 55,000.00	$ 220,000.00	$ 22,000.00
Chlorine Pumps	1	0	10	$ 24,000.00	$ 24,000.00	$ 2,400.00
Electrical	1	0	15	$ 159,400.00	$ 159,400.00	$ 10,626.67
Valves	20	0	20	$ 1,500.00	$ 30,000.00	(>15 years)
Storage Tank	1	0	40	$ 140,000.00	$ 140,000.00	(>15 years)
Water Treatment Building	1	0	40	$ 180,000.00	$ 180,000.00	(>15 years)
Piping	1	0	40	$ 580,500.00	$ 580,500.00	(>15 years)
					Total Annual SLA:	**$ 35,026.67**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Well Pump Replacement	4	0	10	$ 55,000.00	$ 220,000.00	$ -
Chlorine Pumps	1	0	10	$ 24,000.00	$ 24,000.00	$ -
Electrical	1	0	15	$ 159,400.00	$ 159,400.00	$ 106,798.00
Valves	20	0	20	$ 1,500.00	$ 30,000.00	$ -
Storage Tank	1	0	40	$ 140,000.00	$ 140,000.00	$ 70,000.00
Water Treatment Building	1	0	40	$ 180,000.00	$ 180,000.00	$ 90,000.00
Piping	1	0	40	$ 580,500.00	$ 580,500.00	$ 290,250.00
					Total Salvage Value:	**$ 557,048.00**

Key

EA - Each
LS - Lump Sum
LF - Lineal Feet
SY - Square Yard

Tippecanoe County
Americus Fire Flow Water Distribution System

Cost Estimate - Water Supply - Americus Fire Flow Alternative				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 10,000	$ 10,000
Mobilization/Demobilization (3%)	LS	1	$ 151,980	$ 151,980
Water Supply Costs				
8-inch Well (100 gpm capacity)	EA	4	$ 200,000	$ 800,000
Water Main, PVC, 2"	LF	350	$ 60	$ 21,000
Well House	EA	4	$ 25,000	$ 100,000
Elevated Storage Tank (310,000 gal)	EA	1	$ 1,206,000	$ 1,206,000
Filtration	EA	1	$ 324,000	$ 324,000
Chlorine Storage Tank	EA	1	$ 30,000	$ 30,000
Chlorine Pump System	EA	1	$ 24,000	$ 24,000
Water Treatment Building	EA	1	$ 200,000	$ 200,000
Electrical Connect and Panel	LS	1	$ 194,850	$ 194,900
Backup Generator	EA	1	$ 30,000	$ 30,000
Surface Restoration	LS	1	$ 8,000	$ 8,000
Pollution, Erosion and Sediment Control	LS	1	$ 12,000	$ 12,000
Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
10" Watermain	LF	19,705	$ 72	$ 1,418,800
Water Service Connections	EA	142	$ 3,500	$ 497,000
Valves	EA	28	$ 1,500	$ 42,000
Hydrant Assembly	EA	18	$ 3,750	$ 67,500
Tees, Crosses, and other Fittings	EA	80	$ 650	$ 52,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	19,705	$ 1	$ 19,800
Water Distribution Construction Subtotal				**$ 5,066,000**
Contingency (20%)				**$ 1,013,200**
Construction Total				**$ 6,079,200**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 729,600	$ 729,600
Resident Project Representation	LS	1	$ 364,800	$ 364,800
Local Council	LS	1	$ 60,792	$ 60,800
Bond Council	LS	1	$ 91,188	$ 91,200
Land Acquisition	LS	3	$ 9,000	$ 27,000
Financial	LS	1	$ 60,792	$ 60,800
Non-Construction Total				**$ 1,334,200**
Alternative Total Cost				**$ 7,413,400**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Annual Well Inspection	1	LS	$ 375.00	$ 375.00
Well Pump Power	1	LS	$ 10,000.00	$ 10,000.00
Water Treatment Power	1	LS	$ 1,000.00	$ 1,000.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 60,000.00	$ 60,000.00
				$ -
			Total Annual O&M:	**$ 71,400**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Well Pump Replacement	4	0	10	$ 65,000.00	$ 260,000.00	$ 26,000.00
Chlorine Pumps	1	0	10	$ 24,000.00	$ 24,000.00	$ 2,400.00
Electrical	1	0	15	$ 224,900.00	$ 224,900.00	$ 14,993.33
Valves	28	0	20	$ 1,500.00	$ 42,000.00	(>15 years)
Storage Tank	1	0	40	$ 1,236,000.00	$ 1,236,000.00	(>15 years)
Water Treatment Building	1	0	40	$ 200,000.00	$ 200,000.00	(>15 years)
Piping	1	0	40	$ 1,439,800.00	$ 1,439,800.00	(>15 years)
					Total Annual SLA:	**$ 43,393.33**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Well Pump Replacement	4	0	10	$ 65,000.00	$ 260,000.00	$ -
Chlorine Pumps	1	0	10	$ 24,000.00	$ 24,000.00	$ -
Electrical	1	0	15	$ 224,900.00	$ 224,900.00	$ 150,683.00
Valves	28	0	20	$ 1,500.00	$ 42,000.00	$ -
Storage Tank	1	0	40	$ 1,236,000.00	$ 1,236,000.00	$ 618,000.00
Water Treatment Building	1	0	40	$ 200,000.00	$ 200,000.00	$ 100,000.00
Piping	1	0	40	$ 1,439,800.00	$ 1,439,800.00	$ 719,900.00
					Total Salvage Value:	**$ 1,588,583.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
SY - Square Yard

Tippecanoe County
Americus Peak Flow Water Distribution System

Cost Estimate - Water Supply - Americus Peak Flow Alternative				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 10,000	$ 10,000
Mobilization/Demobilization (3%)	LS	1	$ 89,610	$ 89,610
Water Supply Costs				
8-inch Well (100 gpm capacity)	EA	2	$ 150,000	$ 300,000
Water Main, PVC, 2"	LF	350	$ 60	$ 21,000
Well House	EA	2	$ 25,000	$ 50,000
Ground Storage Tank (52,000 gal)	EA	1	$ 150,000	$ 150,000
Booster Pump Station	EA	1	$ 170,000	$ 170,000
Filtration	EA	1	$ 324,000	$ 324,000
Chlorine Storage Tank	EA	1	$ 30,000	$ 30,000
Chlorine Pump System	EA	1	$ 24,000	$ 24,000
Water Treatment Building	EA	1	$ 180,000	$ 180,000
Electrical Connect and Panel	LS	1	$ 137,850	$ 137,900
Backup Generator	EA	1	$ 30,000	$ 30,000
Surface Restoration	LS	1	$ 8,000	$ 8,000
Pollution, Erosion and Sediment Control	LS	1	$ 12,000	$ 12,000
Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
4" Watermain	LF	19,705	$ 45	$ 886,800
Water Service Connections	EA	142	$ 3,500	$ 497,000
Valves	EA	28	$ 1,500	$ 42,000
Hydrant Assembly	EA	10	$ 3,750	$ 37,500
Tees, Crosses, and other Fittings	EA	80	$ 600	$ 48,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	19,705	$ 1	$ 19,800
Water Distribution Construction Subtotal				**$ 2,987,000**
Contingency (20%)				**$ 597,400**
Construction Total				**$ 3,584,400**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 430,200	$ 430,200
Resident Project Representation	LS	1	$ 215,100	$ 215,100
Local Council	LS	1	$ 35,844	$ 35,900
Bond Council	LS	1	$ 53,766	$ 53,800
Land Acquisition	LS	3	$ 9,000	$ 27,000
Financial	LS	1	$ 35,844	$ 35,900
Non-Construction Total				**$ 797,900**
Alternative Total Cost				**$ 4,382,300**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Annual Well Inspection	1	LS	$ 375.00	$ 375.00
Well Pump Power	1	LS	$ 10,000.00	$ 10,000.00
Water Treatment Power	1	LS	$ 1,000.00	$ 1,000.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 60,000.00	$ 60,000.00
				$ -
			Total Annual O&M:	**$ 71,400**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Well Pump Replacement	2	0	10	$ 65,000.00	$ 130,000.00	$ 13,000.00
Chlorine Pumps	1	0	10	$ 24,000.00	$ 24,000.00	$ 2,400.00
Electrical	1	0	15	$ 167,900.00	$ 167,900.00	$ 11,193.33
Valves	28	0	20	$ 1,500.00	$ 42,000.00	(>15 years)
Storage Tank	1	0	40	$ 180,000.00	$ 180,000.00	(>15 years)
Water Treatment Building	1	0	40	$ 180,000.00	$ 180,000.00	(>15 years)
Piping	1	0	40	$ 907,800.00	$ 907,800.00	(>15 years)
					Total Annual SLA:	**$ 26,593.33**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Well Pump Replacement	2	0	10	$ 65,000.00	$ 130,000.00	$ -
Chlorine Pumps	1	0	10	$ 24,000.00	$ 24,000.00	$ -
Electrical	1	0	15	$ 167,900.00	$ 167,900.00	$ 112,493.00
Valves	28	0	20	$ 1,500.00	$ 42,000.00	$ -
Storage Tank	1	0	40	$ 180,000.00	$ 180,000.00	$ 90,000.00
Water Treatment Building	1	0	40	$ 180,000.00	$ 180,000.00	$ 90,000.00
Piping	1	0	40	$ 907,800.00	$ 907,800.00	$ 453,900.00
					Total Salvage Value:	**$ 746,393.00**

Key

EA - Each
LS - Lump Sum
LF - Lineal Feet
SY - Square Yard

Tippecanoe County
Colburn Fire Flow Water Distribution System

Cost Estimate - Water Supply - Colburn Fire Flow Alternative				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 10,000	$ 10,000
Mobilization/Demobilization (3%)	LS	1	$ 104,310	$ 104,310
Water Supply Costs				
8-inch Well (75 gpm capacity)	EA	4	$ 150,000	$ 600,000
Water Main, PVC, 2"	LF	350	$ 60	$ 21,000
Well House	EA	4	$ 25,000	$ 100,000
Elevated Storage Tank (120,000 gal)	EA	1	$ 780,000	$ 780,000
Filtration	EA	1	$ 307,200	$ 307,200
Chlorine Storage Tank	EA	1	$ 30,000	$ 30,000
Chlorine Pump System	EA	1	$ 24,000	$ 24,000
Water Treatment Building	EA	1	$ 200,000	$ 200,000
Electrical Connect and Panel	LS	1	$ 162,330	$ 162,400
Backup Generator	EA	1	$ 30,000	$ 30,000
Surface Restoration	LS	1	$ 8,000	$ 8,000
Pollution, Erosion and Sediment Control	LS	1	$ 12,000	$ 12,000
Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
8" Watermain	LF	11,960	$ 65	$ 777,400
Bore Under Railroad	LF	75	$ 500	$ 37,500
Water Service Connections	EA	65	$ 3,500	$ 227,500
Valves	EA	20	$ 1,500	$ 30,000
Hydrant Assembly	EA	16	$ 3,750	$ 60,000
Tees, Crosses, and other Fittings	EA	60	$ 650	$ 39,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	11,960	$ 1	$ 12,000
Water Distribution Construction Subtotal				**$ 3,477,000**
Contingency (20%)				**$ 695,400**
Construction Total				**$ 4,172,400**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 500,700	$ 500,700
Resident Project Representation	LS	1	$ 250,400	$ 250,400
Local Council	LS	1	$ 41,724	$ 41,800
Bond Council	LS	1	$ 62,586	$ 62,600
Land Acquisition	LS	3	$ 9,000	$ 27,000
Financial	LS	1	$ 41,724	$ 41,800
Non-Construction Total				**$ 924,300**
Alternative Total Cost				**$ 5,096,700**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Annual Well Inspection	1	LS	$ 375.00	$ 375.00
Well Pump Power	1	LS	$ 8,500.00	$ 8,500.00
Water Treatment Power	1	LS	$ 1,000.00	$ 1,000.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 60,000.00	$ 60,000.00
				$ -
			Total Annual O&M:	**$ 69,900**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Well Pump Replacement	4	0	10	$ 55,000.00	$ 220,000.00	$ 22,000.00
Chlorine Pumps	1	0	10	$ 24,000.00	$ 24,000.00	$ 2,400.00
Electrical	1	0	15	$ 192,400.00	$ 192,400.00	$ 12,826.67
Air Release Valves	20	0	20	$ 1,500.00	$ 30,000.00	(>15 years)
Storage Tank	1	0	40	$ 810,000.00	$ 810,000.00	(>15 years)
Water Treatment Building	1	0	40	$ 200,000.00	$ 200,000.00	(>15 years)
Piping	1	0	40	$ 835,900.00	$ 835,900.00	(>15 years)
					Total Annual SLA:	**$ 37,226.67**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Well Pump Replacement	4	0	10	$ 55,000.00	$ 220,000.00	$ -
Chlorine Pumps	1	0	10	$ 24,000.00	$ 24,000.00	$ -
Electrical	1	0	15	$ 192,400.00	$ 192,400.00	$ 128,908.00
Air Release Valves	20	0	20	$ 1,500.00	$ 30,000.00	$ -
Storage Tank	1	0	40	$ 810,000.00	$ 810,000.00	$ 405,000.00
Water Treatment Building	1	0	40	$ 200,000.00	$ 200,000.00	$ 100,000.00
Piping	1	0	40	$ 835,900.00	$ 835,900.00	$ 417,950.00
					Total Salvage Value:	**$ 1,051,858.00**

Key

EA - Each
LS - Lump Sum
LF - Lineal Feet
SY - Square Yard

Tippecanoe County
Colburn Peak Flow Water Distribution System

Cost Estimate - Water Supply - Colburn Peak Flow Alternative				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 10,000	$ 10,000
Mobilization/Demobilization (3%)	LS	1	$ 67,383	$ 67,383
Water Supply Costs				
8-inch Well (75 gpm capacity)	EA	2	$ 150,000	$ 300,000
Water Main, PVC, 2"	LF	350	$ 60	$ 21,000
Well House	EA	2	$ 25,000	$ 50,000
Booster Pump Station	EA	1	$ 130,000	$ 130,000
Ground Storage Tank (36,000 gal)	EA	1	$ 110,000	$ 110,000
Filtration	EA	1	$ 307,200	$ 307,200
Chlorine Storage Tank	EA	1	$ 30,000	$ 30,000
Chlorine Pump System	EA	1	$ 24,000	$ 24,000
Water Treatment Building	EA	1	$ 180,000	$ 180,000
Electrical Connect and Panel	LS	1	$ 129,330	$ 129,400
Backup Generator	EA	1	$ 30,000	$ 30,000
Surface Restoration	LS	1	$ 8,000	$ 8,000
Pollution, Erosion and Sediment Control	LS	1	$ 12,000	$ 12,000
Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
4" Watermain	LF	11,960	$ 45	$ 538,200
Bore Under Railroad	LF	75	$ 500	$ 37,500
Water Service Connections	EA	65	$ 3,500	$ 227,500
Valves	EA	20	$ 1,500	$ 30,000
Hydrant Assembly	EA	3	$ 3,750	$ 11,300
Tees, Crosses, and other Fittings	EA	60	$ 650	$ 39,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	11,960	$ 1	$ 12,000
Water Distribution Construction Subtotal				**$ 2,246,100**
Contingency (20%)				**$ 449,300**
Construction Total				**$ 2,695,400**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 323,500	$ 323,500
Resident Project Representation	LS	1	$ 161,800	$ 161,800
Local Council	LS	1	$ 26,954	$ 27,000
Bond Council	LS	1	$ 40,431	$ 40,500
Land Acquisition	LS	3	$ 9,000	$ 27,000
Financial	LS	1	$ 26,954	$ 27,000
Non-Construction Total				**$ 606,800**
Alternative Total Cost				**$ 3,302,200**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Annual Well Inspection	1	LS	$ 375.00	$ 375.00
Well Pump Power	1	LS	$ 8,500.00	$ 8,500.00
Water Treatment Power	1	LS	$ 1,000.00	$ 1,000.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 60,000.00	$ 60,000.00
				$ -
			Total Annual O&M:	**$ 69,900**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Well Pump Replacement	2	0	10	$ 55,000.00	$ 110,000.00	$ 11,000.00
Chlorine Pumps	1	0	10	$ 24,000.00	$ 24,000.00	$ 2,400.00
Electrical	1	0	15	$ 159,400.00	$ 159,400.00	$ 10,626.67
Air Release Valves	20	0	20	$ 1,500.00	$ 30,000.00	(>15 years)
Storage Tank	1	0	40	$ 140,000.00	$ 140,000.00	(>15 years)
Water Treatment Building	1	0	40	$ 180,000.00	$ 180,000.00	(>15 years)
Piping	1	0	40	$ 596,700.00	$ 596,700.00	(>15 years)
					Total Annual SLA:	**$ 24,026.67**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Well Pump Replacement	2	0	10	$ 55,000.00	$ 110,000.00	$ -
Chlorine Pumps	1	0	10	$ 24,000.00	$ 24,000.00	$ -
Electrical	1	0	15	$ 159,400.00	$ 159,400.00	$ 106,798.00
Air Release Valves	20	0	20	$ 1,500.00	$ 30,000.00	$ -
Storage Tank	1	0	40	$ 140,000.00	$ 140,000.00	$ 70,000.00
Water Treatment Building	1	0	40	$ 180,000.00	$ 180,000.00	$ 90,000.00
Piping	1	0	40	$ 596,700.00	$ 596,700.00	$ 298,350.00
					Total Salvage Value:	**$ 565,148.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
SY - Square Yard

Tippecanoe County
Centralized Fire Flow Water Distribution System

Cost Estimate - Water Supply - Centralized Fire Flow Alternative				
Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 10,000	$ 10,000
Mobilization/Demobilization (3%)	LS	1	$ 387,417	$ 387,417
Water Treatment Costs				
12-inch Well (250 gpm capacity)	EA	4	$ 350,000	$ 1,400,000
Water Main, PVC, 2"	LF	350	$ 60	$ 21,000
Well House	EA	4	$ 25,000	$ 100,000
Filtration	EA	1	$ 414,000	$ 414,000
Chlorine Storage Tank	EA	1	$ 75,000	$ 75,000
Chlorine Pump System	EA	1	$ 24,000	$ 24,000
Water Treatment Building	EA	1	$ 300,000	$ 300,000
Electrical Connect and Panel	EA	1	$ 305,100	$ 305,100
Backup Generator	EA	1	$ 60,000	$ 60,000
Surface Restoration	LS	1	$ 8,000	$ 8,000
Pollution, Erosion and Sediment Control	LS	1	$ 12,000	$ 12,000
Water Transport Costs				
Water Supply Pump Station	LS	1	$ 250,000	$ 250,000
Electrical, Instrumentation, and Controls	LS	1	$ 37,500	$ 37,500
Conveyance 8" Watermain to Buck Creek	LF	11580	$ 80	$ 926,400
Conveyance 8"Watermain to Americus	LF	1300	$ 80	$ 104,000
Conveyance 8" Watermain to Colburn	LF	11750	$ 80	$ 940,000
Combined Conveyance 8" Watermain to Buck Creek and Colburn	LF	1360	$ 80	$ 108,800
Bore Under Hwy 25 (to Buck Creek)	LF	275	$ 500	$ 137,500
Bore Under Hwy 25 (to Colburn)	LF	275	$ 500	$ 137,500
Tees, Crosses, and other Fittings	EA	140	$ 700	$ 98,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	25,990	$ 1	$ 26,000
Buck Creek Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
Elevated Storage Tank (210,000 gal)	EA	1	$ 990,000	$ 990,000
8" Watermain	LF	11,600	$ 65	$ 754,000
Bore Under Railroad	LF	75	$ 500	$ 37,500
Water Service Connections	EA	64	$ 3,500	$ 224,000
Valves	EA	20	$ 1,500	$ 30,000
Hydrant Assembly	EA	15	$ 3,750	$ 56,300
Tees, Crosses, and other Fittings	EA	80	$ 650	$ 52,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	11,600	$ 1	$ 11,600
Americus Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
Elevated Storage Tank (310,000 gal)	EA	1	$ 1,206,000	$ 1,206,000
10" Watermain	LF	19,705	$ 72	$ 1,418,800
Water Service Connections	EA	142	$ 3,500	$ 497,000
Valves	EA	28	$ 1,500	$ 42,000
Hydrant Assembly	EA	18	$ 3,750	$ 67,500
Tees, Crosses, and other Fittings	EA	80	$ 650	$ 52,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	19,705	$ 1	$ 19,800
Colburn Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
Elevated Storage Tank (120,000 gal)	EA	1	$ 780,000	$ 780,000
6" Watermain	LF	11,960	$ 60	$ 717,600
Bore Under Railroad	LF	75	$ 500	$ 37,500
Water Service Connections	EA	65	$ 3,500	$ 227,500
Valves	EA	20	$ 1,500	$ 30,000
Hydrant Assembly	EA	16	$ 3,750	$ 60,000
Tees, Crosses, and other Fittings	EA	60	$ 650	$ 39,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	11,960	$ 1	$ 12,000
Construction Subtotal				**$ 13,311,400**
Contingency (20%)				**$ 2,662,300**
Construction Total				**$ 15,973,700**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 1,916,900	$ 1,916,900
Resident Project Representation	LS	1	$ 958,500	$ 958,500
Local Council	LS	1	$ 159,737	$ 159,800
Bond Council	LS	1	$ 239,606	$ 239,700
Land Acquisition	LS	4	$ 9,000	$ 36,000
Financial	LS	1	$ 159,737	$ 159,800
Non-Construction Total				**$ 3,470,700**
Alternative Total Cost				**$ 19,444,400**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Annual Well Inspection	1	LS	$ 375.00	$ 375.00
Well Pump Power	1	LS	$ 15,000.00	$ 15,000.00
Water Treatment Power	1	LS	$ 1,000.00	$ 1,000.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 60,000.00	$ 60,000.00
				$ -
			Total Annual O&M:	**$ 76,400**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Well Pump Replacement	4	0	10	$ 85,000.00	$ 340,000.00	$ 34,000.00
Chlorine Pumps	1	0	10	$ 24,000.00	$ 24,000.00	$ 2,400.00
Electrical	1	0	15	$ 402,600.00	$ 402,600.00	$ 26,840.00
Valves	68	0	20	$ 1,500.00	$ 102,000.00	(>15 years)
Storage Tank	1	0	40	$ 2,976,000.00	$ 2,976,000.00	(>15 years)
Water Treatment Building	1	0	40	$ 300,000.00	$ 300,000.00	(>15 years)
Piping	1	0	40	$ 5,319,600.00	$ 5,319,600.00	(>15 years)
					Total Annual SLA:	**$ 63,240.00**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Well Pump Replacement	64	0	10	$ 85,000.00	$ 5,440,000.00	$ -
Chlorine Pumps	1	0	10	$ 24,000.00	$ 24,000.00	$ -
Electrical	1	0	15	$ 402,600.00	$ 402,600.00	$ 269,742.00
Valves	68	0	20	$ 1,500.00	$ 102,000.00	$ -
Storage Tank	1	0	40	$ 2,976,000.00	$ 2,976,000.00	$ 1,488,000.00
Water Treatment Building	1	0	40	$ 300,000.00	$ 300,000.00	$ 150,000.00
Piping	1	0	40	$ 5,319,600.00	$ 5,319,600.00	$ 2,659,800.00
					Total Salvage Value:	**$ 4,567,542.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
SY - Square Yard

Tippecanoe County
Centralized Peak Flow Water Distribution System

Cost Estimate - Water Supply - Centralized Peak Flow Alternative				
Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 10,000	$ 10,000
Mobilization/Demobilization (3%)	LS	1	$ 249,369	$ 249,369
Water Treatment Costs				
12-inch Well (250 gpm capacity)	EA	2	$ 350,000	$ 700,000
Water Main, PVC, 2"	LF	350	$ 60	$ 21,000
Well House	EA	2	$ 25,000	$ 50,000
Ground Storage Tank (125,000 gal)	EA	1	$ 275,000	$ 275,000
Booster Pump Station	EA	1	$ 210,000	$ 210,000
Filtration	EA	1	$ 324,000	$ 324,000
Chlorine Storage Tank	EA	1	$ 70,000	$ 70,000
Chlorine Pump System	EA	1	$ 24,000	$ 24,000
Water Treatment Building	EA	1	$ 250,000	$ 250,000
Electrical Connect and Panel	EA	1	$ 178,350	$ 178,400
Backup Generator	EA	1	$ 50,000	$ 50,000
Surface Restoration	LS	1	$ 8,000	$ 8,000
Pollution, Erosion and Sediment Control	LS	1	$ 12,000	$ 12,000
Water Transport Costs				
Water Supply Pump Station	LS	1	$ 250,000	$ 250,000
Electrical, Instrumentation, and Controls	LS	1	$ 37,500	$ 37,500
Converyance 8" Watermain to Buck Creek	LF	11580	$ 80	$ 926,400
Conveyance 8" Watermain to Americus	LF	1300	$ 80	$ 104,000
Conveyance 8" Watermain to Colburn	LF	11750	$ 80	$ 940,000
Combined Conveyance 8" Watermain to Buck Creek and Colburn	LF	1360	$ 80	$ 108,800
Bore Under Hwy 25 (to Buck Creek)	LF	275	$ 500	$ 137,500
Bore Under Hwy 25 (to Colburn)	LF	275	$ 500	$ 137,500
Tees, Crosses, and other Fittings	EA	140	$ 700	$ 98,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	25,990	$ 1	$ 26,000
Buck Creek Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
4" Watermain	LF	11,600	$ 45	$ 522,000
Bore Under Railroad	LF	75	$ 500	$ 37,500
Water Service Connections	EA	64	$ 3,500	$ 224,000
Valves	EA	20	$ 1,500	$ 30,000
Hydrant Assembly	EA	2	$ 3,750	$ 7,500
Tees, Crosses, and other Fittings	EA	80	$ 600	$ 48,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	11,600	$ 1	$ 11,600
Americus Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
4" Watermain	LF	19,705	$ 45	$ 886,800
Water Service Connections	EA	142	$ 3,500	$ 497,000
Valves	EA	28	$ 1,500	$ 42,000
Hydrant Assembly	EA	10	$ 3,750	$ 37,500
Tees, Crosses, and other Fittings	EA	80	$ 600	$ 48,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	19,705	$ 1	$ 19,800
Colburn Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
4" Watermain	LF	11,960	$ 45	$ 538,200
Bore Under Railroad	LF	75	$ 500	$ 37,500
Water Service Connections	EA	65	$ 3,500	$ 227,500
Valves	EA	20	$ 1,500	$ 30,000
Hydrant Assembly	EA	3	$ 3,750	$ 11,300
Tees, Crosses, and other Fittings	EA	60	$ 650	$ 39,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	11,960	$ 1	$ 12,000
Construction Subtotal				**$ 8,571,700**
Contingency (20%)				**$ 1,714,400**
Construction Total				**$ 10,286,100**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 1,234,400	$ 1,234,400
Resident Project Representation	LS	1	$ 617,200	$ 617,200
Local Council	LS	1	$ 102,861	$ 102,900
Bond Council	LS	1	$ 154,292	$ 154,300
Land Acquisition	LS	4	$ 9,000	$ 36,000
Financial	LS	1	$ 102,861	$ 102,900
Non-Construction Total				**$ 2,247,700**
Alternative Total Cost				**$ 12,533,800**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Annual Well Inspection	1	LS	$ 375.00	$ 375.00
Well Pump Power	1	LS	$ 15,000.00	$ 15,000.00
Water Treatment Power	1	LS	$ 1,000.00	$ 1,000.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 60,000.00	$ 60,000.00
				$ -
			Total Annual O&M:	**$ 76,400**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Well Pump Replacement	2	0	10	$ 85,000.00	$ 170,000.00	$ 17,000.00
Chlorine Pumps		0	10	$ 24,000.00	$ -	$ -
Electrical	1	0	15	$ 265,900.00	$ 265,900.00	$ 17,726.67
Valves	68	0	20	$ 1,500.00	$ 102,000.00	(>15 years)
Storage Tank	1	0	40	$ 275,000.00	$ 275,000.00	(>15 years)
Water Treatment Building	1	0	40	$ 250,000.00	$ 250,000.00	(>15 years)
Piping	1	0	40	$ 4,376,200.00	$ 4,376,200.00	(>15 years)
					Total Annual SLA:	**$ 34,726.67**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Well Pump Replacement	64	0	10	$ 85,000.00	$ 5,440,000.00	$ -
Chlorine Pumps	0	0	10	$ 24,000.00	$ -	$ -
Electrical	1	0	15	$ 265,900.00	$ 265,900.00	$ 178,153.00
Valves	68	0	20	$ 1,500.00	$ 102,000.00	$ -
Storage Tank	1	0	40	$ 275,000.00	$ 275,000.00	$ 137,500.00
Water Treatment Building	1	0	40	$ 250,000.00	$ 250,000.00	$ 125,000.00
Piping	1	0	40	$ 4,376,200.00	$ 4,376,200.00	$ 2,188,100.00
					Total Salvage Value:	**$ 2,628,753.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
SY - Square Yard

Tippecanoe County
Regionalized Lafayette Water Distribution System

Cost Estimate - Water Supply - Regionalized Lafayette Alternative				
Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 10,000	$ 10,000
Mobilization/Demobilization (3%)	LS	1	$ 408,090	$ 408,090
Water Transport Costs				
Water Supply Pump Station	LS	1	$ 250,000	$ 250,000
Electrical, Instrumentation, and Controls	LS	1	$ 37,500	$ 37,500
Conveyance 10" Watermain from Lafayette to Buck Creek	LF	33600	$ 85	$ 2,856,000
Conveyance Watermain to Buck Creek	LF	0	$ 80	$ -
Conveyance 8" Watermain to Americus	LF	2500	$ 80	$ 200,000
Conveyance 8" Watermain to Colburn	LF	11750	$ 80	$ 940,000
Combined Conveyance 8" Watermain to Americus and Colburn	LF	11580	$ 85	$ 984,300
Bore Under Hwy 25 (to Buck Creek)	LF	275	$ 500	$ 137,500
Bore Under Hwy 25 (to Colburn)	LF	275	$ 500	$ 137,500
Tees, Crosses, and other Fittings	EA	450	$ 700	$ 315,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	25,830	$ 1	$ 25,900
Buck Creek Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
8" Watermain	LF	11,630	$ 65	$ 756,000
Elevated Storage Tank (210,000 gal)	EA	1	$ 990,000	$ 990,000
Bore Under Railroad	LF	75	$ 500	$ 37,500
Water Service Connections	EA	64	$ 3,500	$ 224,000
Valves	EA	40	$ 1,500	$ 60,000
Hydrant Assembly	EA	29	$ 3,750	$ 108,800
Tees, Crosses, and other Fittings	EA	116	$ 650	$ 75,400
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	11,630	$ 1	$ 11,700
Americus Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
10" Watermain	LF	19,705	$ 72	$ 1,418,800
Elevated Storage Tank (310,000 gal)	EA	1	$ 1,206,000	$ 1,206,000
Water Service Connections	EA	142	$ 3,500	$ 497,000
Valves	EA	28	$ 1,500	$ 42,000
Hydrant Assembly	EA	18	$ 3,750	$ 67,500
Tees, Crosses, and other Fittings	EA	80	$ 650	$ 52,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	19,705	$ 1	$ 19,800
Colburn Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
8" Watermain	LF	11,960	$ 65	$ 777,400
Elevated Storage Tank (120,000 gal)	EA	1	$ 780,000	$ 780,000
Bore Under Railroad	LF	75	$ 500	$ 37,500
Water Service Connections	EA	65	$ 3,500	$ 227,500
Valves	EA	41	$ 1,500	$ 61,500
Hydrant Assembly	EA	30	$ 3,750	$ 112,500
Tees, Crosses, and other Fittings	EA	119	$ 650	$ 77,400
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	11,960	$ 1	$ 12,000
Construction Subtotal				**$ 14,021,100**
Contingency (20%)				**$ 2,804,300**
Construction Total				**$ 16,825,400**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 2,019,100	$ 2,019,100
Resident Project Representation	LS	1	$ 1,009,600	$ 1,009,600
Local Council	LS	1	$ 168,254	$ 168,300
Bond Council	LS	1	$ 252,381	$ 252,400
Land Acquisition	LS	0	$ 9,000	$ -
Financial	LS	1	$ 168,254	$ 168,300
Non-Construction Total				**$ 3,617,700**
Alternative Total Cost				**$ 20,443,100**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Booster Pump Power	1	LS	$ 10,000.00	$ 10,000.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 60,000.00	$ 60,000.00
Annual Water Usage Rates	1	LS	$ 99,307.00	$ 99,307.00
				$ -
			Total Annual O&M:	**$ 169,400**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Booster Pump Replacement	1	0	10	$ 100,000.00	$ 100,000.00	$ 10,000.00
Electrical	1	0	15	$ 37,500.00	$ 37,500.00	$ 2,500.00
Valves	109	0	20	$ 1,500.00	$ 163,500.00	(>15 years)
Storage Tank	1	0	40	$ 2,976,000.00	$ 2,976,000.00	(>15 years)
Piping	1	0	40	$ 8,282,500.00	$ 8,282,500.00	(>15 years)
Total Annual SLA:						**$ 12,500.00**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Well Pump Replacement	1	0	10	$ 100,000.00	$ 100,000.00	$ -
Electrical	1	0	15	$ 37,500.00	$ 37,500.00	$ 25,125.00
Valves	109	0	20	$ 1,500.00	$ 163,500.00	$ -
Storage Tank	1	0	40	$ 2,976,000.00	$ 2,976,000.00	$ 1,488,000.00
Piping	1	0	40	$ 8,282,500.00	$ 8,282,500.00	$ 4,141,250.00
Total Salvage Value:						**$ 5,654,375.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
SY - Square Yard

Tippecanoe County
Regionalized Delphi Water Distribution System

Cost Estimate - Water Supply - Regionalized Delphi Alternative				
Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 10,000	$ 10,000
Mobilization/Demobilization (3%)	LS	1	$ 391,503	$ 391,503
Water Transport Costs				
Water Supply Pump Station	LS	1	$ 250,000	$ 250,000
Electrical, Instrumentation, and Controls	LS	1	$ 37,500	$ 37,500
Conveyance 10" Watermain from Delphi to Americus	LF	29600	$ 85	$ 2,516,000
Conveyance 8" Watermain to Buck Creek	LF	11580	$ 80	$ 926,400
Conveyance Watermain to Americus	LF	0	$ 80	$ -
Conveyance 8" Watermain to Colburn	LF	11750	$ 80	$ 940,000
Combined Conveyance 8" Watermain to Buck Creek and Colburn	LF	1360	$ 85	$ 115,600
Bore Under Hwy 25 (to Buck Creek)	LF	275	$ 500	$ 137,500
Bore Under Hwy 25 (to Colburn)	LF	275	$ 500	$ 137,500
Tees, Crosses, and other Fittings	EA	350	$ 700	$ 245,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	24,690	$ 1	$ 24,700
Buck Creek Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
8" Watermain	LF	11,630	$ 65	$ 756,000
Elevated Storage Tank (210,000 gal)	EA	1	$ 990,000	$ 990,000
Bore Under Railroad	LF	75	$ 500	$ 37,500
Water Service Connections	EA	64	$ 3,500	$ 224,000
Valves	EA	40	$ 1,500	$ 60,000
Hydrant Assembly	EA	29	$ 3,750	$ 108,800
Tees, Crosses, and other Fittings	EA	116	$ 650	$ 75,400
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	11,630	$ 1	$ 11,700
Americus Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
10" Watermain	LF	19,705	$ 72	$ 1,418,800
Elevated Storage Tank (310,000 gal)	EA	1	$ 1,206,000	$ 1,206,000
Water Service Connections	EA	142	$ 3,500	$ 497,000
Valves	EA	28	$ 1,500	$ 42,000
Hydrant Assembly	EA	18	$ 3,750	$ 67,500
Tees, Crosses, and other Fittings	EA	80	$ 650	$ 52,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	19,705	$ 1	$ 19,800
Colburn Water Distribution Costs				
Maintenance of Traffic	LS	1	$ 9,000	$ 9,000
8" Watermain	LF	11,960	$ 65	$ 777,400
Elevated Storage Tank (120,000 gal)	EA	1	$ 780,000	$ 780,000
Bore Under Railroad	LF	75	$ 500	$ 37,500
Water Service Connections	EA	65	$ 3,500	$ 227,500
Valves	EA	41	$ 1,500	$ 61,500
Hydrant Assembly	EA	30	$ 3,750	$ 112,500
Tees, Crosses, and other Fittings	EA	120	$ 650	$ 78,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	11,960	$ 1	$ 12,000
Construction Subtotal				**$ 13,451,700**
Contingency (20%)				**$ 2,690,400**
Construction Total				**$ 16,142,100**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 1,937,100	$ 1,937,100
Resident Project Representation	LS	1	$ 968,600	$ 968,600
Local Council	LS	1	$ 161,421	$ 161,500
Bond Council	LS	1	$ 242,132	$ 242,200
Land Acquisition	LS	0	$ 9,000	$ -
Financial	LS	1	$ 161,421	$ 161,500
Non-Construction Total				**$ 3,470,900**
Alternative Total Cost				**$ 19,613,000**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Booster Pump Power	1	LS	$ 10,000.00	$ 10,000.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 60,000.00	$ 60,000.00
Annual Water Usage Rates	1	LS	$ 182,598.00	$ 182,598.00
				$ -
			Total Annual O&M:	**$ 252,600**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Well Pump Replacement	1	0	10	$ 100,000.00	$ 100,000.00	$ 10,000.00
Electrical	1	0	15	$ 37,500.00	$ 37,500.00	$ 2,500.00
Valves	109	0	20	$ 1,500.00	$ 163,500.00	(>15 years)
Storage Tanks	1	0	40	$ 2,976,000.00	$ 2,976,000.00	(>15 years)
Piping	1	0	40	$ 7,800,200.00	$ 7,800,200.00	(>15 years)
					Total Annual SLA:	**$ 12,500.00**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Well Pump Replacement	1	0	10	$ 100,000.00	$ 100,000.00	$ -
Electrical	1	0	15	$ 37,500.00	$ 37,500.00	$ 25,125.00
Valves	109	0	20	$ 1,500.00	$ 163,500.00	$ -
Storage Tank	1	0	40	$ 2,976,000.00	$ 2,976,000.00	$ 1,488,000.00
Piping	1	0	40	$ 7,800,200.00	$ 7,800,200.00	$ 3,900,100.00
					Total Salvage Value:	**$ 5,413,225.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
SY - Square Yard

Project: Tippecanoe County

Alternative	Const. Cost	20% Contingency	Non-Const. Cost	Total Project Cost	Annual O&M	Annual SLA's	Salvage Value
Local - Buck Creek Grinders	$ 1,815,300	$ 363,100	$ 477,600	$ 2,656,000	$ 62,800	$ 35,367	$ 297,963
Local - Buck Creek STEP	$ 2,017,600	$ 403,600	$ 559,500	$ 2,980,700	$ 55,000	$ 26,779	$ 319,284
Local - Americus Grinders	$ 3,108,300	$ 621,700	$ 811,000	$ 4,541,000	$ 73,400	$ 72,293	$ 561,908
Local - Americus STEP	$ 3,144,900	$ 629,000	$ 873,700	$ 4,647,600	$ 64,300	$ 52,231	$ 577,667
Local - Colburn Grinders	$ 1,799,000	$ 359,800	$ 473,300	$ 2,632,100	$ 62,100	$ 35,833	$ 305,825
Local - Colburn STEP	$ 2,004,600	$ 401,000	$ 550,900	$ 2,956,500	$ 55,200	$ 31,037	$ 320,376
Centralized - STEP to RMF	$ 7,214,600	$ 1,443,000	$ 1,998,200	$ 10,655,800	$ 121,500	$ 103,858	$ 1,574,729
Centralized - Package Plant	$ 6,147,000	$ 1,229,400	$ 1,595,100	$ 8,971,500	$ 133,400	$ 134,600	$ 1,403,560
Regionalized - Lafayette	$ 8,512,500	$ 1,702,500	$ 2,196,400	$ 12,411,400	$ 279,700	$ 99,451	$ 2,906,235
Regionalized - Delphi	$ 6,872,300	$ 1,374,500	$ 1,773,400	$ 10,020,200	$ 206,400	$ 81,218	$ 2,070,195

LIFE CYCLE COST ANALYSIS (Wastewater Alternatives)

Parameter	Localized - Buck Creek Grinders	Localized - Buck Creek STEP	Localized - Americus Grinders	Localized - Americus STEP	Localized - Colburn Grinders	Localized - Colburn STEP	Centralized - STEP to RMF	Centralized - Package Plant	Regionalized - Lafayette STEP	Regionalized - Delphi STEP	Regionalized - Lafayette Grinders	Regionalized - Delphi Grinders
Planning Period (years)	20	20	20	20	20	20	20	20	20	20	20	20
Real Discount Rate (%)	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Total Project Capital Cost	$ 2,656,000	$ 2,980,700	$ 4,541,000	$ 4,647,600	$ 2,632,100	$ 2,956,500	$ 10,655,800	$ 8,971,500	$ 12,411,400	$ 10,020,200	$ 12,024,900	$ 9,725,000
Annual Value Capital Cost	$ 132,800	$ 149,035	$ 227,050	$ 232,380	$ 131,605	$ 147,825	$ 532,790	$ 448,575	$ 620,570	$ 501,010	$ 601,245	$ 486,250
Present Value Capital Cost	**$ 2,656,000**	**$ 2,980,700**	**$ 4,541,000**	**$ 4,647,600**	**$ 2,632,100**	**$ 2,956,500**	**$ 10,655,800**	**$ 8,971,500**	**$ 12,411,400**	**$ 10,020,200**	**$ 12,024,900**	**$ 9,725,000**
Cost for O&M per Year	$ 62,800	$ 55,000	$ 73,400	$ 64,300	$ 62,100	$ 55,200	$ 121,500	$ 133,400	$ 279,700	$ 206,400	$ 249,000	$ 175,700
Present Value O&M Cost	**$ 1,192,410**	**$ 1,044,308**	**$ 1,393,677**	**$ 1,220,891**	**$ 1,179,119**	**$ 1,048,106**	**$ 2,306,971**	**$ 2,532,922**	**$ 5,310,781**	**$ 3,919,003**	**$ 4,727,867**	**$ 3,336,090**
Annual Equipment Replacement Cost	$ 35,367	$ 26,779	$ 72,293	$ 52,231	$ 35,833	$ 31,037	$ 103,858	$ 134,600	$ 99,451	$ 81,218	$ 123,767	$ 123,767
Present Value Eqmt. Repl. Cost	**$ 671,522**	**$ 508,458**	**$ 1,372,664**	**$ 991,722**	**$ 680,383**	**$ 589,306**	**$ 1,971,995**	**$ 2,555,707**	**$ 1,888,324**	**$ 1,542,120**	**$ 2,350,010**	**$ 2,350,010**
Salvage Value	**$ 297,963**	**$ 319,284**	**$ 561,908**	**$ 577,667**	**$ 305,825**	**$ 320,376**	**$ 1,574,729**	**$ 1,403,560**	**$ 2,906,235**	**$ 2,070,195**	**$ 2,763,860**	**$ 2,111,065**
Total Life Cycle Cost - Present Value	**$ 4,221,969**	**$ 4,214,182**	**$ 6,745,432**	**$ 6,282,546**	**$ 4,185,776**	**$ 4,273,536**	**$ 13,360,038**	**$ 12,656,568**	**$ 16,704,270**	**$ 13,411,129**	**$ 16,338,917**	**$ 13,300,034**

Key

STEP - Septic Tank Effluent Pump

Tippecanoe
Buck Creek Grinder Alternative

Cost Estimate - Buck Creek Collection System Alternative - Grinder Pump System				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 8,000	$ 8,000
Mobilization/Demobilization (3%)	LS	1	$ 52,638	$ 52,638
Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	8,045	$ 20	$ 160,900
3" Low Pressure Sewer - PVC	LF	9,075	$ 24	$ 217,800
Grinder Pump Assembly - Simplex	EA	64	$ 4,000	$ 256,000
Abandon Existing Septic Tank	EA	64	$ 420	$ 26,900
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	64	$ 270	$ 17,300
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 64,000	$ 64,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	17120	$ 1	$ 17,200
Treatment Costs				
Tankage - Concrete Slab	CY	66	$ 450	$ 29,700
Tankage - Concrete Walls	CY	74	$ 650	$ 48,100
Excavation for Tank	CY	132	$ 15	$ 2,000
Remove Surplus Dirt	CY	132	$ 8	$ 1,100
Package Plant	LS	1	$ 686,850	$ 686,900
Building for Blowers, Elec., I&C, lab	LS	1	$ 40,000	$ 40,000
Site Piping	LS	1	$ 16,500	$ 16,500
12" Outfall Piping	LF	80	$ 55	$ 4,400
Electrical, Instrumentation and Contols	LS	1	$ 82,500	$ 82,500
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	1,300	$ 1	$ 1,300
Construction Subtotal				**$ 1,815,300**
Contingency (20%)				**$ 363,100**
Construction Total				**$ 2,178,400**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 261,500	$ 261,500
Resident Project Representation	LS	1	$ 130,800	$ 130,800
Local Council	LS	1	$ 21,784	$ 21,800
Bond Council	LS	1	$ 32,676	$ 32,700
Land Acquisition	LS	1	$ 9,000	$ 9,000
Financial	LS	1	$ 21,784	$ 21,800
Non-Construction Total				**$ 477,600**
Alternative Total Cost				**$ 2,656,000**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Collection System Power	1	LS	$ 2,304.00	$ 2,304.00
Sample Collection Testing	1	LS	$ 23,000.00	$ 23,000.00
Treatment Power	1	LS	$ 1,000.00	$ 1,000.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 36,400.00	$ 36,400.00
				$ -
			Total Annual O&M:	**$ 62,800**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Grinder Pump Replacements	64	0	10	$ 4,000.00	$ 256,000.00	$ 25,600.00
Treatment System Pumps	1	0	20	$ 15,000.00	$ 15,000.00	(>15 years)
Electrical	1	0	15	$ 146,500.00	$ 146,500.00	$ 9,766.67
Isolation Valves	7	0	20	$ 750.00	$ 5,250.00	(>15 years)
Service Line Valves	64	0	20	$ 270.00	$ 17,280.00	(>15 years)
Air Release Valves	6	0	20	$ 2,900.00	$ 17,400.00	(>15 years)
Storage Tank	1	0	40	$ 15.00	$ 15.00	(>15 years)
Piping	1	0	40	$ 399,600.00	$ 399,600.00	(>15 years)
					Total Annual SLA:	**$ 35,366.67**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Grinder Pump Replacements	64	0	10	$ 4,000.00	$ 256,000.00	$ -
Treatment System Pumps	1	0	20	$ 15,000.00	$ 15,000.00	$ -
Electrical	1	0	15	$ 146,500.00	$ 146,500.00	$ 98,155.00
Isolation Valves	7	0	20	$ 750.00	$ 5,250.00	$ -
Service Line Valves	64	0	20	$ 270.00	$ 17,280.00	$ -
Air Release Valves	6	0	20	$ 2,900.00	$ 17,400.00	$ -
Storage Tank	1	0	40	$ 15.00	$ 15.00	$ 7.50
Piping	1	0	40	$ 399,600.00	$ 399,600.00	$ 199,800.00
					Total Salvage Value:	**$ 297,962.50**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
CY - Cubic Yard
SY - Square Yard

Tippecanoe
Buck Creek STEP Alternative

Cost Estimate - Buck Creek Collection System Alternative - STEP System				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 8,000	$ 8,000
Mobilization/Demobilization (3%)	LS	1	$ 58,532	$ 58,532
Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	8,045	$ 20	$ 160,900
3" Low Pressure Sewer - PVC	LF	9,075	$ 24	$ 217,800
Septic Tanks (1,200 gal. with Simplex)	EA	64	$ 4,950	$ 316,800
Abandon Existing Septic Tank	EA	64	$ 420	$ 26,900
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	64	$ 270	$ 17,300
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 64,000	$ 64,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	17,120	$ 1	$ 17,200
Treatment Costs				
Excavation and Backfill	CY	3,432	$ 25	$ 85,800
Liner	SF	17,238	$ 2	$ 34,476
Cell Media	CY	1,950	$ 30	$ 58,500
Recirculating Pump Station	EA	1	$ 30,000	$ 30,000
Sand Filter Manifolds	LF	390	$ 6	$ 2,340
Sand Filter Distribution Laterals	LF	12,792	$ 4	$ 51,168
Force Main	LF	312	$ 20	$ 6,240
Electrical, Instrumentation and Contols	LS	1	$ 80,000	$ 80,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	12,684	$ 2	$ 25,368
Disposal Costs (Sand Mounds)				
Dosing System	LS	1	$ 32,500	$ 32,500
Distribution Structure	EA	4	$ 3,500	$ 14,000
4" Force Main	LF	6,120	$ 42	$ 257,040
3" Manifold	LF	170	$ 20	$ 3,400
1 1/2" Piping	LF	5,150	$ 8	$ 41,200
Prepare Plowed Layer	SY	14,500	$ 3	$ 43,500
Aggregate Bed	CY	1,945	$ 35	$ 68,075
Sand	CY	3,384	$ 35	$ 118,440
Topsoil	CY	2,114	$ 30	$ 63,420
Electrical, Instrumentation and Contols	LS	1	$ 10,000	$ 10,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	12,684	$ 1	$ 12,684
Construction Subtotal				**$ 2,017,600**
Contingency (20%)				**$ 403,600**
Construction Total				**$ 2,421,200**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 290,600	$ 290,600
Resident Project Representation	LS	1	$ 145,300	$ 145,300
Local Council	LS	1	$ 24,212	$ 24,300
Bond Council	LS	1	$ 36,318	$ 36,400
Land Acquisition	LS	4	$ 9,000	$ 38,600
Financial	LS	1	$ 24,212	$ 24,300
Non-Construction Total				**$ 559,500**
Alternative Total Cost				**$ 2,980,700**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Collection System Power	1	LS	$ 2,304.00	$ 2,304.00
Sample Collection Testing	1	LS	$ 18,000.00	$ 18,000.00
Pump Tanks	1	LS	$ 4,053.33	$ 4,053.33
Treatment Power	1	LS	$ 800.00	$ 180.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 30,400.00	$ 30,400.00
				$ -
			Total Annual O&M:	**$ 55,000**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
STEP Pump Replacements	64	0	10	$ 2,475.00	$ 158,400.00	$ 15,840.00
STEP Effluent Filter Replacements	96	0	10	$ 70.00	$ 6,720.00	$ 672.00
Treatment System Pumps	1	0	20	$ 62,500.00	$ 62,500.00	(>15 years)
Electrical	1	0	15	$ 154,000.00	$ 154,000.00	$ 10,266.67
Isolation Valves	7	0	20	$ 750.00	$ 5,250.00	(>15 years)
Service Line Valves	64	0	20	$ 270.00	$ 17,280.00	(>15 years)
Air Release Valves	6	0	20	$ 2,900.00	$ 17,400.00	(>15 years)
Piping	1	0	40	$ 432,208.00	$ 432,208.00	(>15 years)
					Total Annual SLA:	**$ 26,778.67**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
STEP Pump Replacements	64	0	10	$ 2,475.00	$ 158,400.00	$ -
STEP Effluent Filter Replacements	96	0	10	$ 70.00	$ 6,720.00	$ -
Treatment System Pumps	1	0	20	$ 73,700.00	$ 73,700.00	$ -
Electrical	1	0	15	$ 154,000.00	$ 154,000.00	$ 103,180.00
Isolation Valves	7	0	20	$ 750.00	$ 5,250.00	$ -
Service Line Valves	64	0	20	$ 270.00	$ 17,280.00	$ -
Air Release Valves	6	0	20	$ 2,900.00	$ 17,400.00	$ -
Piping	1	0	40	$ 432,208.00	$ 432,208.00	$ 216,104.00
					Total Salvage Value:	**$ 319,284.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
CY - Cubic Yard
SY - Square Yard

Tippecanoe
Americus Grinder Alternative

Cost Estimate - Americus Collection System Alternative - Grinder Pump System				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 8,000	$ 8,000
Mobilization/Demobilization (3%)	LS	1	$ 90,300	$ 90,300
Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	14,880	$ 20	$ 297,600
3" Low Pressure Sewer - PVC	LF	19,200	$ 24	$ 460,800
Grinder Pump Assembly - Simplex	EA	142	$ 4,000	$ 568,000
Abandon Existing Septic Tank	EA	142	$ 420	$ 59,700
Pressure Cleanouts	EA	14	$ 750	$ 10,500
Isolation Valves	EA	14	$ 750	$ 10,500
Service Line Valves	EA	142	$ 270	$ 38,400
Air Release Valves	EA	12	$ 2,900	$ 34,800
Electrical, Instrumentation and Contols	LS	1	$ 142,000	$ 142,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Storage Tank	EA	1	$ 45,000	$ 45,000
Seed & Mulching	SY	34,080	$ 1	$ 34,100
Treatment Costs				
Tankage - Concrete Slab	CY	126	$ 450	$ 56,700
Tankage - Concrete Walls	CY	135	$ 650	$ 87,800
Excavation for Tank	CY	252	$ 15	$ 3,800
Remove Surplus Dirt	CY	252	$ 8	$ 2,100
Package Plant	LS	1	$ 943,460	$ 943,500
Building for Blowers, Elec., I&C, lab	LS	1	$ 40,000	$ 40,000
Site Piping	LS	1	$ 18,100	$ 18,100
12" Outfall Piping	LF	600	$ 55	$ 33,000
Electrical, Instrumentation and Contols	LS	1	$ 90,400	$ 90,400
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	1,700	$ 1	$ 1,700
Construction Subtotal				**$ 3,108,300**
Contingency (20%)				**$ 621,700**
Construction Total				**$ 3,730,000**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 447,600	$ 447,600
Resident Project Representation	LS	1	$ 223,800	$ 223,800
Local Council	LS	1	$ 37,300	$ 37,300
Bond Council	LS	1	$ 55,950	$ 56,000
Land Acquisition	LS	1	$ 9,000	$ 9,000
Financial	LS	1	$ 37,300	$ 37,300
Non-Construction Total				**$ 811,000**
Alternative Total Cost				**$ 4,541,000**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Collection System Power	1	LS	$ 5,112.00	$ 5,112.00
Sample Collection Testing	1	LS	$ 23,000.00	$ 23,000.00
Treatment Power	1	LS	$ 1,000.00	$ 1,000.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 44,200.00	$ 44,200.00
				$ -
			Total Annual O&M:	**$ 73,400**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Grinder Pump Replacements	142	0	10	$ 4,000.00	$ 568,000.00	$ 56,800.00
Treatment System Pumps	1	0	20	$ 18,000.00	$ 18,000.00	(>15 years)
Electrical	1	0	15	$ 232,400.00	$ 232,400.00	$ 15,493.33
Isolation Valves	14	0	20	$ 750.00	$ 10,500.00	(>15 years)
Service Line Valves	142	0	20	$ 270.00	$ 38,340.00	(>15 years)
Air Release Valves	12	0	20	$ 2,900.00	$ 34,800.00	(>15 years)
Storage Tank	1	0	40	$ 144,500.00	$ 144,500.00	(>15 years)
Piping	1	0	40	$ 809,500.00	$ 809,500.00	(>15 years)
					Total Annual SLA:	**$ 72,293.33**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Grinder Pump Replacements	142	0	10	$ 4,000.00	$ 568,000.00	$ -
Treatment System Pumps	1	0	20	$ 18,000.00	$ 18,000.00	$ -
Electrical	1	0	15	$ 232,400.00	$ 232,400.00	$ 155,708.00
Isolation Valves	14	0	20	$ 750.00	$ 10,500.00	$ -
Service Line Valves	142	0	20	$ 270.00	$ 38,340.00	$ -
Air Release Valves	12	0	20	$ 2,900.00	$ 34,800.00	$ -
Storage Tank	1	0	40	$ 2,900.00	$ 2,900.00	$ 1,450.00
Piping	1	0	40	$ 809,500.00	$ 809,500.00	$ 404,750.00
					Total Salvage Value:	**$ 561,908.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
CY - Cubic Yard
SY - Square Yard

Tippecanoe
Americus STEP Alternative

Cost Estimate - Americus Collection System Alternative - STEP System				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 8,000	$ 8,000
Mobilization/Demobilization (3%)	LS	1	$ 91,365	$ 91,365
Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	14,880	$ 20	$ 297,600
3" Low Pressure Sewer - PVC	LF	19,200	$ 24	$ 460,800
Septic Tanks (1,200 gal. with Simplex)	EA	142	$ 4,950	$ 702,900
Abandon Existing Septic Tank	EA	142	$ 420	$ 59,700
Pressure Cleanouts	EA	14	$ 750	$ 10,500
Isolation Valves	EA	14	$ 750	$ 10,500
Service Line Valves	EA	142	$ 270	$ 38,400
Air Release Valves	EA	12	$ 2,900	$ 34,800
Electrical, Instrumentation and Contols	LS	1	$ 142,000	$ 142,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	34,080	$ 1	$ 34,100
Treatment Costs				
Excavation and Backfill	CY	4,400	$ 25	$ 110,000
Liner	SF	22,100	$ 2	$ 44,200
Cell Media	CY	2,500	$ 30	$ 75,000
Recirculating Pump Station	EA	1	$ 35,000	$ 35,000
Sand Filter Manifolds	LF	500	$ 5	$ 2,500
Sand Filter Distribution Laterals	LF	16,400	$ 3	$ 49,200
Force Main	LF	400	$ 42	$ 16,800
Drip Irrigation Dosing Pump Station	EA	4	$ 20,000	$ 80,000
Valve Boxes	EA	4	$ 1,600	$ 6,400
Fittings & Cleanouts	LS	1	$ 500	$ 500
Flow Meters	EA	4	$ 1,500	$ 6,000
Drip Irrigation Distribution Laterals	LF	193,000	$ 3	$ 579,000
Drip Irrigation Manifolds	LF	2,000	$ 15	$ 30,000
Supply & Return Piping	LF	5,000	$ 15	$ 75,000
Electrical, Instrumentation and Contols	LS	1	$ 103,100	$ 103,100
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seeding & Mulching	SY	5,000	$ 2	$ 10,000
Construction Subtotal				**$ 3,144,900**
Contingency (20%)				**$ 629,000**
Construction Total				**$ 3,773,900**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 452,900	$ 452,900
Resident Project Representation	LS	1	$ 226,500	$ 226,500
Local Council	LS	1	$ 37,739	$ 37,800
Bond Council	LS	1	$ 56,609	$ 56,700
Land Acquisition	LS	7	$ 9,000	$ 62,000
Financial	LS	1	$ 37,739	$ 37,800
Non-Construction Total				**$ 873,700**
Alternative Total Cost				**$ 4,647,600**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Collection System Power	1	LS	$ 5,112.00	$ 5,112.00
Sample Collection Testing	1	LS	$ 18,000.00	$ 18,000.00
Pump Tanks	1	LS	$ 2,750.00	$ 2,750.00
Treatment Power	1	LS	$ 800.00	$ 180.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 38,200.00	$ 38,200.00
				$ -
			Total Annual O&M:	**$ 64,300**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
STEP Pump Replacements	142	0	10	$ 2,475.00	$ 351,450.00	$ 35,145.00
STEP Effluent Filter Replacements	213	0	20	$ 70.00	$ 14,910.00	$ 745.50
Treatment System Pumps	1	0	20	$ 80,000.00	$ 80,000.00	(>15 years)
Electrical	1	0	15	$ 245,100.00	$ 245,100.00	$ 16,340.00
Isolation Valves	14	0	20	$ 750.00	$ 10,500.00	(>15 years)
Service Line Valves	142	0	20	$ 270.00	$ 38,340.00	(>15 years)
Air Release Valves	12	0	20	$ 2,900.00	$ 34,800.00	(>15 years)
Piping	1	0	40	$ 826,900.00	$ 826,900.00	(>15 years)
					Total Annual SLA:	**$ 52,230.50**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
STEP Pump Replacements	142	0	10	$ 2,475.00	$ 351,450.00	$ -
STEP Effluent Filter Replacements	213	0	10	$ 70.00	$ 14,910.00	$ -
Treatment System Pumps	1	0	20	$ 80,000.00	$ 80,000.00	$ -
Electrical	1	0	15	$ 245,100.00	$ 245,100.00	$ 164,217.00
Isolation Valves	14	0	20	$ 750.00	$ 10,500.00	$ -
Service Line Valves	142	0	20	$ 270.00	$ 38,340.00	$ -
Air Release Valves	12	0	20	$ 2,900.00	$ 34,800.00	$ -
Piping	1	0	40	$ 826,900.00	$ 826,900.00	$ 413,450.00
					Total Salvage Value:	**$ 577,667.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
CY - Cubic Yard
SY - Square Yard

Tippecanoe
Colburn Grinder Alternative

Cost Estimate - Colburn Collection System Alternative - Grinder Pump System				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 8,000	$ 8,000
Mobilization/Demobilization (3%)	LS	1	$ 52,164	$ 52,164
Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	5,490	$ 20	$ 109,800
3" Low Pressure Sewer - PVC	LF	8,535	$ 24	$ 204,900
Grinder Pump Assembly - Simplex	EA	65	$ 4,000	$ 260,000
Abandon Existing Septic Tank	EA	65	$ 420	$ 27,300
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	65	$ 270	$ 17,600
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 65,000	$ 65,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Storage Tank	EA	1	$ 45,000	$ 45,000
Seed & Mulching	SY	14025	$ 1	$ 14,100
Treatment Costs				
Tankage - Concrete Slab	CY	66	$ 450	$ 29,700
Tankage - Concrete Walls	CY	74	$ 650	$ 48,100
Excavation for Tank	CY	132	$ 15	$ 2,000
Remove Surplus Dirt	CY	132	$ 8	$ 1,100
Package Plant	LS	1	$ 686,850	$ 686,900
Building for Blowers, Elec., I&C, lab	LS	1	$ 40,000	$ 40,000
Site Piping	LS	1	$ 16,500	$ 16,500
12" Outfall Piping	LF	90	$ 55	$ 5,000
Electrical, Instrumentation and Contols	LS	1	$ 82,500	$ 82,500
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	1,300	$ 1	$ 1,300
Construction Subtotal				**$ 1,799,000**
Contingency (20%)				**$ 359,800**
Construction Total				**$ 2,158,800**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 259,100	$ 259,100
Resident Project Representation	LS	1	$ 129,600	$ 129,600
Local Council	LS	1	$ 21,588	$ 21,600
Bond Council	LS	1	$ 32,382	$ 32,400
Land Acquisition	LS	1	$ 9,000	$ 9,000
Financial	LS	1	$ 21,588	$ 21,600
Non-Construction Total				**$ 473,300**
Alternative Total Cost				**$ 2,632,100**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Collection System Power	1	LS	$ 2,340.00	$ 2,340.00
Sample Collection Testing	1	LS	$ 23,000.00	$ 23,000.00
Treatment Power	1	LS	$ 1,000.00	$ 180.00
Labor for Inspection, Maintenance, & Samp	1	LS	$ 36,500.00	$ 36,500.00
				$ -
			Total Annual O&M:	**$ 62,100**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Grinder Pump Replacements	65	0	10	$ 4,000.00	$ 260,000.00	$ 26,000.00
Treatment System Pumps	1	0	20	$ 15,000.00	$ 15,000.00	(>15 years)
Electrical	1	0	15	$ 147,500.00	$ 147,500.00	$ 9,833.33
Isolation Valves	65	0	20	$ 750.00	$ 48,750.00	(>15 years)
Service Line Valves	6	0	20	$ 270.00	$ 1,620.00	(>15 years)
Air Release Valves	75	0	20	$ 2,900.00	$ 217,500.00	(>15 years)
Storage Tank	1	0	40	$ 77,800.00	$ 77,800.00	(>15 years)
Piping	1	0	40	$ 336,200.00	$ 336,200.00	(>15 years)
					Total Annual SLA:	**$ 35,833.33**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Grinder Pump Replacements	65	0	10	$ 4,000.00	$ 260,000.00	$ -
Treatment System Pumps	1	0	20	$ 15,000.00	$ 15,000.00	$ -
Electrical	1	0	15	$ 147,500.00	$ 147,500.00	$ 98,825.00
Isolation Valves	65	0	20	$ 750.00	$ 48,750.00	$ -
Service Line Valves	6	0	20	$ 270.00	$ 1,620.00	$ -
Air Release Valves	75	0	20	$ 2,900.00	$ 217,500.00	$ -
Storage Tank	1	0	40	$ 77,800.00	$ 77,800.00	$ 38,900.00
Piping	1	0	40	$ 336,200.00	$ 336,200.00	$ 168,100.00
					Total Salvage Value:	**$ 305,825.00**

Key

EA - Each
LS - Lump Sum
LF - Lineal Feet
CY - Cubic Yard
SY - Square Yard

Tippecanoe
Colburn STEP Alternative

Cost Estimate - Colburn Collection System Alternative - STEP System				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 8,000	$ 8,000
Mobilization/Demobilization (3%)	LS	1	$ 58,152	$ 58,152
Construction Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	5,490	$ 20	$ 109,800
3" Low Pressure Sewer - PVC	LF	8,535	$ 24	$ 204,900
Septic Tanks (1,200 gal. with Simplex)	EA	65	$ 4,950	$ 321,800
Abandon Existing Septic Tank	EA	65	$ 420	$ 27,300
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	65	$ 270	$ 17,600
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 65,000	$ 65,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	14,025	$ 1	$ 14,100
Treatment Costs				
Excavation and Backfill	CY	3,344	$ 25	$ 83,600
Liner	SF	16,796	$ 2	$ 33,592
Cell Media	CY	1,900	$ 30	$ 57,000
Recirculating Pump Station	EA	1	$ 30,000	$ 30,000
Sand Filter Manifolds	LF	380	$ 5	$ 1,900
Sand Filter Distribution Laterals	LF	12,464	$ 3	$ 37,392
Force Main	LF	304	$ 42	$ 12,768
Electrical, Instrumentation and Contols	LS	1	$ 80,000	$ 80,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	12,684	$ 2	$ 25,368
Disposal Costs (Sand Mounds)				
Dosing System	LS	1	$ 32,500	$ 32,500
Distribution Structure	EA	4	$ 3,500	$ 14,000
4" Force Main	LF	6,120	$ 42	$ 257,040
3" Manifold	LF	170	$ 26	$ 4,420
1 1/2" Piping	LF	5,150	$ 8	$ 41,200
Prepare Plowed Layer	SY	14,500	$ 3	$ 43,500
Aggregate Bed	CY	1,945	$ 35	$ 68,075
Sand	CY	3,384	$ 35	$ 118,440
Topsoil	CY	2,114	$ 30	$ 63,420
Electrical, Instrumentation and Contols	LS	1	$ 69,000	$ 69,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	12,684	$ 1	$ 12,684
Construction Subtotal				**$ 2,004,600**
Contingency (20%)				**$ 401,000**
Construction Total				**$ 2,405,600**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 288,700	$ 288,700
Resident Project Representation	LS	1	$ 144,400	$ 144,400
Local Council	LS	1	$ 24,056	$ 24,100
Bond Council	LS	1	$ 36,084	$ 36,100
Land Acquisition	LS	4	$ 9,000	$ 33,500
Financial	LS	1	$ 24,056	$ 24,100
Non-Construction Total				**$ 550,900**
Alternative Total Cost				**$ 2,956,500**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Collection System Power	1	LS	$ 2,340.00	$ 2,340.00
Sample Collection Testing	1	LS	$ 18,000.00	$ 18,000.00
Pump Tanks	1	LS	$ 4,116.67	$ 4,116.67
Treatment Power	1	LS	$ 800.00	$ 180.00
Labor for Inspection, Maintenance, & Sam	1	LS	$ 30,500.00	$ 30,500.00
				$ -
			Total Annual O&M:	**$ 55,200**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
STEP Pump Replacements	65	0	10	$ 2,475.00	$ 160,875.00	$ 16,087.50
STEP Effluent Filter Replacements	98	0	10	$ 70.00	$ 6,825.00	$ 682.50
Treatment System Pumps	1	0	20	$ 62,500.00	$ 62,500.00	(>15 years)
Electrical	1	0	15	$ 214,000.00	$ 214,000.00	$ 14,266.67
Isolation Valves	7	0	20	$ 750.00	$ 5,250.00	(>15 years)
Service Line Valves	65	0	20	$ 270.00	$ 17,550.00	(>15 years)
Air Release Valves	6	0	20	$ 2,900.00	$ 17,400.00	(>15 years)
Piping	1	0	40	$ 353,992.00	$ 353,992.00	(>15 years)
Total Annual SLA:						**$ 31,036.67**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
STEP Pump Replacements	65	0	10	$ 2,475.00	$ 160,875.00	$ -
STEP Effluent Filter Replacements	98	0	10	$ 70.00	$ 6,825.00	$ -
Treatment System Pumps	1	0	20	$ 73,700.00	$ 73,700.00	$ -
Electrical	1	0	15	$ 214,000.00	$ 214,000.00	$ 143,380.00
Isolation Valves	7	0	20	$ 750.00	$ 5,250.00	$ -
Service Line Valves	65	0	20	$ 270.00	$ 17,550.00	$ -
Air Release Valves	6	0	20	$ 2,900.00	$ 17,400.00	$ -
Piping	1	0	40	$ 353,992.00	$ 353,992.00	$ 176,996.00
Total Salvage Value:						**$ 320,376.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
CY - Cubic Yard
SY - Square Yard

Tippecanoe
Centralized Alt. - STEP to RMF

Cost Estimate - Collection System Alternative - STEP to RMF				
Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Mobilization/Demobilization (3%)	LS	1	$ 209,434	$ 209,434
Construction Layout	LS	1	$ 24,000	$ 24,000
Buck Creek Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	8,045	$ 20	$ 160,900
3" Low Pressure Sewer - PVC	LF	9,075	$ 24	$ 217,800
Septic Tanks (1,200 gal. with Simplex)	EA	64	$ 4,950	$ 316,800
Abandon Existing Septic Tank	EA	64	$ 420	$ 26,900
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	64	$ 270	$ 17,300
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 64,000	$ 64,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	17,120	$ 1	$ 17,200
Americus Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	14,880	$ 20	$ 297,600
3" Low Pressure Sewer - PVC	LF	19,200	$ 24	$ 460,800
Septic Tanks (1,200 gal. with Simplex)	EA	142	$ 4,950	$ 702,900
Abandon Existing Septic Tank	EA	142	$ 420	$ 59,700
Pressure Cleanouts	EA	14	$ 750	$ 10,500
Isolation Valves	EA	14	$ 750	$ 10,500
Service Line Valves	EA	142	$ 270	$ 38,400
Air Release Valves	EA	12	$ 2,900	$ 34,800
Electrical, Instrumentation and Contols	LS	1	$ 142,000	$ 142,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	34,080	$ 1	$ 34,100
Colburn Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	5,490	$ 20	$ 109,800
3" Low Pressure Sewer - PVC	LF	8,535	$ 24	$ 204,900
Septic Tanks (1,200 gal. with Simplex)	EA	65	$ 4,950	$ 321,800
Abandon Existing Septic Tank	EA	65	$ 420	$ 27,300
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	65	$ 270	$ 17,600
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 65,000	$ 65,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	14,025	$ 1	$ 14,100
Transport System Costs				
Maintenance of Traffic	LS	1	$ 20,000	$ 20,000
4" Forcemain from Buck Creek	LF	11,400	$ 32	$ 364,800
4" Forcemain from Colburn	LF	11,620	$ 32	$ 371,900
4" Combined Forcemain to Americus	LF	4,730	$ 32	$ 151,400
Intermediate Pump Station (55 gpm)	EA	2	$ 50,000	$ 100,000
Bore Under Hwy 25 (from Buck Creek)	LF	275	$ 250	$ 68,800
Bore Under Hwy 25 (from Colburn)	LF	275	$ 250	$ 68,800
Valves	EA	15	$ 2,000	$ 30,000
Fittings	EA	15	$ 5,000	$ 75,000
Seed & Mulching	SY	27,750	$ 1	$ 27,800
Treatment Costs				
Excavation and Backfill	CYD	10,428	$ 25	$ 260,700
Liner	SF	52,377	$ 1.5	$ 78,566
Cell Media	CY	5,925	$ 30	$ 177,750
Recirculating Pump Station	EA	1	$ 30,000	$ 30,000
Sand Filter Manifolds	LF	1,185	$ 3	$ 3,555
Sand Filter Distribution Laterals	LF	38,868	$ 2	$ 58,302
Force Main	LF	948	$ 42	$ 39,816
Drip Irrigation Dosing Pump Station	EA	10	$ 20,000	$ 200,000
Valve Boxes	EA	10	$ 1,600	$ 16,000
Fittings & Cleanouts	LS	1	$ 500	$ 500
Flow Meters	EA	10	$ 1,500	$ 15,000
Drip Irrigation Distribution Laterals	LF	457,410	$ 2	$ 914,820
Drip Irrigation Manifolds	LF	4,740	$ 6	$ 28,440
Supply & Return Piping	LF	11,850	$ 6	$ 71,100
Electrical, Instrumentation and Contols	LS	1	$ 238,100	$ 238,100
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seeding & Mulching	SY	11,850	$ 1.5	$ 17,775
Construction Subtotal				**$ 7,214,600**
Contingency (20%)				**$ 1,443,000**
Construction Total				**$ 8,657,600**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 1,039,000	$ 1,039,000
Resident Project Representation	LS	1	$ 519,500	$ 519,500
Local Council	LS	1	$ 86,576	$ 86,600
Bond Council	LS	1	$ 129,864	$ 129,900
Land Acquisition	LS	15	$ 9,000	$ 136,600
Financial	LS	1	$ 86,576	$ 86,600
Non-Construction Total				**$ 1,998,200**
Alternative Total Cost				**$ 10,655,800**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Collection System Power	1	LS	$ 9,756.00	$ 9,756.00
Sample Collection Testing	1	LS	$ 18,000.00	$ 18,000.00
Pump Tanks	1	LS	$ 5,625.00	$ 5,625.00
Treatment Power	1	LS	$ 1,000.00	$ 1,000.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 87,100.00	$ 87,100.00
				$ -
			Total Annual O&M:	**$ 121,500**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
STEP Pump Replacements	271	0	10	$ 2,475.00	$ 670,725.00	$ 67,072.50
STEP Effluent Filter Replacements	407	0	10	$ 70.00	$ 28,455.00	$ 2,845.50
Treatment System Pumps	1	0	20	$ 230,000.00	$ 230,000.00	(>15 years)
Electrical	1	0	15	$ 509,100.00	$ 509,100.00	$ 33,940.00
Isolation Valves	28	0	20	$ 750.00	$ 21,000.00	(>15 years)
Service Line Valves	271	0	20	$ 270.00	$ 73,170.00	(>15 years)
Air Release Valves	24	0	20	$ 2,900.00	$ 69,600.00	(>15 years)
Storage Tank	1	0	40	$ -	$ -	(>15 years)
Piping	1	0	40	$ 2,441,573.00	$ 2,441,573.00	(>15 years)
					Total Annual SLA:	**$ 103,858.00**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Grinder Pump Replacements	271	0	10	$ 2,475.00	$ 670,725.00	$ -
STEP Effluent Filter Replacements	407	0	10	$ 70.00	$ 28,455.00	$ 2,845.50
Treatment System Pumps	1	0	20	$ 230,000.00	$ 230,000.00	$ -
Electrical	1	0	15	$ 509,100.00	$ 509,100.00	$ 341,097.00
Isolation Valves	28	0	20	$ 750.00	$ 21,000.00	$ -
Service Line Valves	271	0	20	$ 270.00	$ 73,170.00	$ -
Air Release Valves	24	0	20	$ 2,900.00	$ 69,600.00	$ -
Storage Tank	1	0	40	$ 20,000.00	$ 20,000.00	$ 10,000.00
Piping	1	0	40	$ 2,441,573.00	$ 2,441,573.00	$ 1,220,786.50
					Total Salvage Value:	**$ 1,574,729.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
CY - Cubic Yard
SY - Square Yard

Tippecanoe
Centralized Alt. - Package Plant

Cost Estimate - Collection System Alternative - Grinders to Package Plant				
Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Mobilization/Demobilization (3%)	LS	1	$ 178,338	$ 178,338
Construction Layout	LS	1	$ 24,000	$ 24,000
Buck Creek Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	8,045	$ 20	$ 160,900
3" Low Pressure Sewer - PVC	LF	9,075	$ 24	$ 217,800
Grinder Pump Assembly - Simplex	EA	64	$ 4,000	$ 256,000
Abandon Existing Septic Tank	EA	64	$ 420	$ 26,900
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	64	$ 270	$ 17,300
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 64,000	$ 64,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	17120	$ 1	$ 17,200
Americus Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	14,880	$ 20	$ 297,600
3" Low Pressure Sewer - PVC	LF	19,200	$ 24	$ 460,800
Grinder Pump Assembly - Simplex	EA	142	$ 4,000	$ 568,000
Abandon Existing Septic Tank	EA	142	$ 420	$ 59,700
Pressure Cleanouts	EA	14	$ 750	$ 10,500
Isolation Valves	EA	14	$ 750	$ 10,500
Service Line Valves	EA	142	$ 270	$ 38,400
Air Release Valves	EA	12	$ 2,900	$ 34,800
Electrical, Instrumentation and Contols	LS	1	$ 142,000	$ 142,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	34,080	$ 1	$ 34,100
Colburn Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	5,490	$ 20	$ 109,800
3" Low Pressure Sewer - PVC	LF	8,535	$ 24	$ 204,900
Grinder Pump Assembly - Simplex	EA	65	$ 4,000	$ 260,000
Abandon Existing Septic Tank	EA	65	$ 420	$ 27,300
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	65	$ 270	$ 17,600
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 65,000	$ 65,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	14025	$ 1	$ 14,100
Transport System Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
4" Forcemain from Buck Creek	LF	11,400	$ 32	$ 364,800
4" Forcemain from Colburn	LF	11,620	$ 32	$ 371,900
4" Combined Forcemain to Americus	LF	4,730	$ 32	$ 151,400
Intermediate Pump Station (55 gpm)	EA	2	$ 50,000	$ 100,000
Bore Under Hwy 25 (from Buck Creek)	LF	275	$ 250	$ 68,800
Bore Under Hwy 25 (from Colburn)	LF	275	$ 250	$ 68,800
Valves	EA	15	$ 2,000	$ 30,000
Fittings	EA	15	$ 5,000	$ 75,000
Seed & Mulching	SY	27,750	$ 1	$ 27,800
Treatment Costs				
Tankage - Concrete Slab	CY	203	$ 450	$ 91,400
Tankage - Concrete Walls	CY	177	$ 650	$ 115,100
Excavation for Tank	CY	406	$ 15	$ 6,100
Remove Surplus Dirt	CY	406	$ 8	$ 3,300
Package Plant	LS	1	$ 928,680	$ 928,700
Building for Blowers, Elec., I&C, lab	LS	1	$ 60,000	$ 60,000
Site Piping	LS	1	$ 24,300	$ 24,300
12" Outfall Piping	LF	600	$ 55	$ 33,000
Electrical, Instrumentation and Contols	LS	1	$ 122,000	$ 122,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	4,000	$ 1	$ 4,000
Construction Subtotal				**$ 6,147,000**
Contingency (20%)				**$ 1,229,400**
Construction Total				**$ 7,376,400**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 885,200	$ 885,200
Resident Project Representation	LS	1	$ 442,600	$ 442,600
Local Council	LS	1	$ 73,764	$ 73,800
Bond Council	LS	1	$ 110,646	$ 110,700
Land Acquisition	LS	1	$ 9,000	$ 9,000
Financial	LS	1	$ 73,764	$ 73,800
Non-Construction Total				**$ 1,595,100**
Alternative Total Cost				**$ 8,971,500**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Collection System Power	1	LS	$ 9,756.00	$ 9,756.00
Sample Collection Testing	1	LS	$ 23,000.00	$ 23,000.00
Treatment Power	1	LS	$ 1,500.00	$ 1,500.00
Labor for Inspection, Maintenance, & Sampling	1	LS	$ 99,100.00	$ 99,100.00
				$ -
			Total Annual O&M:	**$ 133,400**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Grinder Pump Replacements	271	0	10	$ 4,000.00	$ 1,084,000.00	$ 108,400.00
Treatment System Pumps	1	0	20	$ 30,000.00	$ 30,000.00	(>15 years)
Electrical	1	0	15	$ 393,000.00	$ 393,000.00	$ 26,200.00
Isolation Valves	28	0	20	$ 750.00	$ 21,000.00	(>15 years)
Service Line Valves	271	0	20	$ 270.00	$ 73,170.00	(>15 years)
Air Release Valves	24	0	20	$ 2,900.00	$ 69,600.00	(>15 years)
Storage Tank	1	0	40	$ 206,500.00	$ 206,500.00	(>15 years)
Piping	1	0	40	$ 2,074,000.00	$ 2,074,000.00	(>15 years)
					Total Annual SLA:	**$ 134,600.00**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Grinder Pump Replacements	271	0	10	$ 4,000.00	$ 1,084,000.00	$ -
Treatment System Pumps	1	0	20	$ 30,000.00	$ 30,000.00	$ -
Electrical	1	0	15	$ 393,000.00	$ 393,000.00	$ 263,310.00
Isolation Valves	28	0	20	$ 750.00	$ 21,000.00	$ -
Service Line Valves	271	0	20	$ 270.00	$ 73,170.00	$ -
Air Release Valves	24	0	20	$ 2,900.00	$ 69,600.00	$ -
Storage Tank	1	0	40	$ 206,500.00	$ 206,500.00	$ 103,250.00
Piping	1	0	40	$ 2,074,000.00	$ 2,074,000.00	$ 1,037,000.00
					Total Salvage Value:	**$ 1,403,560.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
CY - Cubic Yard
SY - Square Yard

Tippecanoe
Regionalized Alt. - STEP System to Lafayette

Cost Estimate - Collection System Alternative - STEP to Lafayette				
Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Mobilization/Demobilization (3%)	LS	1	$ 247,236	$ 247,236
Construction Layout	LS	1	$ 24,000	$ 24,000
Buck Creek Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	8,045	$ 20	$ 160,900
3" Low Pressure Sewer - PVC	LF	9,075	$ 24	$ 217,800
Septic Tanks (1,200 gal. with Simplex)	EA	64	$ 4,950	$ 316,800
Abandon Existing Septic Tank	EA	64	$ 420	$ 26,900
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	64	$ 270	$ 17,300
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 64,000	$ 64,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	17,120	$ 1	$ 17,200
Americus Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	14,880	$ 20	$ 297,600
3" Low Pressure Sewer - PVC	LF	19,200	$ 24	$ 460,800
Septic Tanks (1,200 gal. with Simplex)	EA	142	$ 4,950	$ 702,900
Abandon Existing Septic Tank	EA	142	$ 420	$ 59,700
Pressure Cleanouts	EA	14	$ 750	$ 10,500
Isolation Valves	EA	14	$ 750	$ 10,500
Service Line Valves	EA	142	$ 270	$ 38,400
Air Release Valves	EA	12	$ 2,900	$ 34,800
Electrical, Instrumentation and Contols	LS	1	$ 64,000	$ 64,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	34,080	$ 1	$ 34,100
Colburn Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	5,490	$ 20	$ 109,800
3" Low Pressure Sewer - PVC	LF	8,535	$ 24	$ 204,900
Septic Tanks (1,200 gal. with Simplex)	EA	65	$ 4,950	$ 321,800
Abandon Existing Septic Tank	EA	65	$ 420	$ 27,300
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	65	$ 270	$ 17,600
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 65,000	$ 65,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	14,025	$ 1	$ 14,100
Transport Costs				
Maintenance of Traffic	LS	1	$ 25,000	$ 25,000
4" Forcemain from Colburn	LF	11,620	$ 32	$ 371,900
4" Forcemain from Americus	LF	4,730	$ 32	$ 151,400
4" Forcemain from Buck Creek	LF	670	$ 32	$ 21,500
6" Combined Forcemain to Buck Creek	LF	10,730	$ 50	$ 536,500
6" Forcemain to Lafayette	LF	53,715	$ 50	$ 2,685,750
Valves	EA	50	$ 2,500	$ 125,000
Fittings	EA	50	$ 7,500	$ 375,000
Buck Creek Lift Station (to send to Lafayette)	EA	1	$ 250,000	$ 250,000
Chemical Feed System (prevents septicity)	LS	1	$ 120,000	$ 120,000
Electrical, Instrumentation and Contols	LS	1	$ 37,500	$ 37,500
Seeding & Mulching	SY	81,465	$ 1	$ 81,465
Construction Subtotal				**$ 8,512,500**
Contingency (20%)				**$ 1,702,500**
Construction Total				**$ 10,215,000**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 1,225,800	$ 1,225,800
Resident Project Representation	LS	1	$ 612,900	$ 612,900
Local Council	LS	1	$ 102,150	$ 102,200
Bond Council	LS	1	$ 153,225	$ 153,300
Land Acquisition	LS	0	$ 9,000	$ -
Financial	LS	1	$ 102,150	$ 102,200
Non-Construction Total				**$ 2,196,400**
Alternative Total Cost				**$ 12,411,400**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Estimated Annual Sewer Connection Costs	1	LS	$ 198,560.00	$ 198,560.00
Collection System Power	1	LS	$ 9,756.00	$ 9,756.00
Pump Tanks	1	LS	$ 17,163.33	$ 17,163.33
Labor for Inspection & Maintenance	1	LS	$ 54,200.00	$ 54,200.00
				$ -
Total Annual O&M:				**$ 279,700**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
STEP Pump Replacements	271	0	10	$ 2,475.00	$ 670,725.00	$ 67,072.50
STEP Effluent Filter Replacements	407	0	10	$ 70.00	$ 28,455.00	$ 2,845.50
Lift Station Pumps	1	0	20		$ -	(>15 years)
Electrical	1	0	15	$ 443,000.00	$ 443,000.00	$ 29,533.33
Isolation Valves	28	0	20	$ 750.00	$ 21,000.00	(>15 years)
Service Line Valves	271	0	20	$ 270.00	$ 73,170.00	(>15 years)
Air Release Valves	24	0	20	$ 2,900.00	$ 69,600.00	(>15 years)
Piping	1	0	40	$ 5,218,850.00	$ 5,218,850.00	(>15 years)
Total Annual SLA:						**$ 99,451.33**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
STEP Pump Replacements	271	0	10	$ 2,475.00	$ 670,725.00	$ -
STEP Effluent Filter Replacements	407	0	10	$ 70.00	$ 28,455.00	$ -
Lift Station Pumps	1	0	20	$ -	$ -	$ -
Electrical	1	0	15	$ 443,000.00	$ 443,000.00	$ 296,810.00
Isolation Valves	28	0	20	$ 750.00	$ 21,000.00	$ -
Service Line Valves	271	0	20	$ 270.00	$ 73,170.00	$ -
Air Release Valves	24	0	20	$ 2,900.00	$ 69,600.00	$ -
Piping	1	0	40	$ 5,218,850.00	$ 5,218,850.00	$ 2,609,425.00
Total Salvage Value:						**$ 2,906,235.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
SY - Square Yard

Tippecanoe
Regionalized Alt. - STEP System to Delphi

Cost Estimate - Collection System Alternative - STEP to Delphi				
Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Mobilization/Demobilization (3%)	LS	1	$ 199,463	$ 199,463
Construction Layout	LS	1	$ 24,000	$ 24,000
Buck Creek Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	8,045	$ 20	$ 160,900
3" Low Pressure Sewer - PVC	LF	9,075	$ 24	$ 217,800
Septic Tanks (1,200 gal. with Simplex)	EA	64	$ 4,950	$ 316,800
Abandon Existing Septic Tank	EA	64	$ 420	$ 26,900
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	64	$ 270	$ 17,300
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 34,000	$ 34,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	17,120	$ 1	$ 17,200
Americus Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	14,880	$ 20	$ 297,600
3" Low Pressure Sewer - PVC	LF	19,200	$ 24	$ 460,800
Septic Tanks (1,200 gal. with Simplex)	EA	142	$ 4,950	$ 702,900
Abandon Existing Septic Tank	EA	142	$ 420	$ 59,700
Pressure Cleanouts	EA	14	$ 750	$ 10,500
Isolation Valves	EA	14	$ 750	$ 10,500
Service Line Valves	EA	142	$ 270	$ 38,400
Air Release Valves	EA	12	$ 2,900	$ 34,800
Electrical, Instrumentation and Contols	LS	1	$ 64,000	$ 64,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	34,080	$ 1	$ 34,100
Colburn Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	5,490	$ 20	$ 109,800
3" Low Pressure Sewer - PVC	LF	8,535	$ 24	$ 204,900
Septic Tanks (1,200 gal. with Simplex)	EA	65	$ 4,950	$ 321,800
Abandon Existing Septic Tank	EA	65	$ 420	$ 27,300
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	65	$ 270	$ 17,600
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 34,000	$ 34,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	14,025	$ 1	$ 14,100
Transport Costs				
Maintenance of Traffic	LS	1	$ 25,000	$ 25,000
4" Forcemain from Americus	LF	4,730	$ 32	$ 151,400
4" Forcemain from Buck Creek	LF	11,400	$ 32	$ 364,800
4" Forcemain from Colburn	LF	1,555	$ 32	$ 49,760
6" Combined Forcemain to Colburn	LF	11,620	$ 50	$ 581,000
6" Forcemain to Delphi	LF	26,290	$ 50	$ 1,314,500
Valves	EA	30	$ 2,500	$ 75,000
Fittings	EA	30	$ 7,500	$ 225,000
Colburn Lift Station (to send to Delphi)	EA	1	$ 250,000	$ 250,000
Chemical Feed System (prevents septicity)	LS	1	$ 120,000	$ 120,000
Electrical, Instrumentation and Contols	LS	1	$ 37,500	$ 37,500
Seeding & Mulching	SY	55,595	$ 1	$ 55,595
Construction Subtotal				**$ 6,872,300**
Contingency (20%)				**$ 1,374,500**
Construction Total				**$ 8,246,800**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 989,700	$ 989,700
Resident Project Representation	LS	1	$ 494,900	$ 494,900
Local Council	LS	1	$ 82,468	$ 82,500
Bond Council	LS	1	$ 123,702	$ 123,800
Land Acquisition	LS	0	$ 9,000	$ -
Financial	LS	1	$ 82,468	$ 82,500
Non-Construction Total				**$ 1,773,400**
Alternative Total Cost				**$ 10,020,200**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Estimated Annual Sewer Connection Costs	1	LS	$ 125,200.00	$ 125,200.00
Collection System Power	1	LS	$ 9,756.00	$ 9,756.00
Pump Tanks	1	LS	$ 17,163.33	$ 17,163.33
Labor for Inspection & Maintenance	1	LS	$ 54,200.00	$ 54,200.00
				$ -
Total Annual O&M:				**$ 206,400**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
STEP Pump Replacements	271	0	10	$ 2,475.00	$ 670,725.00	$ 67,072.50
STEP Effluent Filter Replacements	407	0	10	$ 70.00	$ 28,455.00	$ 2,845.50
Lift Station Pumps	1	0	20	$ 75,000.00	$ 75,000.00	(>15 years)
Electrical	1	0	15	$ 169,500.00	$ 169,500.00	$ 11,300.00
Isolation Valves	28	0	20	$ 750.00	$ 21,000.00	(>15 years)
Service Line Valves	28	0	20	$ 270.00	$ 7,560.00	(>15 years)
Air Release Valves	24	0	20	$ 2,900.00	$ 69,600.00	(>15 years)
Piping	1	0	40	$ 3,913,260.00	$ 3,913,260.00	(>15 years)
Total Annual SLA:						**$ 81,218.00**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
STEP Pump Replacements	271	0	10	$ 2,475.00	$ 670,725.00	$ -
STEP Effluent Filter Replacements	407	0	10	$ 70.00	$ 28,455.00	$ -
Lift Station Pumps	1	0	20	$ 75,000.00	$ 75,000.00	$ -
Electrical	1	0	15	$ 169,500.00	$ 169,500.00	$ 113,565.00
Isolation Valves	28	0	20	$ 750.00	$ 21,000.00	$ -
Service Line Valves	28	0	20	$ 270.00	$ 7,560.00	$ -
Air Release Valves	24	0	20	$ 2,900.00	$ 69,600.00	$ -
Piping	1	0	40	$ 3,913,260.00	$ 3,913,260.00	$ 1,956,630.00
Total Salvage Value:						**$ 2,070,195.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
SY - Square Yard

Tippecanoe
Regionalized Alt. - Grinder Pumps to Lafayette

Cost Estimate - Collection System Alternative - Grinders to Lafayette				
Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Mobilization/Demobilization (3%)	LS	1	$ 239,511	$ 239,511
Construction Layout	LS	1	$ 24,000	$ 24,000
Buck Creek Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	8,045	$ 20	$ 160,900
3" Low Pressure Sewer - PVC	LF	9,075	$ 24	$ 217,800
Grinder Pump Assembly - Simplex	EA	64	$ 4,000	$ 256,000
Abandon Existing Septic Tank	EA	64	$ 420	$ 26,900
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	64	$ 270	$ 17,300
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 64,000	$ 64,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	17120	$ 1	$ 17,200
Americus Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	14,880	$ 20	$ 297,600
3" Low Pressure Sewer - PVC	LF	19,200	$ 24	$ 460,800
Grinder Pump Assembly - Simplex	EA	142	$ 4,000	$ 568,000
Abandon Existing Septic Tank	EA	142	$ 420	$ 59,700
Pressure Cleanouts	EA	14	$ 750	$ 10,500
Isolation Valves	EA	14	$ 750	$ 10,500
Service Line Valves	EA	142	$ 270	$ 38,400
Air Release Valves	EA	12	$ 2,900	$ 34,800
Electrical, Instrumentation and Contols	LS	1	$ 64,000	$ 64,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	34,080	$ 1	$ 34,100
Colburn Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	5,490	$ 20	$ 109,800
3" Low Pressure Sewer - PVC	LF	8,535	$ 24	$ 204,900
Grinder Pump Assembly - Simplex	EA	65	$ 4,000	$ 260,000
Abandon Existing Septic Tank	EA	65	$ 420	$ 27,300
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	65	$ 270	$ 17,600
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 65,000	$ 65,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	14025	$ 1	$ 14,100
Transport System Costs				
Maintenance of Traffic	LS	1	$ 25,000	$ 25,000
4" Forcemain from Colburn	LF	11,620	$ 32	$ 371,900
4" Forcemain from Americus	LF	4,730	$ 32	$ 151,400
4" Forcemain from Buck Creek	LF	670	$ 32	$ 21,500
6" Combined Forcemain to Buck Creek	LF	10,730	$ 50	$ 536,500
6" Forcemain to Lafayette	LF	53,715	$ 50	$ 2,685,750
Valves	EA	50	$ 2,500	$ 125,000
Fittings	EA	50	$ 7,500	$ 375,000
Buck Creek Lift Station (to send to Lafayette)	EA	1	$ 250,000	$ 250,000
Chemical Feed System (prevents septicity)	LS	1	$ 120,000	$ 120,000
Electrical, Instrumentation and Contols	LS	1	$ 37,500	$ 37,500
Seeding & Mulching	SY	81,465	$ 1	$ 81,465
Construction Subtotal				**$ 8,247,300**
Contingency (20%)				**$ 1,649,500**
Construction Total				**$ 9,896,800**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 1,187,700	$ 1,187,700
Resident Project Representation	LS	1	$ 593,900	$ 593,900
Local Council	LS	1	$ 98,968	$ 99,000
Bond Council	LS	1	$ 148,452	$ 148,500
Land Acquisition	LS	0	$ 9,000	$ -
Financial	LS	1	$ 98,968	$ 99,000
Non-Construction Total				**$ 2,128,100**
Alternative Total Cost				**$ 12,024,900**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Estimated Annual Sewer Connection Costs	1	LS	$ 198,560.00	$ 198,560.00
Collection System Power	1	LS	$ 9,756.00	$ 9,756.00
Labor for Inspection & Maintenance	1	LS	$ 40,650.00	$ 40,650.00
				$ -
			Total Annual O&M:	**$ 249,000**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Grinder Pump Replacements	271	0	10	$ 4,000.00	$ 1,084,000.00	$ 108,400.00
Lift Station Pumps	1	0	20	$ 75,000.00	$ 75,000.00	(>15 years)
Electrical	1	0	15	$ 230,500.00	$ 230,500.00	$ 15,366.67
Isolation Valves	28	0	20	$ 750.00	$ 21,000.00	(>15 years)
Service Line Valves	271	0	20	$ 270.00	$ 73,170.00	(>15 years)
Air Release Valves	24	0	20	$ 2,900.00	$ 69,600.00	(>15 years)
Piping	1	0	40	$ 5,218,850.00	$ 5,218,850.00	(>15 years)
					Total Annual SLA:	**$ 123,766.67**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Grinder Pump Replacements	271	0	10	$ 4,000.00	$ 1,084,000.00	$ -
Treatment System Pumps	1	0	20	$ 75,000.00	$ 75,000.00	$ -
Electrical	1	0	15	$ 230,500.00	$ 230,500.00	$ 154,435.00
Isolation Valves	28	0	20	$ 750.00	$ 21,000.00	$ -
Service Line Valves	271	0	20	$ 270.00	$ 73,170.00	$ -
Air Release Valves	24	0	20	$ 2,900.00	$ 69,600.00	$ -
Piping	1	0	40	$ 5,218,850.00	$ 5,218,850.00	$ 2,609,425.00
					Total Salvage Value:	**$ 2,763,860.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
SY - Square Yard

Tippecanoe
Regionalized Alt. - Grinder Pumps to Delphi

Cost Estimate - Collection System Alternative - Grinders to Delphi				
Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Mobilization/Demobilization (3%)	LS	1	$ 193,568	$ 193,568
Construction Layout	LS	1	$ 24,000	$ 24,000
Buck Creek Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	8,045	$ 20	$ 160,900
3" Low Pressure Sewer - PVC	LF	9,075	$ 24	$ 217,800
Grinder Pump Assembly - Simplex	EA	64	$ 4,000	$ 256,000
Abandon Existing Septic Tank	EA	64	$ 420	$ 26,900
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	64	$ 270	$ 17,300
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 64,000	$ 64,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	17120	$ 1	$ 17,200
Americus Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	14,880	$ 20	$ 297,600
3" Low Pressure Sewer - PVC	LF	19,200	$ 24	$ 460,800
Grinder Pump Assembly - Simplex	EA	142	$ 4,000	$ 568,000
Abandon Existing Septic Tank	EA	142	$ 420	$ 59,700
Pressure Cleanouts	EA	14	$ 750	$ 10,500
Isolation Valves	EA	14	$ 750	$ 10,500
Service Line Valves	EA	142	$ 270	$ 38,400
Air Release Valves	EA	12	$ 2,900	$ 34,800
Electrical, Instrumentation and Contols	LS	1	$ 64,000	$ 64,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	34,080	$ 1	$ 34,100
Colburn Collection Costs				
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
1 1/4" Low Pressure Sewer Lateral	LF	5,490	$ 20	$ 109,800
3" Low Pressure Sewer - PVC	LF	8,535	$ 24	$ 204,900
Grinder Pump Assembly - Simplex	EA	65	$ 4,000	$ 260,000
Abandon Existing Septic Tank	EA	65	$ 420	$ 27,300
Pressure Cleanouts	EA	7	$ 750	$ 5,300
Isolation Valves	EA	7	$ 750	$ 5,300
Service Line Valves	EA	65	$ 270	$ 17,600
Air Release Valves	EA	6	$ 2,900	$ 17,400
Bore Under Railroad	LF	75	$ 300	$ 22,500
Electrical, Instrumentation and Contols	LS	1	$ 65,000	$ 65,000
Temporary Erosion Control	LS	1	$ 14,000	$ 14,000
Seed & Mulching	SY	14025	$ 1	$ 14,100
Transport System Costs				
Maintenance of Traffic	LS	1	$ 25,000	$ 25,000
4" Forcemain from Americus	LF	4,730	$ 32	$ 151,400
4" Forcemain from Buck Creek	LF	11,400	$ 32	$ 364,800
4" Forcemain from Colburn	LF	1,555	$ 32	$ 49,760
6" Combined Forcemain to Colburn	LF	11,620	$ 50	$ 581,000
6" Forcemain to Delphi	LF	26,290	$ 50	$ 1,314,500
Valves	EA	30	$ 2,500	$ 75,000
Fittings	EA	30	$ 7,500	$ 225,000
Colburn Lift Station (to send to Delphi)	EA	1	$ 250,000	$ 250,000
Chemical Feed System (prevents septicity)	LS	1	$ 120,000	$ 120,000
Electrical, Instrumentation and Contols	LS	1	$ 37,500	$ 37,500
Seeding & Mulching	SY	55,595	$ 1	$ 55,595
Construction Subtotal				**$ 6,669,900**
Contingency (20%)				**$ 1,334,000**
Construction Total				**$ 8,003,900**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 960,500	$ 960,500
Resident Project Representation	LS	1	$ 480,300	$ 480,300
Local Council	LS	1	$ 80,039	$ 80,100
Bond Council	LS	1	$ 120,059	$ 120,100
Land Acquisition	LS	0	$ 9,000	$ -
Financial	LS	1	$ 80,039	$ 80,100
Non-Construction Total				**$ 1,721,100**
Alternative Total Cost				**$ 9,725,000**

Note: All costs are rounded to the nearest $100.

Annual O&M Costs				
Estimated Annual Sewer Connection Costs	1	LS	$ 125,200.00	$ 125,200.00
Collection System Power	1	LS	$ 9,756.00	$ 9,756.00
Labor for Inspection & Maintenance	1	LS	$ 40,650.00	$ 40,650.00
				$ -
			Total Annual O&M:	**$ 175,700**

Cost Estimate - Short Lived Assets						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Annualized Value**
Grinder Pump Replacements	271	0	10	$ 4,000.00	$ 1,084,000.00	$ 108,400.00
Lift Station Pumps	1	0	20	$ 75,000.00	$ 75,000.00	(>15 years)
Electrical	1	0	15	$ 230,500.00	$ 230,500.00	$ 15,366.67
Isolation Valves	28	0	20	$ 750.00	$ 21,000.00	(>15 years)
Service Line Valves	271	0	20	$ 270.00	$ 73,170.00	(>15 years)
Air Release Valves	24	0	20	$ 2,900.00	$ 69,600.00	(>15 years)
Piping	1	0	40	$ 3,913,260.00	$ 3,913,260.00	(>15 years)
					Total Annual SLA:	**$ 123,766.67**

Cost Estimate - Salvage Value						
Item	**Quantity**	**Age of Item**	**Expected Life**	**Value of Each**	**Replacement Value**	**Salvage Value at end of 20 Yrs**
Grinder Pump Replacements	271	0	10	$ 4,000.00	$ 1,084,000.00	$ -
Lift Station Pumps	1	0	20	$ 75,000.00	$ 75,000.00	$ -
Electrical	1	0	15	$ 230,500.00	$ 230,500.00	$ 154,435.00
Isolation Valves	28	0	20	$ 750.00	$ 21,000.00	$ -
Service Line Valves	271	0	20	$ 270.00	$ 73,170.00	$ -
Air Release Valves	24	0	20	$ 2,900.00	$ 69,600.00	$ -
Piping	1	0	40	$ 3,913,260.00	$ 3,913,260.00	$ 1,956,630.00
					Total Salvage Value:	**$ 2,111,065.00**

Key
EA - Each
LS - Lump Sum
LF - Lineal Feet
SY - Square Yard

Project: Tippecanoe County

Alternative	Const. Cost	10% Contingency	Non-Const. Cost	Total Project Cost
Buck Creek Ditch Alt.	$ 445,600	$ 89,200	$ 136,600	$ 671,400
Buck Creek Sewer Alt.	$ 488,800	$ 97,800	$ 149,700	$ 736,300
Americus Ditch Alt.	$ 322,100	$ 64,500	$ 106,400	$ 493,000
Americus Sewer Alt.	$ 159,900	$ 32,000	$ 66,500	$ 258,400
Colburn Ditch Alt.	$ 279,800	$ 56,000	$ 85,900	$ 421,700
				$ 2,580,800

Tippecanoe

Buck Creek Ditch Modification Alternative

Cost Estimate - Buck Creek Ditch Modification Alternative				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 4,000	$ 4,000
Mobilization/Demobilization (3%)	LS	1	$ 12,861	$ 12,900
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
Ditch Modification	LF	10,700	$ 15	$ 160,500
Driveway Culverts	LF	2,150	$ 80	$ 172,000
Driveway Restoration	SY	1,433	$ 25	$ 35,900
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	14267	$ 3	$ 42,800
Construction Subtotal				**$ 445,600**
Contingency (20%)				**$ 89,200**
Construction Total				**$ 534,800**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 85,600	$ 85,600
Resident Project Representation	LS	1	$ 32,100	$ 32,100
Local Council	LS	1	$ 5,348	$ 5,400
Bond Council	LS	1	$ 8,022	$ 8,100
Land Acquisition	LS	0	$ 9,000	$ -
Financial	LS	1	$ 5,348	$ 5,400
Non-Construction Total				**$ 136,600**
Alternative Total Cost				**$ 671,400**

Note: All costs are rounded to the nearest $100.

Tippecanoe

Americus Ditch Modification Alternative

Cost Estimate - Americus Ditch Modification Alternative				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 4,000	$ 4,000
Mobilization/Demobilization (3%)	LS	1	$ 9,264	$ 9,300
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
Ditch Modification	LF	7,700	$ 15	$ 115,500
Driveway Culverts	LF	1,500	$ 80	$ 120,000
Driveway Restoration	SY	1,000	$ 25	$ 25,000
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	10267	$ 3	$ 30,800
Construction Subtotal				**$ 322,100**
Contingency (20%)				**$ 64,500**
Construction Total				**$ 386,600**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 69,600	$ 69,600
Resident Project Representation	LS	1	$ 23,200	$ 23,200
Local Council	LS	1	$ 3,866	$ 3,900
Bond Council	LS	1	$ 5,799	$ 5,800
Land Acquisition	LS	0	$ 9,000	$ -
Financial	LS	1	$ 3,866	$ 3,900
Non-Construction Total				**$ 106,400**
Alternative Total Cost				**$ 493,000**

Note: All costs are rounded to the nearest $100.

Tippecanoe

Colburn Ditch Modification Alternative

Cost Estimate - Colburn Ditch Modification Alternative				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 4,000	$ 4,000
Mobilization/Demobilization (3%)	LS	1	$ 8,030	$ 8,100
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
Ditch Modification	LF	6,550	$ 15	$ 98,250
Driveway Culverts	LF	1,300	$ 80	$ 104,000
Driveway Restoration	SY	867	$ 25	$ 21,700
Temporary Erosion Control	LS	1	$ 10,000	$ 10,000
Seed & Mulching	SY	8733	$ 3	$ 26,200
Construction Subtotal				**$ 279,800**
Contingency (20%)				**$ 56,000**
Construction Total				**$ 335,800**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 53,800	$ 53,800
Resident Project Representation	LS	1	$ 20,200	$ 20,200
Local Council	LS	1	$ 3,358	$ 3,400
Bond Council	LS	1	$ 5,037	$ 5,100
Land Acquisition	LS	0	$ 9,000	$ -
Financial	LS	1	$ 3,358	$ 3,400
Non-Construction Total				**$ 85,900**
Alternative Total Cost				**$ 421,700**

Note: All costs are rounded to the nearest $100.

Tippecanoe

Buck Creek Storm Sewer Alternative

Cost Estimate - Buck Creek Storm Sewer Alternative				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 4,000	$ 4,000
Mobilization/Demobilization (3%)	LS	1	$ 14,118	$ 14,200
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
West Trunk Sewer - 36"	LF	775	$ 95	$ 73,700
Pipe End Section - 36"	EA	1	$ 1,500	$ 1,500
West Trunk Sewer - 24"	LF	340	$ 70	$ 23,800
West Trunk Sewer - 18"	LF	470	$ 60	$ 28,200
East Trunk Sewer - 36"	LF	400	$ 95	$ 38,000
Pipe End Section - 36"	EA	1	$ 1,500	$ 1,500
East Trunk Sewer - 30"	LF	400	$ 80	$ 32,000
12" Inlet Piping	LF	300	$ 45	$ 13,500
Manholes	EA	12	$ 4,000	$ 48,000
Inlets	EA	15	$ 2,000	$ 30,000
Backfill	CY	2,800	$ 30	$ 84,000
Pavement Restoration, Roadway	SY	1,750	$ 45	$ 78,800
Temporary Erosion Control	LS	1	$ 8,000	$ 8,000
Seed & Mulching	SY	700	$ 3	$ 2,100
Construction Subtotal				**$ 488,800**
Contingency (20%)				**$ 97,800**
Construction Total				**$ 586,600**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 93,900	$ 93,900
Resident Project Representation	LS	1	$ 35,200	$ 35,200
Local Council	LS	1	$ 5,866	$ 5,900
Bond Council	LS	1	$ 8,799	$ 8,800
Land Acquisition	LS	0	$ 9,000	$ -
Financial	LS	1	$ 5,866	$ 5,900
Non-Construction Total				**$ 149,700**
Alternative Total Cost				**$ 736,300**

Note: All costs are rounded to the nearest $100.

Tippecanoe

Americus Storm Sewer Alternative

Cost Estimate - Americus Storm Sewer Alternative				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Construction Layout	LS	1	$ 4,000	$ 4,000
Mobilization/Demobilization (3%)	LS	1	$ 4,539	$ 4,600
Maintenance of Traffic	LS	1	$ 7,500	$ 7,500
Trunk Sewer - 36"	LF	400	$ 95	$ 38,000
Pipe End Section - 36"	EA	1	$ 1,500	$ 1,500
Trunk Sewer - 30"	LF	400	$ 80	$ 32,000
12" Inlet Piping	LF	160	$ 45	$ 7,200
Manholes	EA	3	$ 4,000	$ 12,000
Inlets	EA	8	$ 2,000	$ 16,000
Backfill	CY	550	$ 30	$ 16,500
Pavement Restoration, Roadway	SY	225	$ 45	$ 10,200
Temporary Erosion Control	LS	1	$ 8,000	$ 8,000
Seed & Mulching	SY	800	$ 3	$ 2,400
Construction Subtotal				**$ 159,900**
Contingency (20%)				**$ 32,000**
Construction Total				**$ 191,900**
Non-Construction Costs				
Item	**Unit**	**Quantity**	**Unit Price**	**Cost**
Design/Bidding/Engineering	LS	1	$ 48,000	$ 48,000
Resident Project Representation	LS	1	$ 11,600	$ 11,600
Local Council	LS	1	$ 1,919	$ 2,000
Bond Council	LS	1	$ 2,879	$ 2,900
Land Acquisition	LS	0	$ 9,000	$ -
Financial	LS	1	$ 1,919	$ 2,000
Non-Construction Total				**$ 66,500**
Alternative Total Cost				**$ 258,400**

Note: All costs are rounded to the nearest $100.