

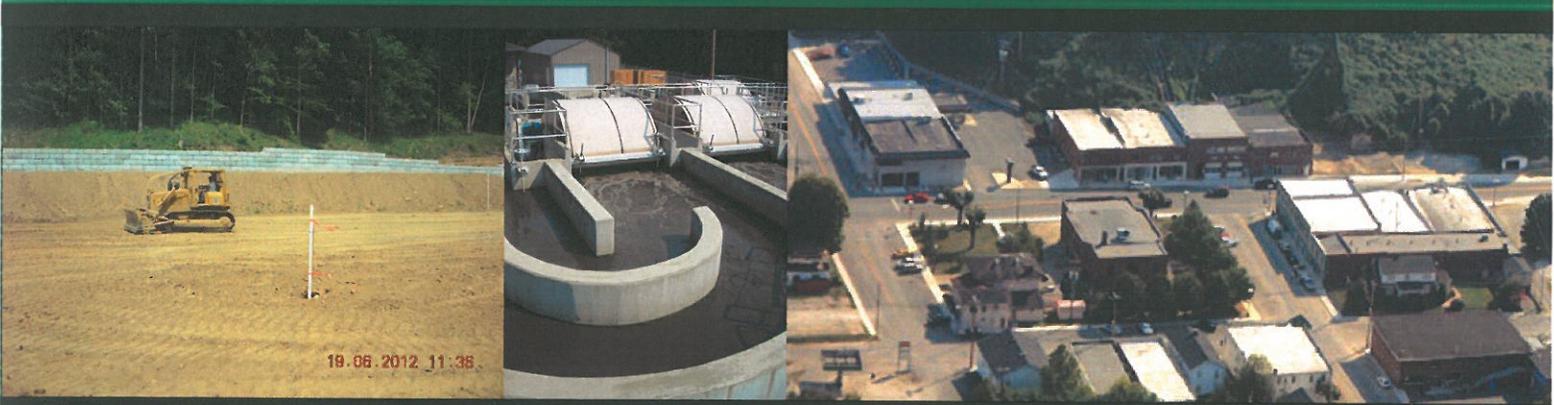


nesbitt engineering, inc.

April 2013

City of McKee

Regional Facility Plan
Released for Public and Agency Review



City of McKee

PREPARED BY:
Nesbitt Engineering, Inc.
Office in Lexington

Providing
Proven
Solutions Since 1976



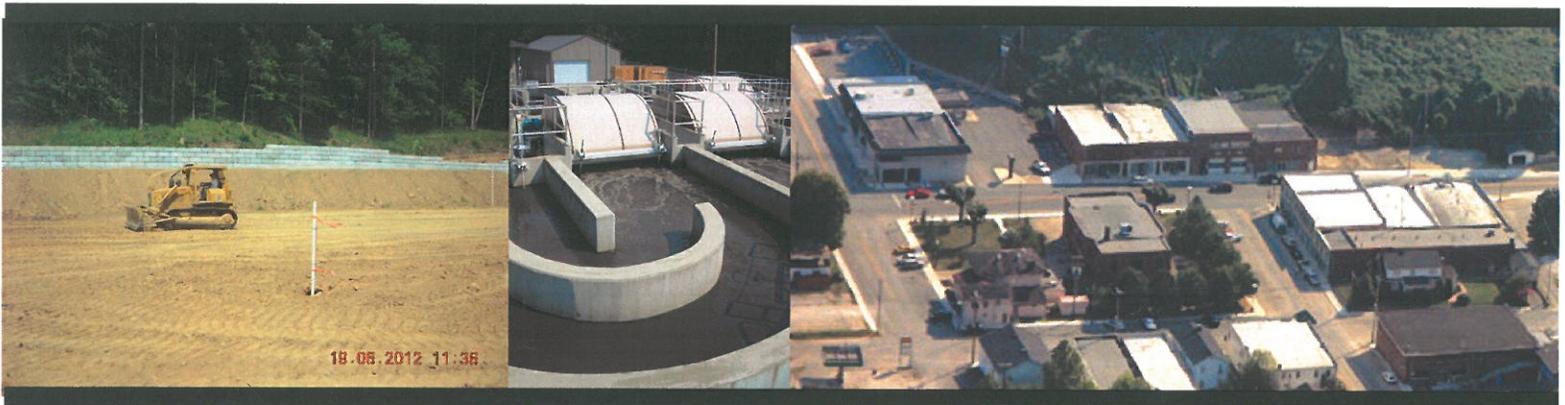
nesbitt engineering, inc.
providing proven solutions since 1976

227 North Upper Street
Lexington, KY 40507-1016

April 2013

City of McKee

Regional Facility Plan Released for Public and Agency Review



City of McKee

PREPARED BY:
Nesbitt Engineering, Inc.
Office in Lexington

Providing

Proven

Solutions Since 1976

Table of Contents

Regional Facility Plan Summary.....Section 1 Pages 1 – 5

- Figure 1-1 McKee Location Map
- Figure 1-2 Existing Sewer System Map
- Figure 1-3 USGS with Sanitary Sewer Phases
- Figure 1-4 USGS with Sanitary Sewer Phases

Statement of Purpose and NeedSection 2 Pages 1 – 1

Physical Characteristics of the Planning AreaSection 3 Pages 1 – 2

- Figure 3-1 Overall Planning Area Map
- Figure 3-2 Existing Water and Wastewater Facilities
- Figure 3-3 USGS with Sanitary Sewer Phases
- Figure 3-4 USGS with Sanitary Sewer Phases
- Figure 3-5 NFIP Flood Insurance Rate Map

Socioeconomic Characteristics of the Planning Area.....Section 4 Pages 1 – 2

Existing Environment in the Planning AreaSection 5 Pages 1 – 6

Existing Wastewater SystemSection 6 Pages 1 – 11

- Figure 6-1 Process Flow Diagram
- Exhibit 6-1 City of McKee, Infiltration and Inflow Evaluation

Forecasts of Flows and Waste Loads in the Planning AreaSection 7 Pages 1 – 4

- Exhibit 7-1 Kentucky Division of Water, WLA 11/17/11

Evaluation of AlternativesSection 8 Pages 1 – 8

- Exhibit 8-1 Opinion of Probable Cost – Alternative A: 0.50 MGD Oxidation Ditch System
- Figure 8-1 Process Flow Schematic – Alternative A: 0.50 MGD Oxidation Ditch System
- Exhibit 8-2 Opinion of Probable Cost – Alternative B: 0.50 MGD Sequencing Batch Reactor System
- Figure 8-2 Process Flow Schematic - Alternative B: 0.50 MGD Sequencing Batch Reactor System
- Exhibit 8-3 Opinion of Probable Cost – Alternative C: 0.50 MGD Aerated Lagoon System
- Figure 8-3 Process Flow Schematic – Alternative C: 0.50 MGD Aerated Lagoon System

Table of Contents

Exhibit 8-4 Probable Opinion of Project Cost - Phase 1: US 421 – East from McKee to Sandgap

Exhibit 8-5 Probable Opinion of Project Cost - Phase 2 Sewers: McKee South on KY 421 to Tyner, West on KY 30 to Annville

Exhibit 8-6 Probable Opinion of Project Cost - Phase 3: KY 290 – South from McKee to Annville

Cross-Cutter Correspondence and MitigationSection 9 Page 1 – 2

Exhibit 9-1 U.S. Fish and Wildlife Service Correspondence

Exhibit 9-2 Kentucky Department of Fish and Wildlife Resources Correspondence

Exhibit 9-3 Kentucky Heritage Council Correspondence

Exhibit 9-4 U.S. Army Corps of Engineers Correspondence

Exhibit 9-5 Natural Resources and Conservation Service Correspondence

Evaluation of Recommended PlanSection 10 Pages 1 – 8

Figure 10-1 Existing and Proposed Wastewater Treatment Plant Map

Figure 10-2 Selected Treatment Process

Documentation of Public Participation Section 11 Page 1 - 1

Exhibit 11-1 Newspaper Advertisement

Exhibit 11-2 Flyer Advertisement

Exhibit 11-3 Power Point Presentation to the Public

Exhibit 11-4 Public Meeting Attendance Sheet

Exhibit 11-5 Public Comments/ Meeting Notes

Regional Facility Plan Completeness Checklist and FormsSection 12 Pages 1 – 5

Checklist Spreadsheet – Unit Process Design Criteria

Checklist Spreadsheet – Design Flows and Concentraiton

APPENDICES

Agreed Order and Subsequent Corrective Action PlanAppendix 1

Section 1: Regional Facility Plan Summary

1. Purpose

The City of McKee, in Jackson County, Kentucky currently collects and treats sewage from approximately 249 customers (equivalent population of 1,039), ranging from individual households to apartment complexes (treated here as a single customer), schools and large commercial operations. The collection system and sewage treatment plant were originally constructed in the mid 1970's. The sewers in downtown McKee were replaced in the early 2000's.

Both the collection system and the wastewater treatment plant (WWTP) have had a history of problems. The collection system consisting of about eight miles of sewer and one pump station, has exhibited excessive infiltration and inflow (I/I), resulting in KPDES permit violations from the wastewater treatment plant during and following significant rain events. The WWTP plant, which is permitted for 0.17 MGD, consists largely of steel package plants, which are nearing the end of their useful life.

In March, 2007, the City of McKee entered into an Agreed Order with the Environmental and Public Protection Cabinet. The Agreed Order recognized that the WWTP is hydraulically overloaded and placed the City of McKee on the Sewer Sanction List as one of its conditions. Subsequent and ongoing sewer investigation and repair have addressed the major sources of I/I. However, in anticipation of replacing the WWTP in the foreseeable future, just enough maintenance is performed to keep it in an operable condition.

McKee, which is the Jackson County seat, is centrally located in the county with the community of Sandgap to the northwest, Tyner to the southeast and Annville to the south. None of these communities have a central sewer system, although there are several package treatment plants serving individual commercial or institutional entities.

This Regional Facilities Plan Update largely focuses on the immediate needs of the City of McKee; that is the 0-5 year planning period. After resolving its current treatment problems, the City of McKee plans to extend sewers into Jackson County.

2. Recommended Alternative

The following treatment and collection alternatives are proposed.

A. Wastewater Treatment, 0-5 Years

Construct a new 0.5 MGD oxidation ditch wastewater treatment plant on a property about 2,000 feet north of and adjacent to the existing WWTP site. The treatment plant will have sufficient capacity to handle all current flow conditions, and to accept a substantial amount of additional flow, thereby allowing for sewer extensions to pick up new customers (See Table 1-1). It will also be constructed to easily accommodate expansion as needed in the future. Additionally, the existing 8" force main will be extended from the existing WWTP to the new one, and the associated pump station will be upgraded to meet the anticipated flow and head conditions.

Section 1: Regional Facility Plan Summary

In anticipation of constructing the new WWTP, the City of McKee has purchased the adjacent property, performed earthwork to prepare the site for the WWTP, and has built a new roadway entrance and bridge over the Birch Lick Creek for access to the site.

Figure 1-1 provides a location map of city of McKee. Figure 1-2 shows the general layout of existing sewage collection system and location of the existing WWTP. This figure also identifies the site for the proposed WWTP and the sewer extension to it.

B. Collection, Future Phases

After construction of a new wastewater treatment plant, the City of McKee plans to extend sewers into the outlying regions. The first of these sewer projects are anticipated to be at least five years in the future, and will be performed as funds become available. Sewers will first extend along US 421 northwest to Sandgap, then south along US 421 to Tyner, and from there, west along KY 30 to Annville. Finally, sewers will extend south from McKee along KY 290 south towards Annville. These phased extensions are shown in Figures 1-3 and 1-4.

C. Current and Projected Flow

Table 1-1 summarizes the average daily and maximum monthly flows, rounded to the nearest 1,000 gpd, calculated for planning purposes.

Table 1-1
Current and Projected Flows

Description	Average Daily Flow		Maximum Monthly Flow	
	current	20-yrs	current	20-yrs
Current - City of McKee	133,000	137,000	242,000	250,000
Future Sewer Extensions	240,000	247,000	437,000	450,000
Total	373,000	385,000	679,000	700,000

D. Institutional Arrangements

The City of McKee will construct, own and operate the proposed facilities, all within their existing Planning Area, or within newly established Planning Area that is currently undesignated. Because sewers will be extended into the outlying county (after the 0-5 year planning period), it will eventually be necessary for the Jackson County Fiscal Court to adopt a Sewer Use Ordinance and hand over authority to the City of McKee.

Section 1: Regional Facility Plan Summary

3. Cost

A. Project Costs

Table 1-2 summarizes the capital costs for the selected alternatives. Following construction of the new wastewater treatment plant, sewers will be extended into the outlying region. For purposes of this analysis, the extensions are broken down into approximate \$1.0MM projects.

Table 1-2
Project Phasing and Costs

Phase	Description	Equivalent Population	Construction	Development & Contingency	Project
New WWTP		1331	\$ 3,860,000	930,000	\$ 4,790,000
1A	US 421 - East from McKee to Sandgap	141	780,000	234,000	1,000,000
1B		198	780,000	234,000	1,000,000
1C		307	760,000	228,000	1,000,000
2A	KY 421- South from McKee to Tyner	187	860,000	258,000	1,100,000
2B		105	740,000	222,000	1,000,000
2C	KY 30 - West From Tyner to Annville	265	850,000	255,000	1,100,000
2D		840	980,000	294,000	1,300,000
2E		177	720,000	216,000	900,000
3A	KY 290 - South from McKee to Annville	136	790,000	237,000	1,000,000
3B		47	530,000	159,000	700,000
Sewer Total		2,402			\$ 10,100,000
Grand Total		3,733			\$ 14,890,000

B. Funding Plan

The Funding Plan discussed herein addresses the wastewater treatment plant project proposed for the 0-5 Year Planning Area only. A funding plan for work beyond that timeframe would involve so many unknown variables (such as future rates, future construction costs, future customer base, interest rates, grant availability, etc.) that a funding analysis would not yield useful results at this time.

The opinion of probable project cost for the wastewater treatment plant is \$4,790,000. The selected alternative will also incur costs for operations, maintenance and

Section 1: Regional Facility Plan Summary

replacement (O,M&R), which based on cost analysis developed in Section 10, is \$134,000 annually.

Currently, the city of McKee has about \$1,000,000 remaining of \$2,039,000 in line-item funds administered by the Kentucky Infrastructure Authority for design and construction. The remaining project costs will be covered through a combination of grants and loans. Sufficient grant funding will be necessary such that the amount borrowed will not result in excessive user rates. Table 1-3 provides one such scenario.

Table 1-3
Project Funding Plan

Total project cost	\$ 4,790,000
RD Grant	1,500,000
KIA Grant	1,000,000
ARC Grant	500,000
CDBG Grant	1,000,000
Total Grants	4,000,000
Total Funds to Borrow	\$ 790,000

A detailed analysis in Section 10 steps through the process of calculating the resulting impact on user rates that are summarized in Table 1-4. Two alternatives are considered, a 20-year KIA loan and a 38-year RD loan. Based on this analysis, either option is feasible.

Table 1-4
User Fee Impact on In-City Residential Customers

	Monthly Fee (\$)	
	@ 3,604 gal/mo	@ 4,000 gal/mo
Current Average Residential Monthly Bill	32.21	34.07
Average Residential Monthly Bill with KIA Loan	40.66	43.00
Average Residential Monthly Bill with RD Loan	38.35	44.56

Rates are calculated based on the historical average monthly flow per residential customer, and on a standardized comparison basis of 4,000 gallons per month.

The selection of a KIA loan versus an RD loan is largely a matter of preference. If the higher rate can be tolerated with a KIA loan, the obvious advantage of paying off the loan on 20 years instead of 38 is an obvious advantage.

Section 1: Regional Facility Plan Summary

4. Planning Agency

As noted above, the City of McKee will construct, own and operate the proposed facilities, all within their existing Planning Area, or within newly established Planning Area that is currently undesignated. The 0-5 year phase will be wholly contained within the city of McKee and will be managed through the existing institutional structure, with no need for changes or intermunicipal agreements. Detailed mapping of existing and proposed Planning Areas is provided in Section 3 of this Regional Facility Plan Update.

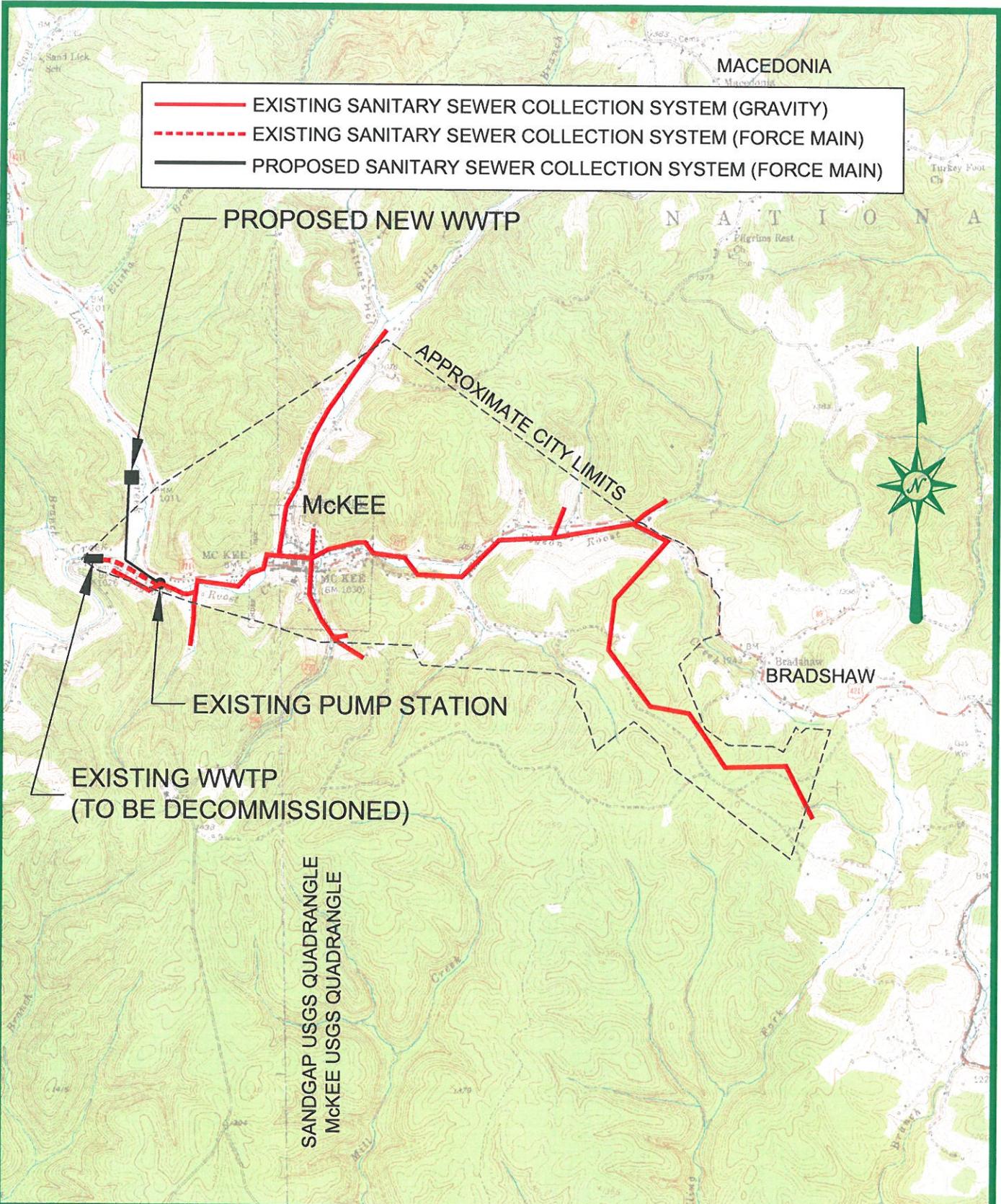
In future phases, as sewers are extended into the outlying county, it will be necessary for the Jackson County Fiscal Court to adopt a Sewer Use Ordinance and hand over authority to the City of McKee. Discussions have been held with the Jackson County Fiscal Court Judge, but no formal arrangements have been made at this time.

5. Schedule

Table 1-5 is a proposed implementation schedule for the projects outlined in this report. The wastewater treatment plant will be constructed within the first five years. Thereafter, the ensuing phases of work are generally separated into moderately sized sewer extension projects of approximately \$1.0MM project cost, with the intent that they can be quickly implemented due to their relative small size.

Table 1-5
Proposed Implementation Schedule

Phase	Description	Completion Date	
		Design	Construction
0-5yr	McKee WWTP	July, 2013	Dec, 2016
1A	421 North to Waneta	Jan, 2018	Dec, 2018
1B	421 North to Sandgap	Jan, 2019	Dec, 2019
1C	Sandgap	Jan, 2020	Dec, 2020
2A	421 South to Grey Hawk	Jan, 2021	Dec, 2021
2B	421 South to Tyner	Jan, 2022	Dec, 2022
2C	30 West to Annville	Jan, 2023	Dec, 2023
2D	Annville West	Jan, 2024	Dec, 2024
2E	Annville East	Jan, 2025	Dec, 2025
3A	290 South to Olin	Jan, 2026	Dec, 2026
3B	290 South to Annville	Jan, 2025	Dec, 2027

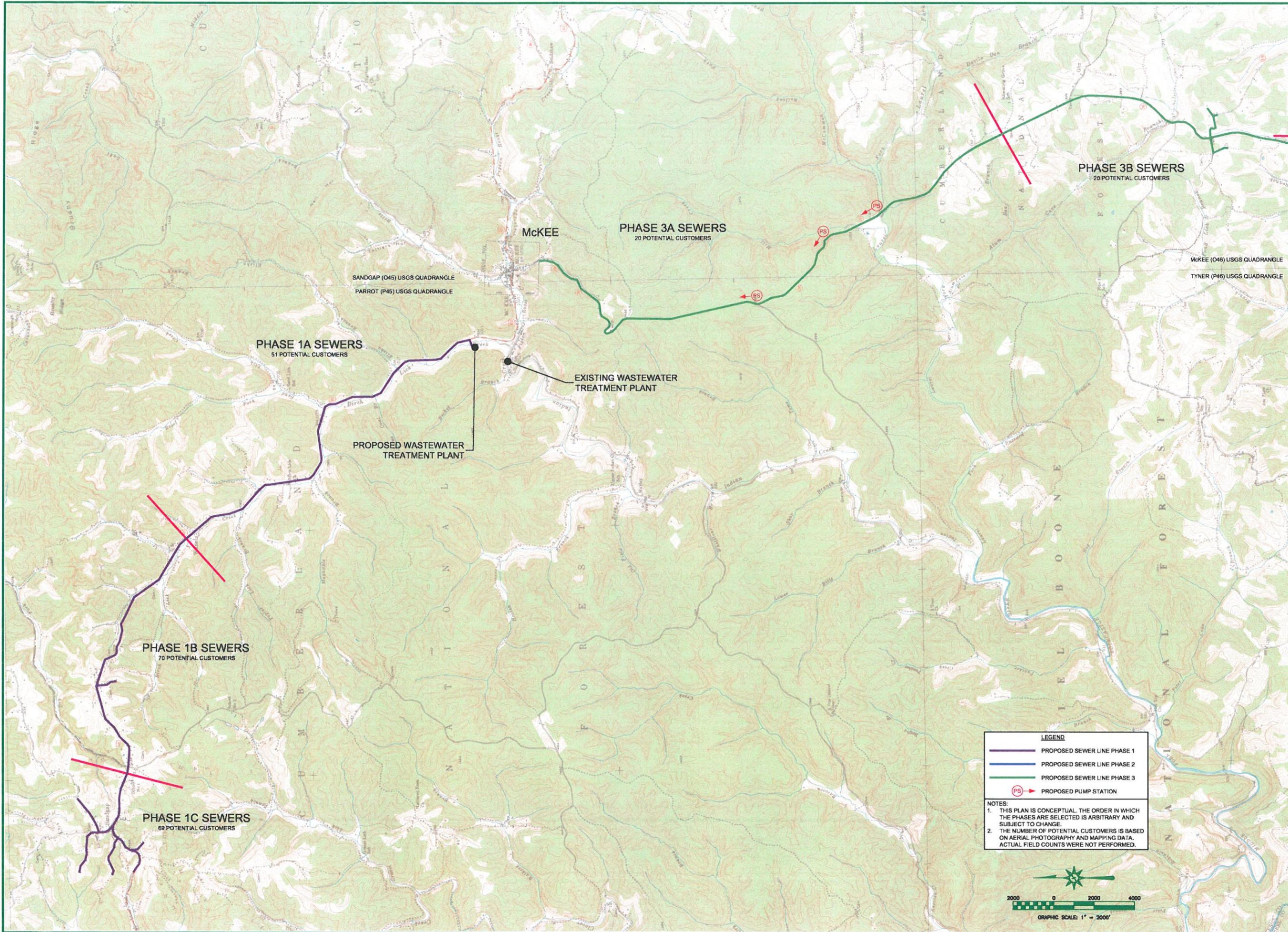


nesbitt engineering, inc.
providing proven solutions since 1976

**SANITARY SEWER COLLECTION SYSTEM
 & WASTEWATER TREATMENT PLANT
 CITY OF McKEE, KENTUCKY**

FIGURE 1-2

drawn by: MBc	disk/file name: \\REPORT\SECTION 1\DWG\FIGURE 1-2.DWG	job no.: 1098.10
date: 2-18-13	last plot date:	scale: 1" = 3000'



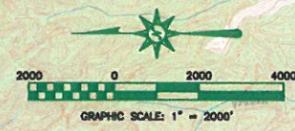
LAST PLOTTED: LAST SAVED:	
CITY OF McKEE JACKSON COUNTY, KENTUCKY REGIONAL FACILITY PLAN CUMBERLAND VALLEY AREA DEVELOPMENT DIST. USGS WITH SANITARY SEWER PHASES	
nesbitt engineering, inc. <small>providing proven solutions since 1976</small> CITY OF McKEE, JACKSON COUNTY, KENTUCKY REGIONAL FACILITY PLAN	
Drawn by: JCW	Job no.: 1098.10 Scale: 1" = 2000'
Report Section: 1-DWG Figure 1-3 AND 1-4.DWG Sheet no.: 2-18-13	
	
FIGURE 1-3	

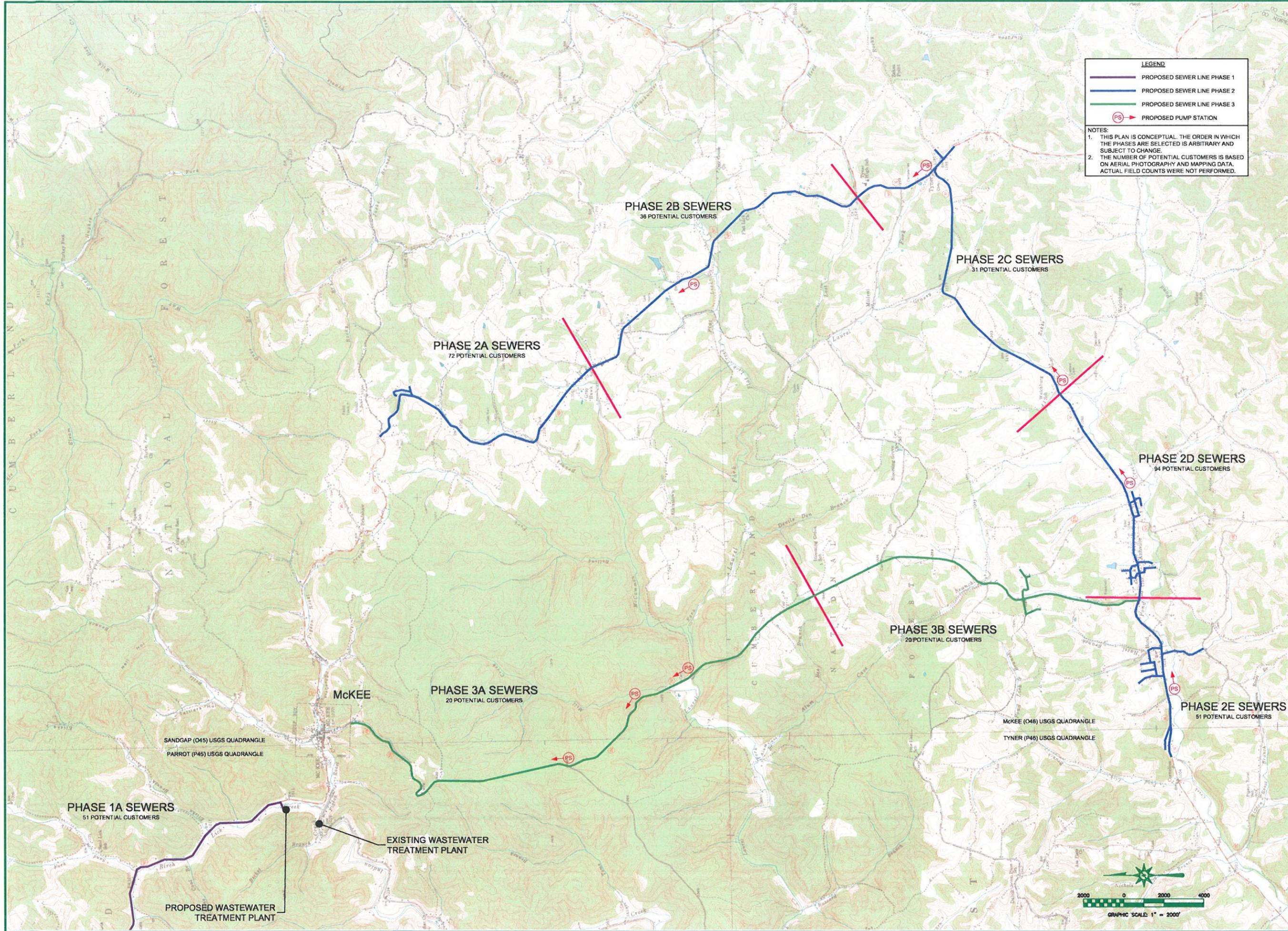
LEGEND

- PROPOSED SEWER LINE PHASE 1
- PROPOSED SEWER LINE PHASE 2
- PROPOSED SEWER LINE PHASE 3
- (PS) → PROPOSED PUMP STATION

NOTES:

1. THIS PLAN IS CONCEPTUAL. THE ORDER IN WHICH THE PHASES ARE SELECTED IS ARBITRARY AND SUBJECT TO CHANGE.
2. THE NUMBER OF POTENTIAL CUSTOMERS IS BASED ON AERIAL PHOTOGRAPHY AND MAPPING DATA. ACTUAL FIELD COUNTS WERE NOT PERFORMED.





LEGEND

- PROPOSED SEWER LINE PHASE 1
- PROPOSED SEWER LINE PHASE 2
- PROPOSED SEWER LINE PHASE 3
- PROPOSED PUMP STATION

NOTES:

- THIS PLAN IS CONCEPTUAL. THE ORDER IN WHICH THE PHASES ARE SELECTED IS ARBITRARY AND SUBJECT TO CHANGE.
- THE NUMBER OF POTENTIAL CUSTOMERS IS BASED ON AERIAL PHOTOGRAPHY AND MAPPING DATA. ACTUAL FIELD COUNTS WERE NOT PERFORMED.

LAST PLOTTED:
LAST SAVED:

**CITY OF MCKEE
JACKSON COUNTY, KENTUCKY
REGIONAL FACILITY PLAN
CUMBERLAND VALLEY AREA DEVELOPMENT DIST.
USGS WITH SANITARY SEWER PHASES**

nesbitt engineering, inc.
providing proven solutions since 1976
CITY OF MCKEE, JACKSON COUNTY, KENTUCKY
REGIONAL FACILITY PLAN

DATE: 2-18-13
DRAWN BY: JCW
JOB NO.: 1098.10
SCALE: 1" = 2000'
REPORT SECTION: 1\DWG\Figure 1-3 AND 1-4.DWG

FIGURE 1-4

Section 2: Statement of Purpose and Need

Pursuant to 401 KAR 5:006, Section 2, the City of McKee is updating their Regional Facility Plan for approval to construct a new wastewater treatment plant and to extend its service to outlying communities. Several conditions as noted below lead to the need for this Plan Update.

- In 2006, the Division of Water and the City of McKee entered into an Agreed Order. One of the conditions of the order was to place McKee on the Sewer Sanction list due to a hydraulic loading in excess of 90% design capacity. To address this situation, a new WWTP with greater capacity than currently provided is necessary.
- The existing wastewater treatment plant was constructed in a piecemeal manner, much of which consists of steel package treatment units. Portions of the plant date back to the early 1970's. As such, it is nearing the end of its useful life. It can be difficult to operate, and is susceptible to periodic process upsets during periods of high flow during wet weather. Regardless of the Agreed Order, this project is necessary to ensure the long-term viability of reliable sewage treatment for the City of McKee.
- With the exception of a few package treatment plants that serve specific entities, such as a school, the surrounding communities rely on individual septic systems. Construction of a new WWTP and eventual extension of sewers in these areas will provide a more reliable means of sewage treatment and disposal for the region. Without this project, the environment and health of the surrounding area will remain at risk as septic systems fail and/or are not properly maintained.
- Economic development is adversely affected by the absence of reliable WWTP. Without the project, economic growth in the area will be effectively halted. This project will ultimately extend sewers to the nearby communities of Sandgap, Tyner and Annville. In particular, the new KY Hwy 30E which connects Annville to London, has the potential to spur growth in the area.

Section 3: Physical Characteristics of the Planning Area

1. Geographic and Watershed Boundaries

Figure 3-1. *Overall Planning Area Map* (See report Pocket for a full-size drawing.), depicts the existing and proposed McKee Planning Area boundaries, the McKee corporate limits, Jackson county boundary, areas of concentrated population, watershed boundaries and the proposed project phases.

The current McKee Planning Area covers most of the corporate limits of McKee, plus roughly two-mile extensions along US 421 to the east and along Hwy 89 to the north and south. These extensions primarily project into areas of relative dense population.

This Regional Facility Plan Update proposes to extend the McKee Planning Area to other regions of concentrated population; namely the communities of Sand Gap to the northwest, and Tyner and Annville to the south. The highways between McKee and these communities are also moderately populated, and are incorporated into the proposed expanded Planning Area.

The proposed Planning Area largely follows watershed boundaries to encompass all of the existing or proposed sewer lines. Each individual watershed is named and has its individual 14 digit Hydrologic Unit Codes (HUC) number shown.

2. Water Sources and Utilities in the Planning Area

Known public water sources and utilities in the Planning Area are identified on Figure 3-2, *Existing Water and Wastewater Facilities* (See report Pocket for a full-size drawing). There are public water intakes at the McKee City Reservoir, and two Jackson County Water Association, Inc. locations in the central portion of the county.

3. USGS Topographic Map

Figures 3-3 and 3-4 depict the site of the proposed WWTP and sewer line extensions on USGS topographic map quadrangles as noted on the drawings (See report Pocket for a full-size drawing.)

4. Floodplain Map

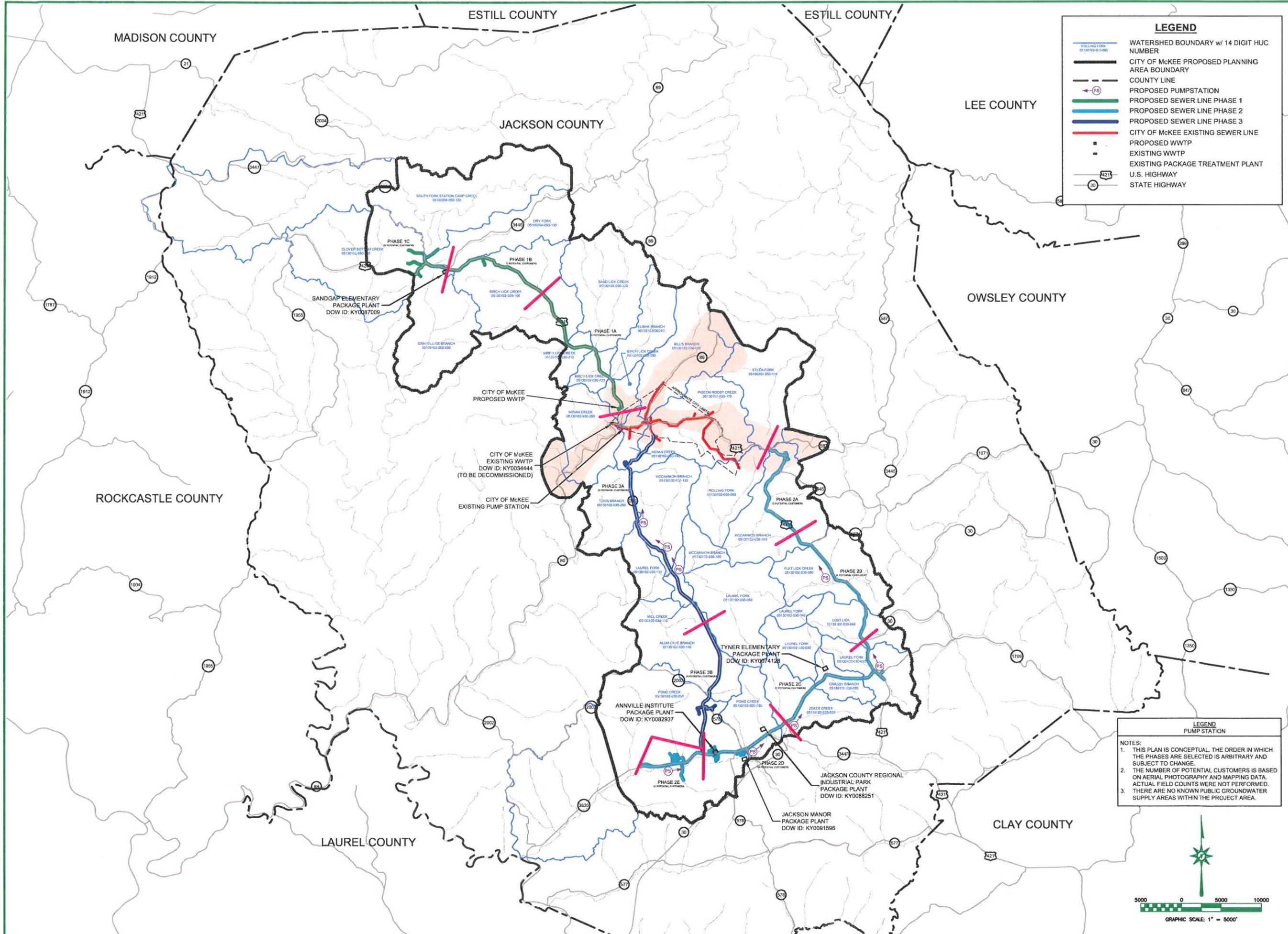
Figure 3-5 is a section of FEMA Flood Insurance Rate Map (FIRM), Jackson County, Kentucky, Panel 117 of 275 (21109C0117C). This map includes the sites of the existing and proposed wastewater treatment plants. In 2011, the proposed WWTP site and immediate lowland area was surveyed to gather detailed topographic data. Utilizing this data along with USGS and watershed mapping, a HEC-RAS study was performed for the site. The detailed results of the study generally concur with the FEMA map regarding the limits of the 100-year flood elevation. Thus, the proposed site for the new WWTP has a sizeable section of gently sloping land above the 100-year flood elevation suitable for construction of a wastewater treatment plant.

Section 3: Physical Characteristics of the Planning Area

Flood maps covering the proposed sewer extensions span across 9 panels (*Flood Insurance Rate Maps (FIRM), Jackson County, Panels 109 through 250*). These maps (not included in this document) will be taken into consideration when routing sewers and selecting pump station sites, to minimize the impact of floodwaters on the operation and maintenance of the system. In general, with the exception of stream crossings, the proposed sewers will travel parallel and near to roadways above the 100-year flood elevation.

5. Planning and Zoning Land Use Map

No zoning maps have been created for Jackson County.



LEGEND

- WATERSHED BOUNDARY w/ 14 DIGIT HUC NUMBER
- CITY OF McKEE PROPOSED PLANNING AREA BOUNDARY
- COUNTY LINE
- PROPOSED PUMPSTATION
- PROPOSED SEWER LINE PHASE 1
- PROPOSED SEWER LINE PHASE 2
- PROPOSED SEWER LINE PHASE 3
- CITY OF McKEE EXISTING SEWER LINE
- PROPOSED WWTP
- EXISTING WWTP
- EXISTING PACKAGE TREATMENT PLANT
- U.S. HIGHWAY
- STATE HIGHWAY

LEGEND
PUMP STATION

NOTES:
 1. THIS PLAN IS CONCEPTUAL. THE ORDER IN WHICH THE PHASES ARE SELECTED IS ARBITRARY AND SUBJECT TO CHANGE.
 2. THE NUMBER OF POTENTIAL CUSTOMERS IS BASED ON AERIAL PHOTOGRAPHY AND MAPPING DATA. ACTUAL FIELD COUNTS WERE NOT PERFORMED.
 3. THERE ARE NO KNOWN PUBLIC GROUNDWATER SUPPLY AREAS WITHIN THE PROJECT AREA.

5000 0 5000 10000
 GRAPHIC SCALE: 1" = 5000'

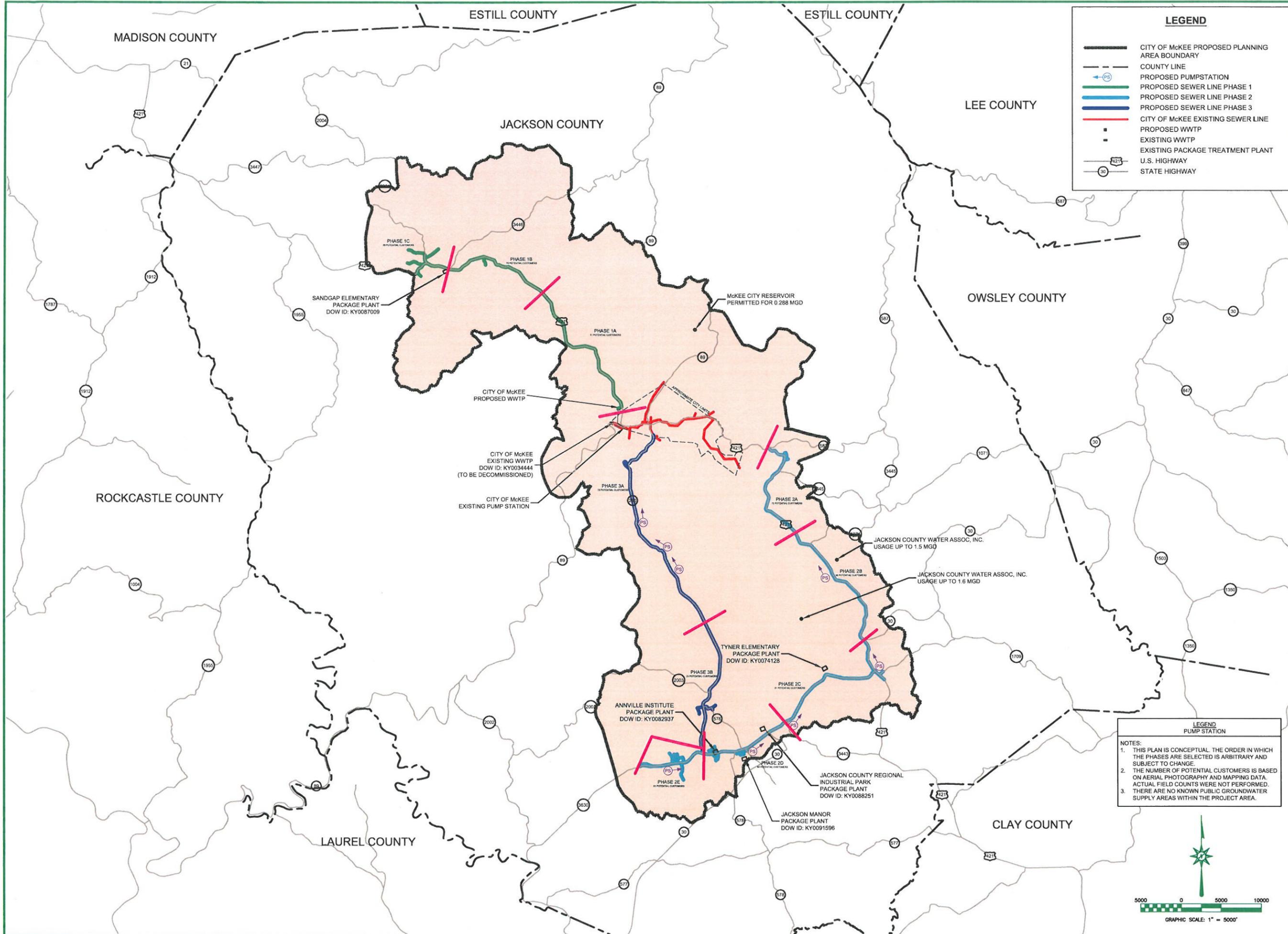
LAST PLOTTED:
 LAST SAVED:

**CITY OF McKEE
 JACKSON COUNTY, KENTUCKY
 REGIONAL FACILITY PLAN
 CUMBERLAND VALLEY AREA DEVELOPMENT DIST.**

OVERALL PLANNING AREA MAP

nesbitt engineering, inc.
 providing proven solutions since 1976
 CITY OF McKEE, JACKSON COUNTY, KENTUCKY
 REGIONAL FACILITY PLAN
 JOB NO.: 1098.10
 SCALE: 1" = 5000'
 DRAWN BY: BMC
 DATE: 3-05-12

sheet no. **FIGURE 3-1**



LEGEND

- CITY OF McKEE PROPOSED PLANNING AREA BOUNDARY
- COUNTY LINE
- PROPOSED PUMPSTATION
- PROPOSED SEWER LINE PHASE 1
- PROPOSED SEWER LINE PHASE 2
- PROPOSED SEWER LINE PHASE 3
- CITY OF McKEE EXISTING SEWER LINE
- PROPOSED WWTP
- EXISTING WWTP
- EXISTING PACKAGE TREATMENT PLANT
- U.S. HIGHWAY
- STATE HIGHWAY

LAST PLOTTED:
LAST SAVED:

**CITY OF McKEE
JACKSON COUNTY, KENTUCKY
REGIONAL FACILITY PLAN
CUMBERLAND VALLEY AREA DEVELOPMENT DIST.
EXISTING WATER AND WASTEWATER FACILITIES**

**LEGEND
PUMP STATION**

NOTES:
1. THIS PLAN IS CONCEPTUAL. THE ORDER IN WHICH THE PHASES ARE SELECTED IS ARBITRARY AND SUBJECT TO CHANGE.
2. THE NUMBER OF POTENTIAL CUSTOMERS IS BASED ON AERIAL PHOTOGRAPHY AND MAPPING DATA. ACTUAL FIELD COUNTS WERE NOT PERFORMED.
3. THERE ARE NO KNOWN PUBLIC GROUNDWATER SUPPLY AREAS WITHIN THE PROJECT AREA.

**LEGEND
PUMP STATION**

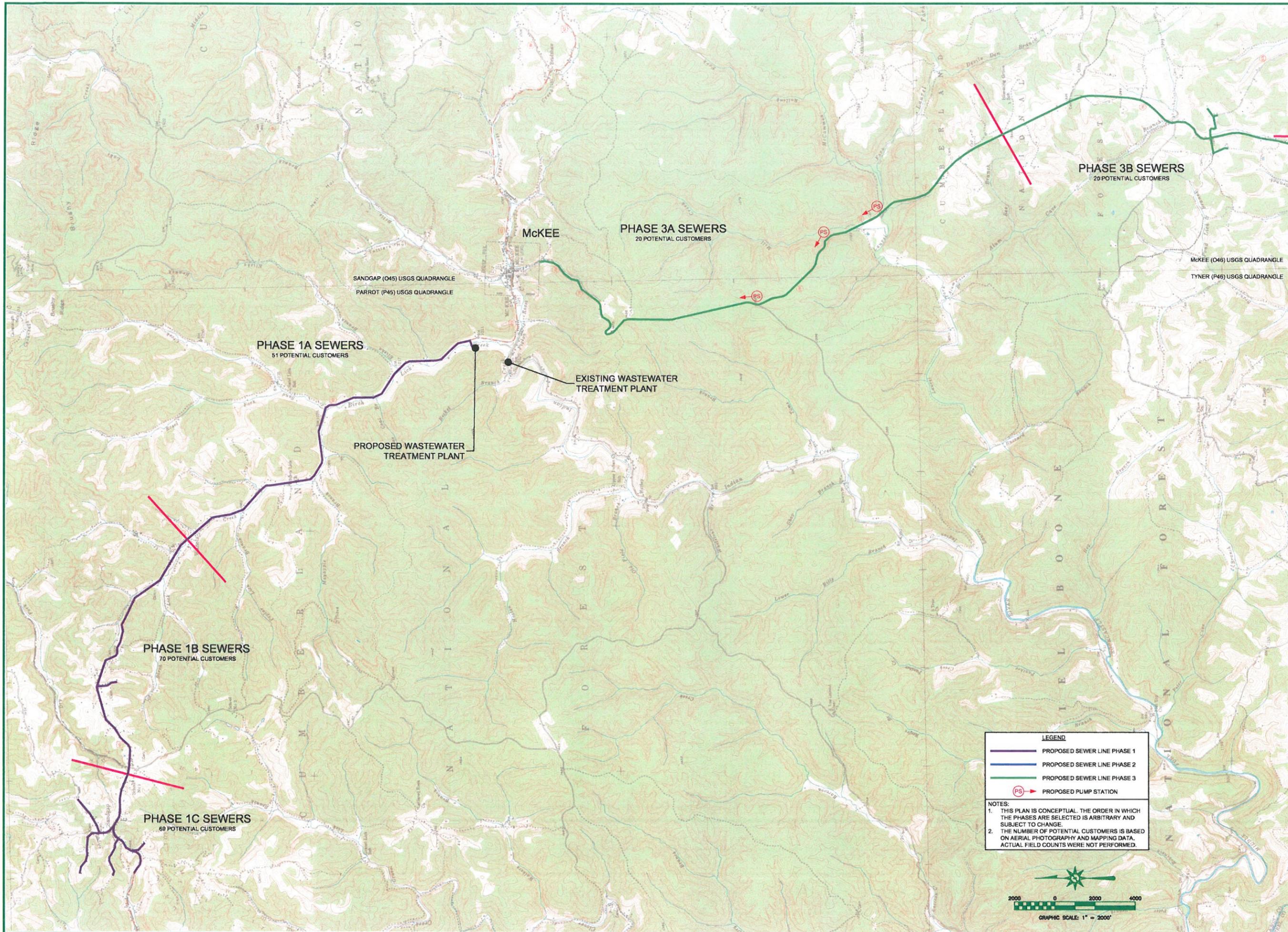
5000 0 5000 10000
GRAPHIC SCALE: 1" = 5000'

nesbitt engineering, inc.
providing proven solutions since 1976

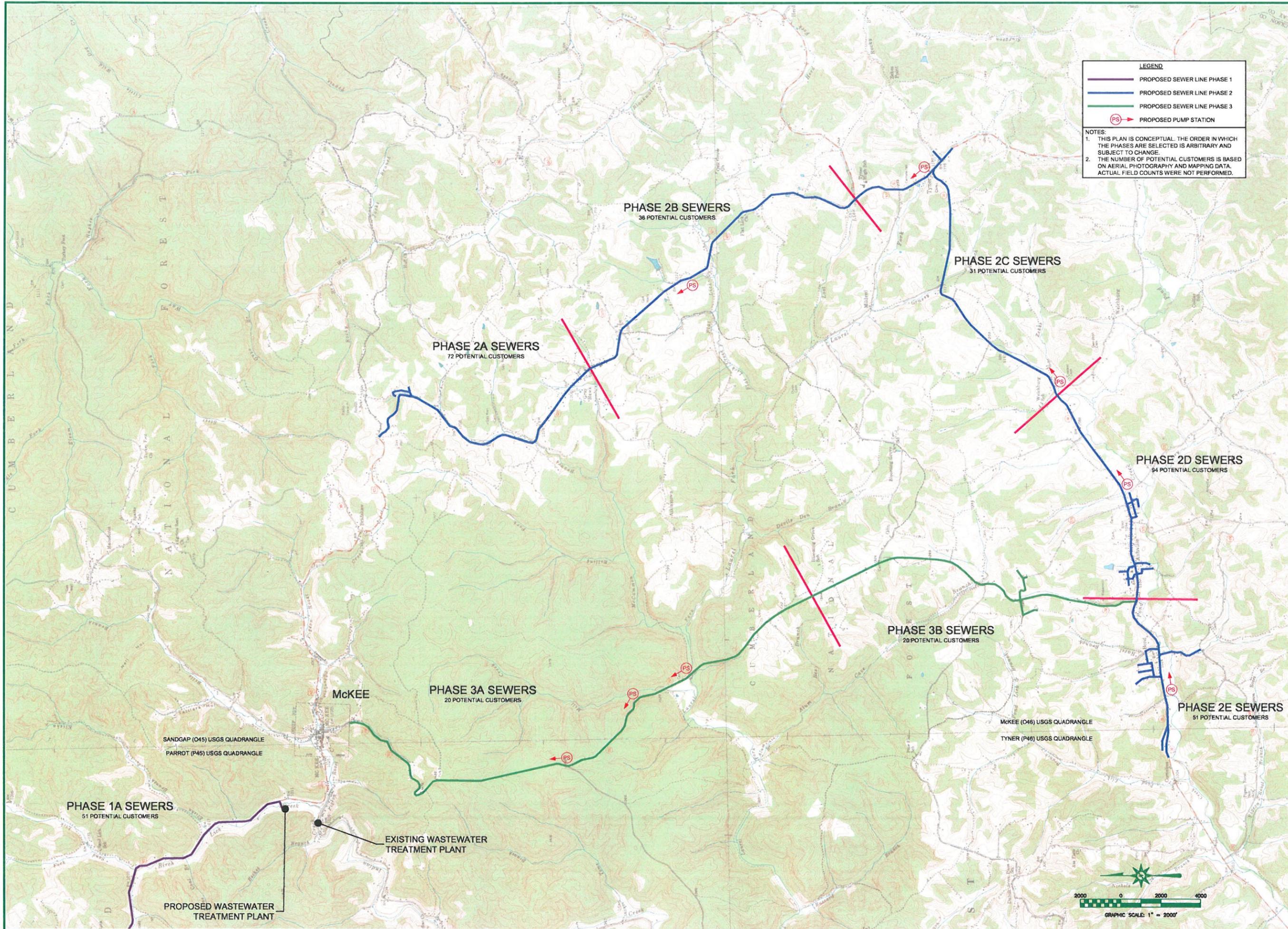
CITY OF McKEE, JACKSON COUNTY, KENTUCKY
REGIONAL FACILITY PLAN

Drawn by: BMC
Scale: 1" = 5000'
Job No.: 1098.10
File Name: \\Report\Section 3\DWG\FIGURES 3-1 AND 3-2.DWG
Sheet No.: 3-18-13

FIGURE 3-2



LAST PLOTTED: LAST SAVED:	
CITY OF McKEE JACKSON COUNTY, KENTUCKY REGIONAL FACILITY PLAN CUMBERLAND VALLEY AREA DEVELOPMENT DIST. USGS WITH SANITARY SEWER PHASES	
nesbitt engineering, inc. <small>providing proven solutions since 1976</small> CITY OF McKEE, JACKSON COUNTY, KENTUCKY REGIONAL FACILITY PLAN	JOB NO.: 1098.10 SCALE: 1" = 2000' DRAWN BY: JCW DATE: 2-18-13 FILE NAME: \\server\Section 3\DWG\FIGURES 3-3 AND 3-4.DWG
 GRAPHIC SCALE: 1" = 2000' 2000 0 2000 4000	
FIGURE 3-3	



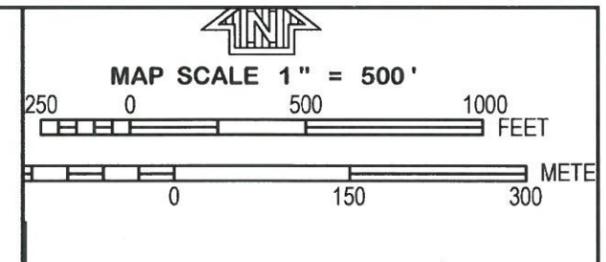
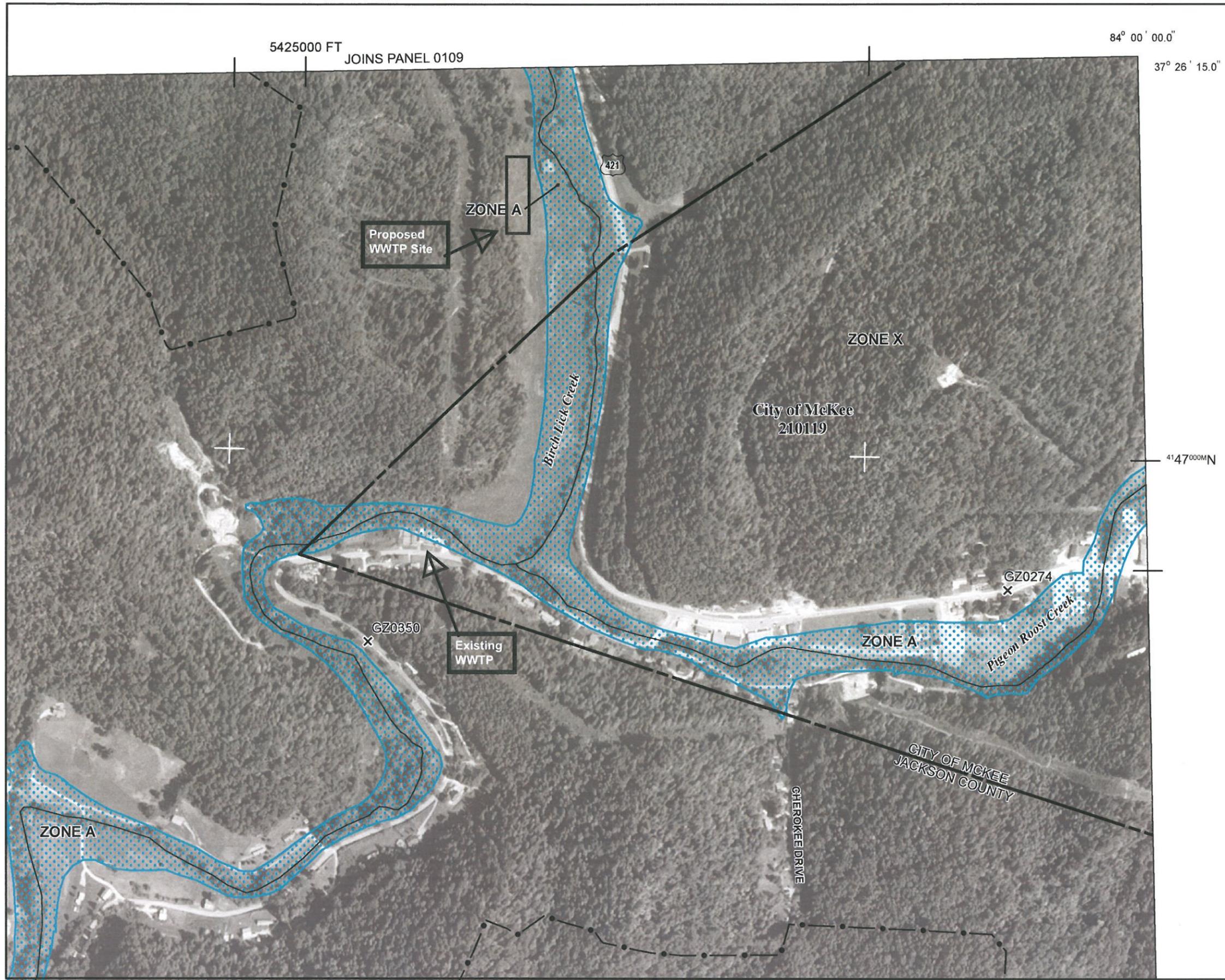
LEGEND

- PROPOSED SEWER LINE PHASE 1
- PROPOSED SEWER LINE PHASE 2
- PROPOSED SEWER LINE PHASE 3
- PROPOSED PUMP STATION

NOTES:

- THIS PLAN IS CONCEPTUAL. THE ORDER IN WHICH THE PHASES ARE SELECTED IS ARBITRARY AND SUBJECT TO CHANGE.
- THE NUMBER OF POTENTIAL CUSTOMERS IS BASED ON AERIAL PHOTOGRAPHY AND MAPPING DATA. ACTUAL FIELD COUNTS WERE NOT PERFORMED.

LAST PLOTTED: LAST SAVED:	
CITY OF MCKEE JACKSON COUNTY, KENTUCKY REGIONAL FACILITY PLAN CUMBERLAND VALLEY AREA DEVELOPMENT DIST. USGS WITH SANITARY SEWER PHASES	
nesbitt engineering, inc. <small>providing proven solutions since 1976</small> CITY OF MCKEE, JACKSON COUNTY, KENTUCKY REGIONAL FACILITY PLAN JOB NO.: 1098.10 DATE: 2-18-13 DRAWN BY: JCW FILE NAME: \\server\Section 3\DWG\FIGURES 3-3 AND 3-4.DWG	
<p>GRAPHIC SCALE: 1" = 2000'</p>	
FIGURE 3-4	



PANEL 0117C

FIRM
FLOOD INSURANCE RATE MAP
JACKSON COUNTY,
KENTUCKY
AND INCORPORATED AREAS

PANEL 117 OF 275
 (SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
JACKSON COUNTY	210118	0117	C
MCKEE, CITY OF	210119	0117	C

Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.


MAP NUMBER
21109C0117C
EFFECTIVE DATE
AUGUST 3, 2009

Federal Emergency Management Agency

Figure 3 - 5

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Section 4: Socioeconomic Characteristics of the Planning Area

1. Historical and Current Population

The entire Planning Area consists largely of small towns and rural communities. In the last 50 years, Jackson County has had periods of growth followed by stagnation. As Table 4-1 shows, Jackson Co. and the entire Cumberland Valley Area Development District (CVADD) has seen staggered to flat growth in population in the last ten years.

Table 4-1 summarizes data from the US Census Bureau.

Table 4-1
Historical Population Data, Kentucky, Cumberland Valley ADD & Jackson County

	1960	1970	1980	1990	2000	2010
Kentucky	3,038,156	3,236,121	3,665,364	3,692,550	4,041,769	4,339,367
avg. annual % increase in previous 10 yrs.		0.7%	1.3%	0.1%	0.9%	0.7%
Cumberland Valley ADD	206,176	185,908	228,184	223,053	238,270	236,618
avg. annual % increase in previous 10 yrs.		-1.0%	2.3%	-0.2%	0.7%	-0.1%
Jackson County	10,677	10,005	11,996	11,955	13,495	13,494
avg. annual % increase in previous 10 yrs.		-0.6%	2.0%	0.0%	1.3%	0.0%

2. Current and Projected Population

The Planning Area has numerous regions of steep slopes to mountain peaks that prohibit development in the region. Phase 1 serves McKee, and is located on a moderately trafficked road that connects Richmond/Berea to Manchester and passes through Sand Gap and McKee. Future phases are largely unsewered and are centered along US 421, Ky 290 and KY 30. KY 290 connects McKee to Annville. Ky 30, is a heavily trafficked road that connects London to Jackson, and passes through Annville. Most of the residential population in the Planning Area is located along these routes or in one of the small cities/towns.

Table 4-2 summarizes projected population data provided by the Kentucky State Data Center at the University of Louisville. The flat annual 0.0% increase in Jackson County population over the past 10 years is projected to more or less continue in the future.

Section 4: Socioeconomic Characteristics of the Planning Area

Table 4-2
Projected Population Data, Kentucky and Jackson County

	Census	Projections				
	2010	2015	2020	2025	2030	2035
Kentucky	4,339,367	4,509,429	4,672,754	4,820,390	4,951,178	5,063,331
total % increase since 2010		3.9%	7.7%	11.1%	14.1%	16.7%
avg. annual % increase since 2010		0.8%	0.8%	0.7%	0.7%	0.7%
Jackson County	13,494	13,690	13,771	13,709	13,538	13,251
total % increase since 2010		1.5%	2.1%	1.6%	0.3%	-1.8%
avg. annual % increase since 2010		0.3%	0.2%	0.1%	0.0%	-0.1%

3. Current and Projected Industrial and Commercial Users

The Planning Area is largely residential, with a few small industries, institutional and commercial facilities. There are no major industrial sites in the Planning Area and there are no current indications or known public plans for future industrial or commercial construction of any large magnitude. Therefore, for purposes of future flow projections, it is assumed industrial or commercial growth will be proportional to residential growth.

One possible exception is the new Hwy 30E which connects Annville to London. This greatly improved highway has the potential to spur commercial and industrial growth in the area.

4. Economic and Social Impact

The impact of constructing a regional WWTP and extending sewers as proposed in this Plan is largely for environmental protection. However, improvements to water quality and sanitation can have a positive impact on social conditions, improving the desirability of the area, thus encouraging residential growth and the boost to the local economy that comes with it. This may be particularly significant in the Annville region near Hwy 30E.

Furthermore, the addition of public sewer has a tendency to increase property values, particularly when replacing failing septic systems.

Section 5: Existing Environment in the Planning Area

1. Physical Features

A. Surface Water Features and Quality

The project area is located within the Middle Fork Rockcastle River watershed of the Upper Cumberland River Basin. The Upper Cumberland River drains approximately 5,184 square miles of eastern Kentucky. This area includes all or part of 17 counties. There are approximately 6,420 miles of streams and rivers in the Upper Cumberland basin. Streams in this basin have documented impairments due to industrial and municipal wastewater discharges, agricultural impacts, urban runoff and development, and other unknown sources. Many wells and surface waters in the Upper Cumberland are contaminated from untreated human sewage from failing septic systems and straight pipe discharges.

The Section 303(d) list of impaired waters contained in the 2010 Integrated Report to Congress on the Condition of Water Resources in Kentucky was accessed to determine if there are any impaired waterbodies in the vicinity of the project area. Section 303(d) is a part of the Clean Water Act and requires States to develop a list of waters not meeting water quality standards or which have impaired uses. These waters are identified as being impaired for one or more pollutants and do not meet one or more water quality standards. Impaired waters are identified through assessment and monitoring programs conducted by KDOW personnel, volunteer networks and other local, state and federal agencies. Causes of impairment include pathogens, siltation, flow alteration, turbidity, suspended solids, and low dissolved oxygen. The list contained in the 2010 report indicated that there are two impaired water bodies in the Upper Cumberland River Basin in Jackson County, which are listed as the following:

- Indian Creek (0.0 to 4.5)
 - Impaired Use: Warm Water Aquatic Habitat (Partial Support)
 - Pollutant: Sedimentation/Siltation
 - Suspected Sources: Loss of Riparian Habitat

- Pond Creek (0.0 to 6.3)
 - Impaired Use: Warm Water Aquatic Habitat (Partial Support)
 - Pollutant: Nutrient/Eutrophication Biological Indicators; Organic Enrichment (Sewage) Biological Indicators; Dissolved Oxygen
 - Suspected Sources: Agriculture; Loss of Riparian Habitat; Municipal Point Source Discharges

Total Maximum Daily Loads (TMDL) have not yet been developed for these streams.

B. Groundwater Quality

Groundwater flow in this region is predominantly through cracks in the rocks, with wells in valleys typically producing more water than wells on ridges. The water quality in the proposed project area is poor due to contamination by raw sewage discharge and

Section 5: Existing Environment in the Planning Area

malfunctioning or overflowing septic tanks. According to the Kentucky Geological Survey (KGS) Information Circular No. 44 dated 1993, and titled "*Quality of Private Ground-Water Supplies in Kentucky*," a study was conducted to determine the quality of ground water in the State. In Jackson County, 20 ground water wells were tested and these wells yielded above-average results in nitrate (140% of the regional average) and nitrite (300% of the regional average).

C. Water Sources and Supply

The majority of households in the Upper Cumberland basin are not connected to municipal wastewater treatment systems and therefore rely on some form of onsite treatment for wastewater. Few municipal wastewater treatment systems presently exist except in some of the larger communities. According to the "*Cumberland River Basin and Four Rivers Region Status Report*", by the Kentucky Division of Water (March 2000), the primary onsite treatment system for households in the Upper Cumberland basin is a septic tank to remove solid material and a leach field to dispose of the wastewater. However, numerous households in this basin do not have any form of wastewater treatment, and the untreated wastewater from these households is discharged directly to a creek or onto the ground ("straight-pipe" discharge).

D. Wetlands

The USACE was contacted regarding the possibility of wetlands within or adjacent to the project area. A response was received from Mr. Marty G. Tyree, Project Manager with the USACE. Mr. Tyree indicated that a survey for the presence of streams and wetlands should be conducted where potential work would occur. A review of the site was conducted by Ms. Debbie Collinsworth of EcoSource, Inc. and she concluded that two ephemeral streams are located at the site; however, Ms. Collinsworth indicated that these streams should be classified as isolated waters. A preliminary Jurisdictional Determination (JD) was issued by the USACE on August 18, 2009, stating that Birch Lick Creek is considered waters of the U.S. and is therefore jurisdictional; however, the USACE concurred with Ms. Collinsworth stating that the two ephemeral streams at the project site are upland drainage features and are not considered waters of the U.S. Construction will not occur in Birch Lick Creek and therefore jurisdictional waters will not be altered by the proposed project. The project is covered by a 2007 Nationwide Permit issued by the USACE Louisville District (Nationwide Permit #14 – Linear Transportation Projects). The conditions of this permit as issued by the USACE and the accompanying Water Quality Certification with special conditions issued by the KDOW must be followed; therefore, an Individual Permit would not be required for this proposed project.