

Report

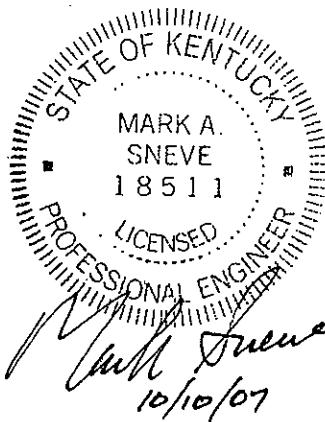
**Hardin County
Regional
Wastewater
Facilities Plan**

**Hardin County
Water District
No. 2, KY**

October 2007

Report for
**Hardin County Water
District No. 2**

Hardin County Regional
Wastewater Facilities Plan



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SECTION 1
EXECUTIVE SUMMARY

1.01 INTRODUCTION AND BACKGROUND

Hardin County Water District No. 2 retained Strand Associates, Inc.[®] to complete a Regional Wastewater Facility Plan to evaluate their current wastewater conveyance and treatment needs for a 20-year planning period ending in 2027 for areas of the county not currently included in a Regional Wastewater Facility Plan.

1.02 EXISTING ENVIRONMENT

Many areas within Hardin County that do not currently reside within a wastewater planning area have experienced strong population growth since 1990 and are anticipated to continue growing. Most of the areas that have experienced strong population growth are served by on-site wastewater treatment systems such as septic tanks and lateral fields. Many of these systems are failing due to the karst topography, clayey soils, and shallow bedrock that are typical throughout the county. If development continues under these conditions, there will be undesirable impacts on both the environment and public health. Hardin County also has one area within the county wastewater planning area that is anticipated to experience industrial development within the next 20 years. At present, no significant industry is located within the Hardin County Wastewater Planning Area.

1.03 EXISTING WASTEWATER COLLECTION AND CONVEYANCE

There are currently six wastewater planning areas that exist in Hardin County. The West Point, Vine Grove, Fort Knox, Radcliff, Elizabethtown, and Caveland Environmental Authority planning areas have been established by the Kentucky Division of Water. The existing collection and conveyance systems are composed of both gravity sewers and pump stations/force mains. Through conversations with the municipalities, their collections systems either have the capacity to accept county wastewater or may require an upgrade to do so. There are no existing collection and conveyance systems outside these existing planning areas. Most residents outside these existing planning areas still continue to rely upon on-site wastewater treatment systems. Based on conversations with the Hardin County Health Department, some of these systems have failed or are failing, making it difficult to continue utilizing this alternative.

1.04 EXISTING WASTEWATER TREATMENT FACILITIES

There are a total of five municipal WWTPs and 11 private or ‘package’ WWTPs within Hardin County. The Elizabethtown, Vine Grove, Radcliff, Fort Knox, and Caveland Environmental Authority municipal WWTPs were examined for capacity and utilized in the development of alternatives to accept county wastewater. The West Point WWTP was not considered in any county alternatives. Table 1.04-1 illustrates the rated capacity and the average flow at the municipal treatment plants as of 2003.

WWTP Name	Type	Rated Capacity (mgd)	Average Flow April 2002 through March 2003 (mgd)	Percent of Capacity
Elizabethtown	Municipal	7.2	6.18	86
Fort Knox	Municipal	6.0	2.0	33
Radcliff	Municipal	4.0	2.34	59
Vine Grove	Municipal	0.714	0.30	41
Caveland Environmental Authority-Horse Cave	Municipal	0.28	0.15	54

Table 1.04-1 Rated Capacity/Average Flow at Existing Wastewater Treatment Facilities

The Elizabethtown, Fort Knox, Radcliff, Vine Grove, and Caveland Environmental Authority-Horse Cave WWTPs all utilize an extended aeration activated sludge (oxidation ditch) process to treat wastewater. The Fort Knox, Radcliff, and Elizabethtown WWTPs dispose of solids by hauling to landfills, and the Vine Grove WWTP disposes of liquid sludge by applying it at a city-owned land farm adjacent to the plant.

1.05 WASTELOAD AND FLOW FORECASTS

The planning area was developed to include areas of the county not already in an existing wastewater planning area or in a planning area anticipated to be revised. For the purposes of this facilities plan, the anticipated wasteloads are typical of domestic strength wastewater. Any industrial users would be expected to pretreat their wastewater to domestic strength, unless other arrangements are accepted when they construct. The flow forecasts were developed by

Wastewater Flows	Unit	By Year 2017	By Year 2027
Northern Service Area			
Average Daily Flow	mgd	1,016	1,924
Peak Hourly Flow	gpm	2,080	3,570
Southern Service Area⁽¹⁾			
Average Daily Flow	mgd	2,553	2,875
Peak Hourly Flow	gpm	4,520	4,980
Eastern Service Area			
Average Daily Flow	mgd	0.116	0.377
Peak Hourly Flow	gpm	300	880
Upton and Sonora Service Area			
Average Daily Flow	mgd	0.092	0.105
Peak Hourly Flow	gpm	240	280
Total County Average Daily Flow	mgd	3.78	5.28

(1) Includes Industrial Tract

Table 1.05-1 Projected Wastewater Flows

analyzing existing and projected population data from both the Kentucky State Data Center and the Lincoln Trail Area Development District. Flows were divided among five service areas throughout the county to be conveyed to three potential new county WWTPs. After discussions with the Kentucky Division of Water, only two of these county WWTPs (a northern and southern plant) were permitted wasteload allocations. The Valley Creek Service Area has been included in the revised Elizabethtown planning area and therefore excluded in the flow forecasts. Table 1.05-1 illustrates the anticipated flows from the four remaining service areas in the county.

1.06 CONVEYANCE AND TREATMENT ALTERNATIVES

During the development of this wastewater facilities plan, 74 collection and conveyance alternatives were developed for 32 separate subwatersheds in Hardin County. Since the initiation of this facilities plan, the City of Elizabethtown has expanded their planning area to include 10 entire subwatersheds and portions of three other subwatersheds. The developed alternatives included collecting and conveying wastewater to either an existing municipal WWTP or potentially a new county WWTP. The preliminary sizes of collector sewers, pump stations, and force mains were developed for each of the alternatives. Cost information was developed by contacting contractors and obtaining representative unit prices for infrastructure, as well as analyzing costs spent on other collection systems and wastewater treatment plants. Nonmonetary factors were also developed and considered for the collection and conveyance of each watershed. In general, the selected alternatives were the alternatives that provided conveyance and treatment to an existing municipal WWTP. A detailed analysis of each alternative for each watershed is illustrated in Section 7 of this report.

1.07 WASTEWATER TREATMENT ALTERNATIVES

In general, two types of wastewater treatment were evaluated for each subwatershed; one being municipal treatment by an existing WWTP, the other being treatment at a new county WWTP. Five municipal WWTPs were considered for municipal treatment; Fort Knox, Radcliff, Vine Grove, Elizabethtown, and Caveland WWTP. Strand Associates inquired about any upgrades and costs necessary for these municipal WWTPs to accept additional flow outside of their planning area. For the proposed county WWTPs, design criteria and costs were developed for an extended aeration, activated sludge WWTP. Nonmonetary factors were also considered in evaluating the wastewater treatment alternatives. The proposed county WWTPs were evaluated to be designed for the 0- to 10-year flow projections, and upgraded in the future to accept the 10- to 20-year flow projections. Table 1.07-1 summarizes the costs developed for the county WWTPs. Table 1.07-2 gives a more detailed approach.

	Otter Creek WWTP (to Serve Northern County Service Areas)		Nolin River WWTP (to Serve Southern County Service Areas)	
	Initial (1 MGD)	Expand to (2 MGD)	Initial (2 MGD)	Expand to (3 MGD)
		\$5,109,000	\$2,469,000	\$7,437,000
Cost per gpd capacity	\$5.00	\$2.00	\$4.00	\$3.00
Ultimate Capacity cost per gpd		\$4.00		\$3.00

Does not include General Conditions, Contingencies, and Technical Services as they are added in the cost spreadsheets.

Table 1.07-1 Summary of County WWTP Costs and Design Criteria

TABLE 1.07-2

COUNTY WWTP COSTS AND DESIGN CRITERIA

Item	Otter Creek		Nolin River		
	Initial 1 MGD	Expand to 2 MGD	Initial 2 MGD	Expand to 3 MGD	
Influent Pumping	\$300,000	\$50,000	\$350,000	\$75,000	
Screening	\$215,000	\$100,000	\$310,000	\$100,000	
Grit Removal	\$270,000	\$0	\$325,000	\$0	
Oxidation Ditch	\$900,000	\$900,000	\$1,700,000	\$850,000	
Final Clarifiers	\$540,000	\$270,000	\$680,000	\$340,000	
RAS/WAS/S Pumping	\$200,000	\$75,000	\$300,000	\$80,000	
UV Disinfection	\$225,000	\$75,000	\$300,000	\$75,000	
Post aeration, Sampling, Metering	\$50,000	\$20,000	\$60,000	\$30,000	
Sludge Handling	\$525,000	\$200,000	\$725,000	\$200,000	
Subtotal	\$3,225,000	\$1,690,000	\$4,750,000	\$1,750,000	
Site Work	5%	\$161,000	\$85,000	\$238,000	\$88,000
Piping	15%	\$484,000	\$254,000	\$713,000	\$263,000
Electrical & Controls	20%	\$645,000	\$338,000	\$950,000	\$350,000
HVAC & Plumbing	3%	\$97,000	\$51,000	\$143,000	\$53,000
Misc metals	2%	\$65,000	\$34,000	\$95,000	\$35,000
Painting	1%	\$32,000	\$17,000	\$48,000	\$18,000
Subtotal		\$4,709,000	\$2,469,000	\$6,937,000	\$2,557,000
Admin/Lab Building		\$200,000	\$0	\$250,000	\$0
Land		\$200,000	\$0	\$250,000	\$0
TOTAL		\$5,109,000	\$2,469,000	\$7,437,000	\$2,557,000
Cost per gpd capacity		\$5	\$2	\$4	\$3
Ultimate Capacity cost per gpd			\$4		\$3

Does not include General Conditions, Contingencies, and Technical Services as they are added in cost spreadsheets.

Table 1.07-3 illustrates the required upgrades and wastewater treatment costs for the municipal entities.

Utility	Terminal Force Main Location	Costs to County	Special Conditions	Volume Charge/1,000 gal
Fort Knox	Wilson Road gate or Bullion Blvd. Gate	Share in cost to upsize lines	Subject to PSC approval	\$2.00
Radcliff	WWTP	New WWTP Headworks	Capacity Charge \$1,000/customer	\$4.10
Vine Grove	WWTP	Build WWTP Capacity		\$5.00
Elizabethtown	Varies by area		Capacity charge \$1,500/customer for conveyance; \$500/customer for WWTP	\$3.35 (soon)
Caveland	Bonnieville PS	Provide equalization to limit PHF to 180 gpm		\$4.54

Table 1.07-3 Municipal WWTP Upgrades and Volume Charge

1.08 RECOMMENDED PLAN

The evaluation of the Hardin County collection and conveyance systems included the assessment of 74 conveyance and treatment alternatives in 31 subwatersheds. Since the initiation of this facilities plan, the City of Elizabethtown has expanded their planning area to include 10 entire watersheds and portions of three others. The alternatives were considered based on topography and relative location of existing WWTPs. Cost opinions of alternatives were developed for each subwatershed and nonmonetary factors were considered when the economic evaluation showed that any alternatives were within 10 percent. All capital cost opinions are shown in 2007 dollars, and the capital cost opinion during 10 to 20 years is the incremental cost to develop additional infrastructure during the 10- to 20-year planning horizon. The recommended alternatives are established based on the four service areas within the Hardin County planning area.

A. Northern Service Area

Alternatives for the Northern Service Area were developed based on 0- to 10-year and 10- to 20-year projected wastewater needs. The Northern Service Area includes the Brushy Fork Creek (0 to 10 year and 10 to 20 year), Mill Creek Branch, (0 to 10 year), Mill Creek (10 to 20 year), Pawley Creek and Otter Creek (0 to 10 year and 10 to 20 year), and Flippin Creek (10 to 20 year) subwatersheds. These subwatersheds were evaluated to either be served by an existing municipal WWTP or a new Otter Creek WWTP. Table 1.08-1 illustrates the recommended plan for the Northern Service Area. Figures 1.08-1 and 1.08-2 show the recommended infrastructure for this service area by 2017 and 2027, respectively

TABLE 1.08-1

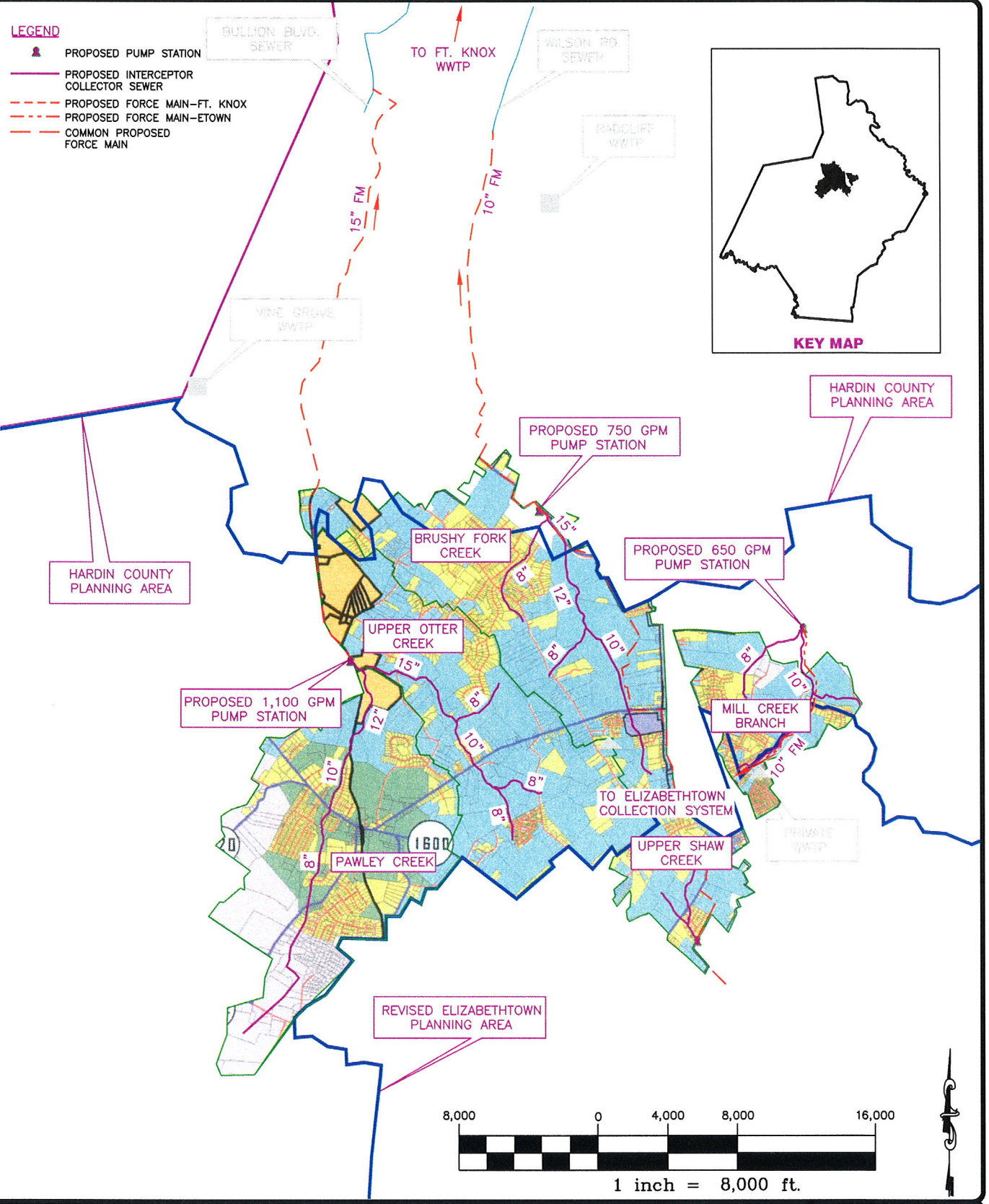
NORTHERN SERVICE AREA RECOMMENDED PLAN

Subwatershed	Area of Concern	Wastewater Flow (mgd)			Recommended Plan	Capital Cost Opinion ⁽¹⁾ (0 to 10 year)	Capital Cost Opinion ⁽¹⁾ (10 to 20 year)
		2003	2017	2027			
Brushy Fork Creek	Burns-Deckard School Road Area	0.22	0.31	0.43	Collect wastewater through 8,10,12, and 15-inch trunk sewers to a regional 750 gpm pump station with 10-inch force main to the Wilson Road sewer for treatment at the Ft. Knox WWTP in the 0-10 year planning horizon. Utilize existing infrastructure and upgrade pump station to a 1,000 gpm pump station in the 10-20 year planning horizon.	\$5,866,000	\$117,000
Pawley Creek and Otter Creek	LaVista Estates, Boone Road area, and Rineyville	0.43	0.47	0.96	Collect wastewater through 8,10,12, and 15-inch trunk sewers, to a regional 1,100 gpm pump station with 15-inch force main to the Bullion Blvd. sewer for treatment at the Ft. Knox WWTP in the 0-10 year planning horizon. In the 10-20 year planning horizon, abandon the existing pump station and utilize existing trunk sewers, and construct additional 8,10, 18 and 21-inch trunk sewers to flow by gravity to a 1,700 gpm regional pump station at the location of the proposed Otter Creek WWTP. Utilize the existing 15-inch force main to the Bullion Blvd. sewer for treatment at the Ft. Knox WWTP.	\$8,204,000	\$5,916,000
Mill Creek Branch	Airview Estates	0.20	0.23	0.27	Collect wastewater through 8 and 10-inch trunk sewers to a regional 650 gpm pump station with a 10-inch force main to the Elizabethtown collection system for treatment at the Elizabethtown WWTP in the 0-10 year planning horizon. In the 10-	\$5,220,000	\$855,000

Subwatershed	Area of Concern	Wastewater Flow (mgd)			Recommended Plan	Capital Cost Opinion ⁽¹⁾ (0 to 10 year)	Capital Cost Opinion ⁽¹⁾ (10 to 20 year)
		2003	2017	2027			
					20 year planning horizon, utilize the existing trunk sewers and construct new 8 and 10-inch trunk sewers. Upgrade the pump station capacity to 1,100 gpm and utilize existing force main to the Elizabethtown collection system for treatment at the Elizabethtown WWTP.		
Mill Creek		0.11	0.14	0.17	Collect wastewater through 8 and 12-inch trunk sewers to a regional 450 gpm pump station with a 6-inch force main to the 1,100 gpm Mill Creek Branch pump station. The existing 10-inch force main to the Elizabethtown collection system will be utilized and treatment will be provided at the Elizabethtown WWTP.	N/A	\$1,838,000
Flippin Creek		0.03	0.07	0.11	Collect wastewater through 8-inch trunk sewer to the regional 1,700 gpm pump station at the location of the proposed Otter Creek WWTP. Utilize the existing 15-inch force main to the Bullion Blvd. Sewer with treatment at the Fort Knox WWTP.	N/A	\$1,304,000
Total		1.00	1.22	1.92		\$19,290,000	\$10,030,000

⁽¹⁾ All capital costs include trunk sewers, pump stations, force mains, and WWTPs, but exclude the collector sewers.

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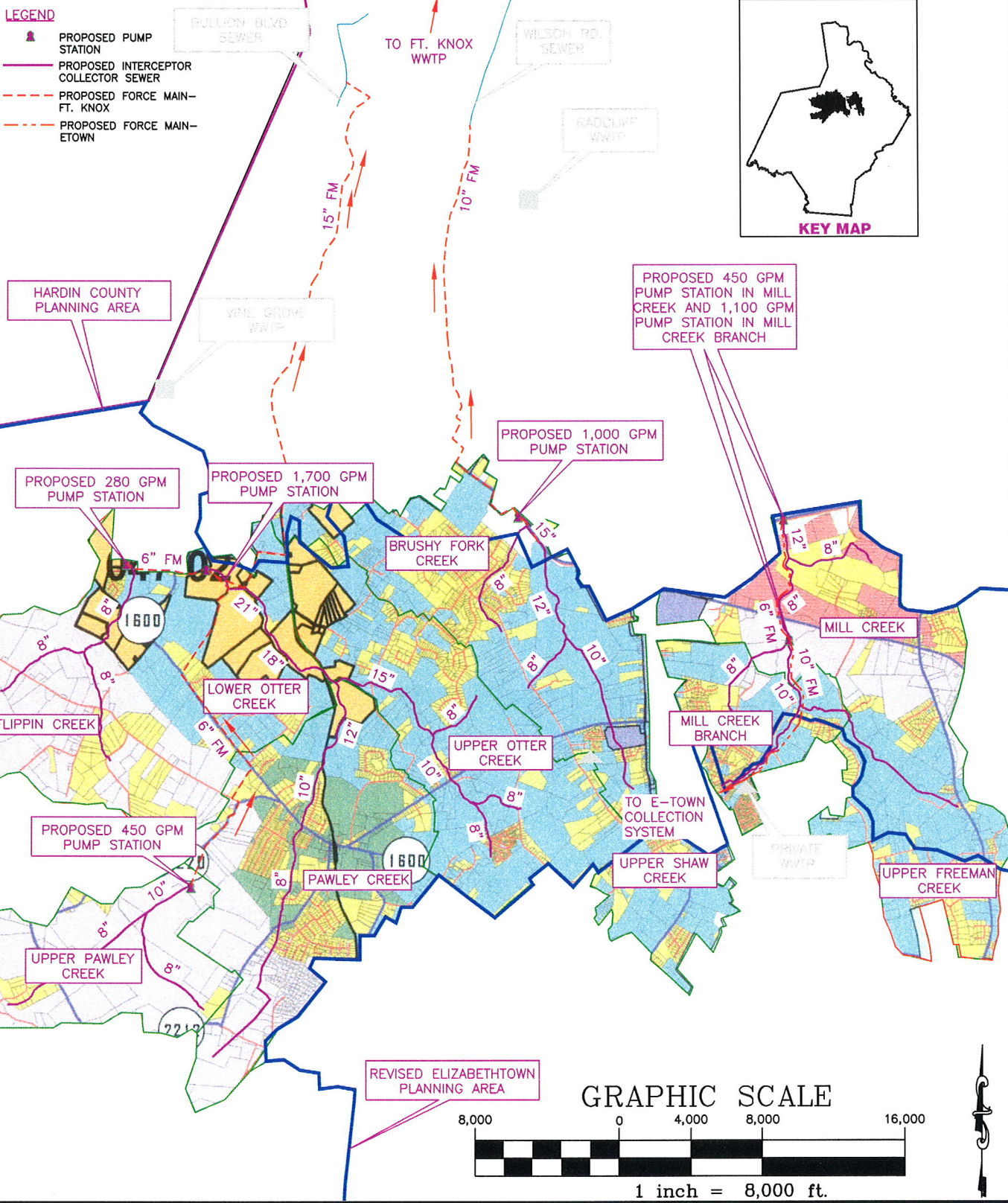
**DESIGN YEAR 2017 - NORTHERN SERVICE AREAS
RECOMMENDED PLAN**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 1.08-1
JOB NO. 5-980-001

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**DESIGN YEAR 2027 - NORTHERN SERVICE AREAS
RECOMMENDED PLAN**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 1.08-2
JOB NO. 5-980-001

B. Southern Service Area

Alternatives for the Southern Service Area were developed based on 0- to 10-year and 10- to 20-year projected wastewater needs. The Southern Service Area includes the North Upper Nolin River (0 to 10 year and 10 to 20 year), Rose Run (0 to 10 year and 10 to 20 year), Cox Run (10 to 20 year), Jackson Branch (10 to 20 year), Nolin River (10 to 20 year), Upper West Rhudes (10 to 20 year), and Lower Valley Creek (10 to 20 year) subwatersheds. These subwatersheds were evaluated to either be served by an existing municipal WWTP or a new county-owned Nolin River WWTP. Table 1.08-2 illustrates the plan alternatives for the Southern Service Area. The recommended infrastructure for this service area is shown on Figure 1.08-3 for year 2017 and on Figure 1.08-4 for year 2027.

C. Eastern Service Area

Alternatives for the Eastern Service Area were developed based on 0 to 10 year and 10 to 20 year projected wastewater needs. The Eastern Service Area includes the Upper Younger Creek (0-10 year), Clear Creek (10 to 20 year), and Cedar Creek (10 to 20 year) watersheds. These watersheds were evaluated to either be served by the Elizabethtown WWTP or served by a new county-owned Younger Creek WWTP. A wasteload allocation was not provided by KDOW for the Younger Creek WWTP; therefore, it is recommended that the Eastern Service area watersheds construct infrastructure to convey wastewater to the existing Elizabethtown collection system for treatment by the Elizabethtown WWTP. Table 1.08-3 illustrates the recommended plan for each subwatershed and the capital cost opinion to develop that alternative. Figures 1.08-5 and 1.08-6 show the recommended infrastructure for this service area in the 0- to -10-year horizon and 11- to 20-year horizon, respectively.

D. Upton and Sonora Service Area

The Upton and Sonora Service Area, which includes the Dorsey Run and Sandy Creek Sub watersheds, was evaluated to be served by the Elizabethtown WWTP, Caveland WWTP, or a New Nolin River WWTP. The Dorsey Run and Sandy Creek Subwatersheds were assumed to reach the maximum projected population during the 0- to 10-year planning horizon. Table 1.08-4 illustrates the recommended plan for the subwatersheds and the capital cost opinion to develop that alternative. Figures 1.08-7 shows the recommended infrastructure for this service area in the 0- to -10-year horizon.

E. Rural Watersheds

The rural watersheds will be served by continued use of on-site treatment/disposal systems. In the event any subdivisions are planned, the developer will be expected to construct a cluster-type collection and treatment system for long-term management, operation and maintenance by HCWD1 or HCWD2. The cost of the construction will be borne by the developer and the OM&R costs will be funded by user rates.

TABLE 1.08-2

SOUTHERN SERVICE AREA RECOMMENDED PLAN

Subwatershed	Area of Concern	Wastewater Flow (mgd)			Recommended Plan	Capital Cost Opinion ⁽¹⁾ (0 to 10 Year)	Capital Cost Opinion ⁽¹⁾ (10 to 20 Year)
		2003	2017	2027			
Rose Run	Glendale	0.05	0.08	-	Collect wastewater through 8-inch trunk sewer to a regional 200 gpm pump station with a 6-inch force main to the Elizabethtown WWTP.	\$2,446,000	N/A
Rose Run, Lower Valley Creek, Upper West Rhudes Creek (partial)	Glendale	0.71	-	0.23	Collect wastewater through existing 8-inch trunk sewer and construct additional 8, 10, and 12-inch trunk sewers. The existing 200 gpm pump station will be abandoned and wastewater will flow by gravity to a new 350 gpm pump station with a 6-inch force main to the Elizabethtown WWTP. Trunk sewers in the Upper West Rhudes Creek will flow in the Elizabethtown collection system for treatment at the Elizabethtown WWTP.	N/A	\$3,613,000
North Upper Nolin River	Gilead Church-Glendale Road Area, Glendale Industrial Tract	0.02	2.48		Collect wastewater through 10 and 15-inch trunk sewers to regional 4,500 gpm pump stations with 18-inch force main to the Elizabethtown WWTP.	\$16,043,000	N/A
Nolin River, Cox Run, Jackson Branch	Gilead Church-Glendale Road Area, Glendale Industrial Tract	0.10	-	2.61	Utilize existing 10- and 15-inch trunk sewers with 4,500 gpm pump stations for the Glendale Industrial tract. Construct additional 8, 10, 15, 18, 21, and 24-inch trunk sewers with gravity flow to a new 1,200 gpm pump station at the location of the proposed Nolin River WWTP. Construct a 12-inch force main to the Elizabethtown WWTP.	N/A	\$7,102,000
Total		0.88	2.56	2.84		\$18,489,000	\$10,715,000

⁽¹⁾ All capital costs include trunk sewers, pump stations, force mains, and WWTPs, but exclude the collector sewers.

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LEGEND

- ▲ PROPOSED PUMP STATION
- PROPOSED INTERCEPTOR COLLECTOR SEWER
- PROPOSED FORCE MAIN-ETOWN
- COMMON PROPOSED FORCE MAIN

FUTURE GRAVITY SERVICE INTO ELIZABETHTOWN

REVISED ELIZABETHTOWN PLANNING AREA

WEST RHODES CREEK

EXISTING E-DOWN W/TP

EAST RHODES CREEK

MIDDLE CREEK BRANCH

PROPOSED 200 GPM PUMP STATION

6" + 18" FM

18" FM

15"

15"

10"

8"

8"

15"

15"

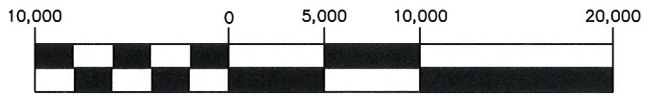
10"

PROPOSED 4,500 GPM PUMP STATIONS



KEY MAP

GRAPHIC SCALE



1 inch = 10,000 ft.

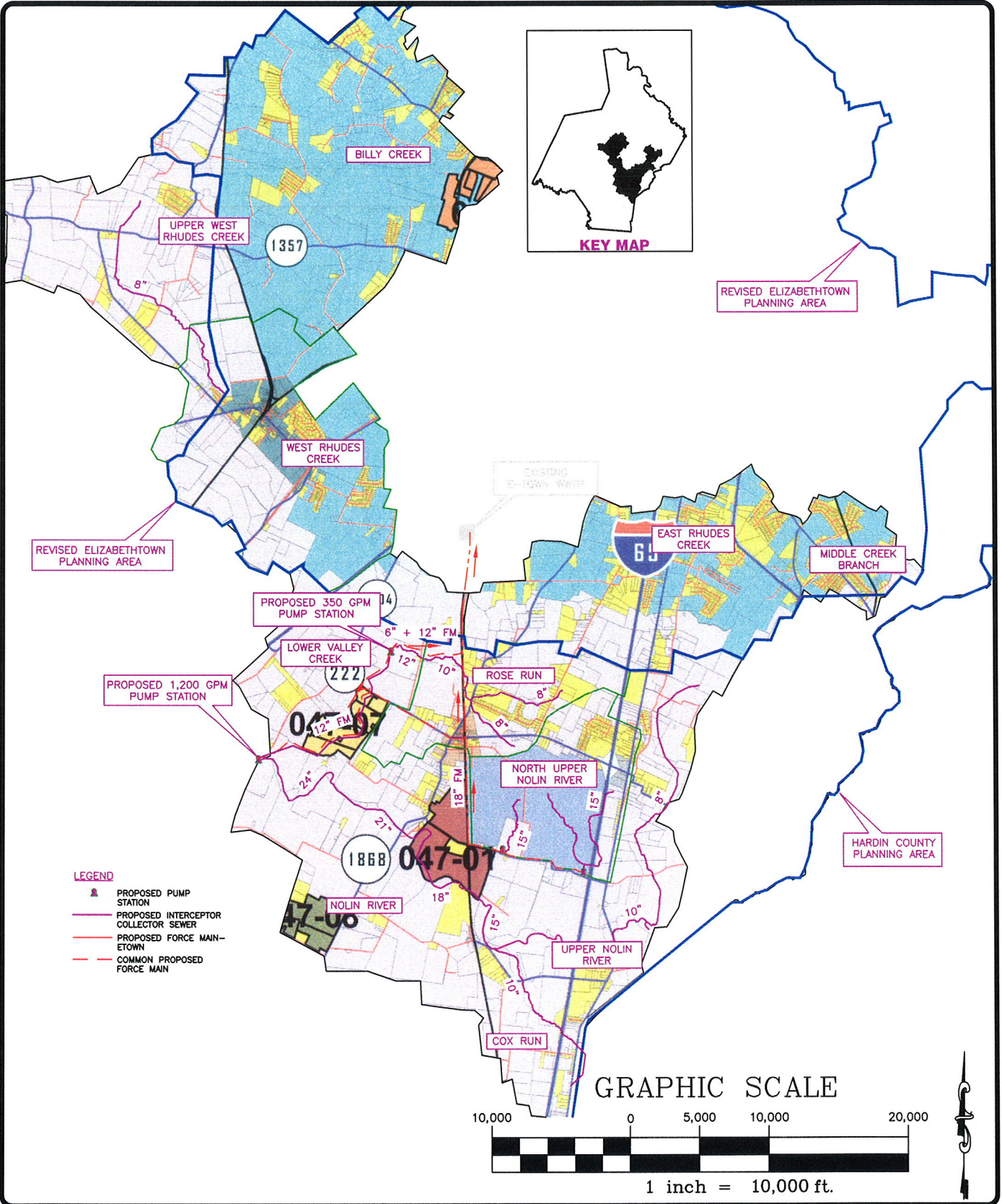
**DESIGN YEAR 2017 - SOUTHERN SERVICE AREAS
RECOMMENDED PLAN**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 1.08-3
JOB NO. 5-980-001

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- LEGEND**
- PROPOSED PUMP STATION
 - PROPOSED INTERCEPTOR COLLECTOR SEWER
 - PROPOSED FORCE MAIN - ETOWN
 - COMMON PROPOSED FORCE MAIN

**DESIGN YEAR 2027 - SOUTHERN SERVICE AREAS
RECOMMENDED PLAN**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 1.08-4
JOB NO. 5-980-001

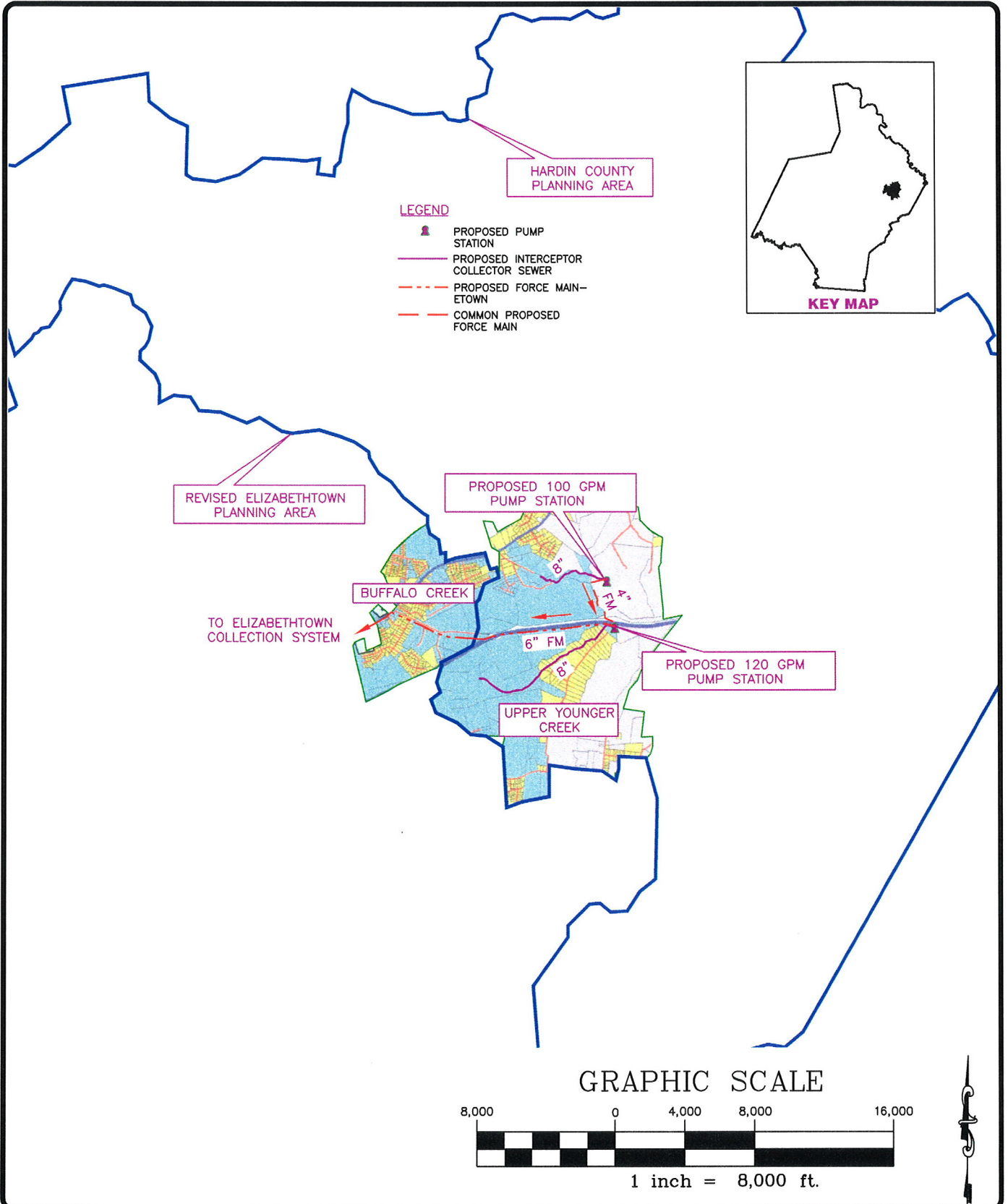
TABLE 1.08-3

EASTERN SERVICE AREA RECOMMENDED PLAN

Subwatershed	Area of Concern	Wastewater Flow (mgd)			Recommended Plan	Capital Cost Opinion ⁽¹⁾ (0 to 10 Year)	Capital Cost Opinion ⁽¹⁾ (10 to 20 Year)
		2003	2017	2027			
Upper Younger Creek	Springfield Road Area	0.08	0.12	0.16	In the 0-10 year planning horizon, collect wastewater through 8-inch trunk sewer to a 100 gpm and 120 gpm pump station. Construct a 4 and 6-inch force main and pump to the Elizabethtown collection system for treatment at the Elizabethtown WWTP. In the 10-20 year planning horizon, utilize existing 8-inch and construct additional 8 and 10-inch trunk sewers; abandon existing 100 and 120 gpm pump stations and flow by gravity to a new 400 gpm pump station. Utilize existing 6-inch force main into the Elizabethtown collection system for treatment at the Elizabethtown WWTP.	\$5,281,000	\$1,034,000
Cedar Creek		0.04	0.04	0.05	Collect wastewater through 8-inch trunk sewer to a regional 140 gpm pump station with 6-inch force main and pump to Elizabethtown collection system for treatment at the Elizabethtown WWTP	N/A	\$1,545,000
Clear Creek		0.10	0.13	0.17	Collect wastewater through 8-inch trunk sewer, to regional 430 gpm pump station with 8-inch force main and pump to Elizabethtown collection system for treatment at the Elizabethtown WWTP	N/A	\$3,196,000
Total		0.22	0.29	0.38		\$5,281,000	\$5,775,000

⁽¹⁾ All capital costs include trunk sewers, pump stations, force mains, and WWTPs, but exclude the collector sewers.

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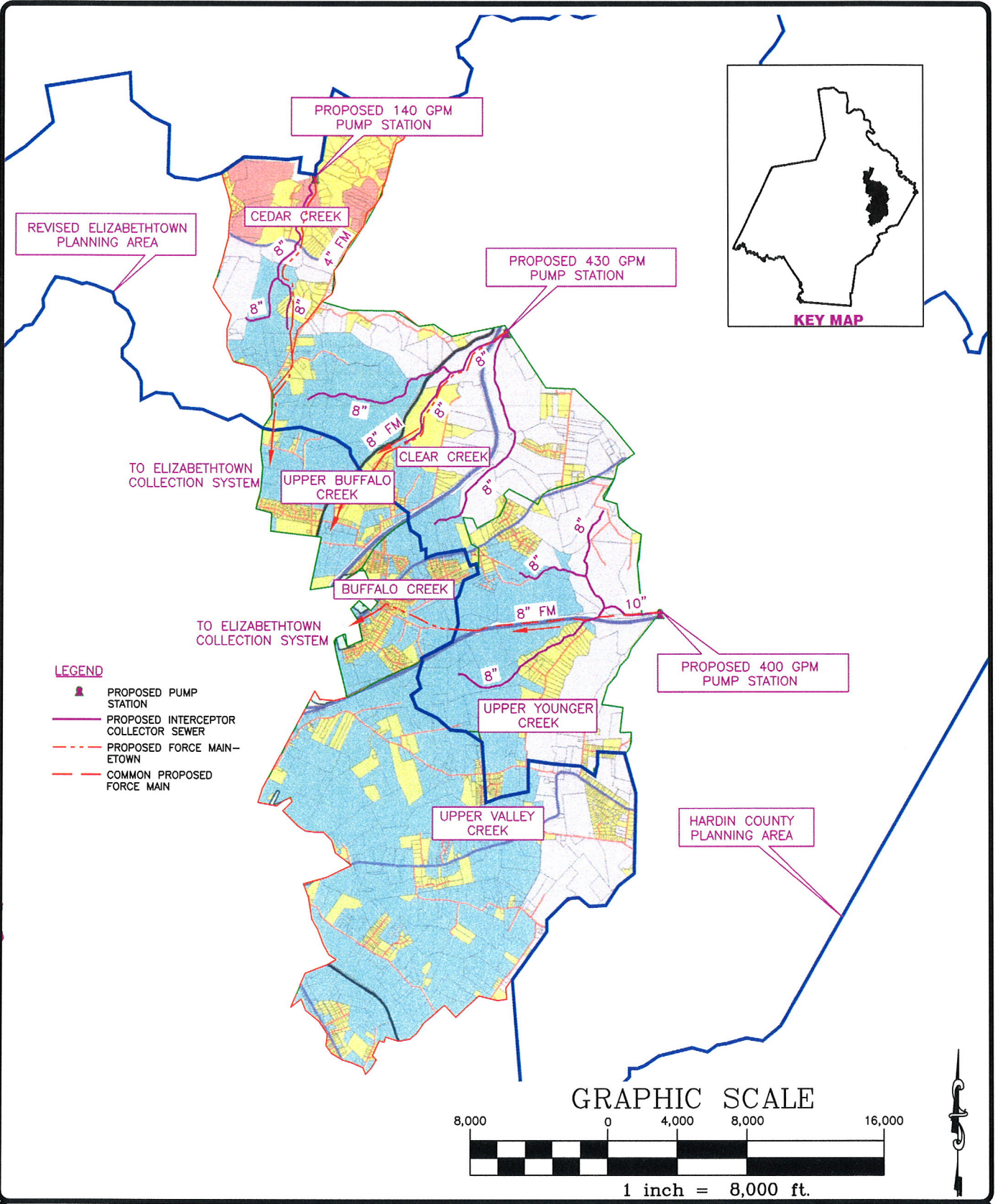
**DESIGN YEAR 2017 - EASTERN SERVICE AREAS
RECOMMENDED PLAN**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 1.08-5
JOB NO. 5-980-001

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**DESIGN YEAR 2027 - EASTERN SERVICE AREAS
RECOMMENDED PLAN**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 1.08-6
JOB NO. 5-980-001

TABLE 1.08-4





UPTON AND SONORA SERVICE AREA RECOMMENDED PLAN

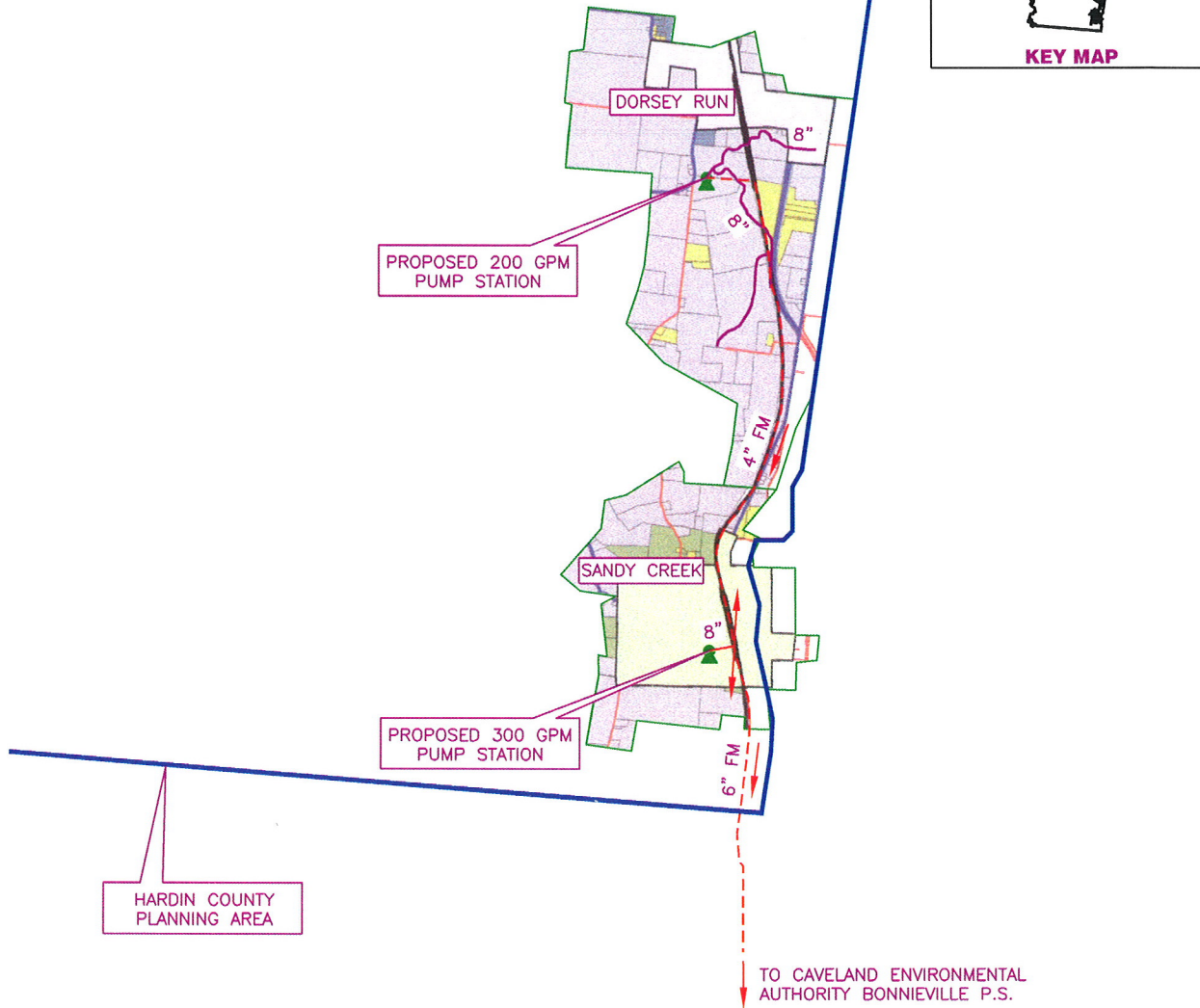
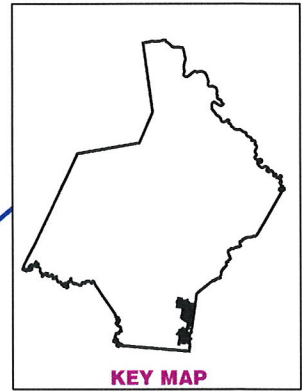
SubWatershed	Area of Concern	Wastewater Flow (mgd)			Recommended Plan	Capital Cost Opinion ⁽¹⁾ (0 to 10 Year)	Capital Cost Opinion ⁽¹⁾ (10 to 20 Year)
		2003	2017	2027			
Dorsey Run and Sandy Creek	Upton and Sonora	0.08	0.09	0.09	Collect wastewater through 8-inch trunk sewer to regional 200 and 300 gpm pump stations with 4-inch and 6-inch force main and on to the Bonnieville Intermediate Pump Station for treatment at the Caveland WWTP.	\$6,204,000	N/A
Total		0.08	0.09	0.09		\$6,204,000	\$0

⁽¹⁾ All capital costs include trunk sewers, pump stations, force mains, and WWTPs, but exclude the collector sewers.

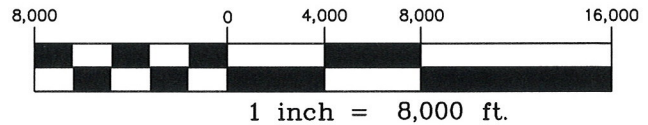
File: S:\05\951--1000\980\001\Wrd\Facilities Plan Report\Figures for Report\Fig. 1.08-7-2017 AND 2027 Upton & Sonora Rec Plan.dwg Time: Oct 10, 2007 - 7:31pm

LEGEND

-  PROPOSED PUMP STATION
-  PROPOSED INTERCEPTOR COLLECTOR SEWER
-  PROPOSED FORCE MAIN - CAVELAND
-  COMMON PROPOSED FORCE MAIN



GRAPHIC SCALE



**DESIGN YEAR 2017 AND 2027 - UPTON AND SONORA SERVICE AREAS
RECOMMENDED PLAN**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 1.08-7

JOB NO. 5-980-001

1.09 PHASED IMPLEMENTATION

Because of the number of regulatory and funding agencies that will be involved in the development of county wastewater conveyance and treatment, and the length of time required for each, implementation of the recommended plan should begin as soon as possible to eliminate failing on-site wastewater treatment systems and protect the environment and the public health for the residents of Hardin County.

Hardin County Water District No. 2 should initiate the following actions:

1. Review, approve, and adopt this Facilities Plan report. Resolutions will be required by HCFC (adopting the planning area), HCWD2 (adopting the plan), HCWD1 (adopting the plan), and City of Elizabethtown (adopting their revised planning area).
2. Conduct a public hearing to discuss the Facilities Plan Report and Recommended Plan.
3. Submit the adopted Facilities Plan to the Kentucky Environmental and Public Protection Cabinet–Division of Water for review, comment, and approval.
4. Initiate the procurement process for engineering services necessary for the design, bidding, and construction of the facilities described in the Recommended Plan according to the requirements of the anticipated funding sources.
5. Gauge public interest, development pressure, public health, environmental impact, and availability of funding to prioritize 0- to 10-year projects.
6. Pursue sources of grant monies for the proposed projects.
7. Study and implement a customer System Development Charge to begin equitably charging new customers for their share of the proposed infrastructure.
8. Study and implement a customer rate to help offset the cost for continued improvement to your system. PSC approval is likely required.
9. Procure the sites to build new pump stations and acquire easements for gravity sewer and force mains as soon as it is feasible.
10. Negotiate equitable Interlocal Agreements with those treatment entities included in the Recommended Plan (Elizabethtown, Caveland Environmental, Radcliff, and Fort Knox).

1.10 RATE IMPACTS

HCWD2 does not have any customers at the present time, therefore, has no rate structure in place. The potential user charge rates for a representative service area (Brushy Fork Watershed–Burns-Deckard School Road) were computed based on many assumptions for funding sources and O&M costs. The evaluation predicted that a customer discharging 4,000 gallons per month would be charged about \$41 per month, an annual total cost of \$490 per year. Each homeowner would also be responsible for paying an assessment for the cost of collector sewer construction. An official rate study should be conducted to establish fair and equitable rates once the project is near completion. The Public Service Commission would be required to approve any rates prior to adoption.

HCWD2 will have to evaluate rates for each specific service area and determine the equatability of charging rates that vary by area, or rates that are universal. Rate determinations for other service areas are too dependent on actual project costs and funding scenarios to be predicted in this report. There is risk in under and over projecting potential rates.

1.11 PUBLIC PARTICIPATION

Many opportunities were presented for the public to be informed of the Regional Facilities Plan and its development. An advisory committee of key stakeholders was assembled to provide necessary input. In addition, a public hearing was held on October 25, 2007 to present the findings of this report, including impacts to present users. The following paragraphs discuss the public hearing process. Meeting minutes of the public hearing is included in Appendix A.

A. Advertisement

A public notice was published in the News-Enterprise on October 11 and October 18, 2007. A copy of the notice is included in Appendix B.

B. Public Hearing

A public hearing was held at 6:30 P.M. on October 25, 2007 at the H. B. Fife Courthouse in Elizabethtown, Kentucky. The presentation prepared for the hearing is included in Appendix C. A copy of the sign-in sheet is also attached.

C. Thirty-Day Public Comment Period

A 30-day public comment period was provided beginning on October 11, 2007 and extending to November 12, 2007. A copy of the Plan was available for public review at the Hardin County Water District No. 2 office at 360 Ring Road, Elizabethtown, KY during normal business hours. No comments were received.

As a result of the above process, the public participation requirements are satisfied and review of the facilities plan may proceed.

SECTION 2
INTRODUCTION AND BACKGROUND

2.01 INTRODUCTION

Strand Associates, Inc.[®] has been authorized by the Hardin County Water District No. 2 (HCWD2) to evaluate the wastewater needs within the unincorporated areas and areas without wastewater service in Hardin County. As these needs may have an impact on the wastewater facilities of the other major municipalities in the county, Hardin County Water District No. 1 (HCWD1), HCWD2, Elizabethtown, Radcliff, Fort Knox, and Vine Grove, KY are cooperating in this planning effort. This plan is not intended to be an update to the existing Regional Wastewater Facilities plan for Elizabethtown, Radcliff, Fort Knox, or Vine Grove, however some of this plan may prove beneficial to those entities when they elect to update their plans.

A Regional Wastewater Facilities Plan (RWWFP) is a comprehensive plan for the management of wastewater collection and treatment. The intent of an RWWFP is to define the most appropriate 'local' solution to providing wastewater service (collection and treatment) for a defined planning area over a defined period of time. Typically, the period of time is 20 years; however, other periods of time can be used. This report considers a 20-year planning period.

This RWWFP was initiated by HCWD2 in order to address significant population growth in areas of Hardin County without adequate wastewater treatment and the resulting impacts on public health and the environment.

2.02 PURPOSE AND SCOPE OF REPORT

The purpose of this RWWFP is to ultimately protect the environment of Hardin County and the health of its residents by providing reliable, cost-effective wastewater collection and treatment for areas of greatest need within the county. This RWWFP is intended to be a road map of the development and implementation of cost-effective wastewater conveyance and treatment alternatives for Hardin County. Objectives of this plan include:

1. Assessing the potential of utilizing existing collection and treatment systems in the county.
2. Providing growth/expansion projections that may be expected in the county.
3. Assessing the feasibility of providing wastewater collection systems to areas of need throughout the county.
4. Providing solutions to address capacity problems of existing package treatment facilities.
5. Identifying alternatives for treating the anticipated wastewater flows.
6. Evaluating and recommending the most favorable alternatives.

7. Providing guidance for implementation of the recommended alternatives with regard to scheduling and financial considerations.

2.03 KENTUCKY DIVISION OF WATER CONSIDERATIONS

Since the RWWFP ultimately needs to be reviewed and approved by the Kentucky Division of Water (KDOW), this report will follow KDOW guidelines. KDOW requires a checklist be submitted with the completed RWWFP. A copy of the most current checklist (dated October 10, 2007) is included as Appendix D for reference. Review and approval considers environmental and state clearinghouse reviews in addition to a technical review.

2.04 DEFINE THE PLANNING AREA

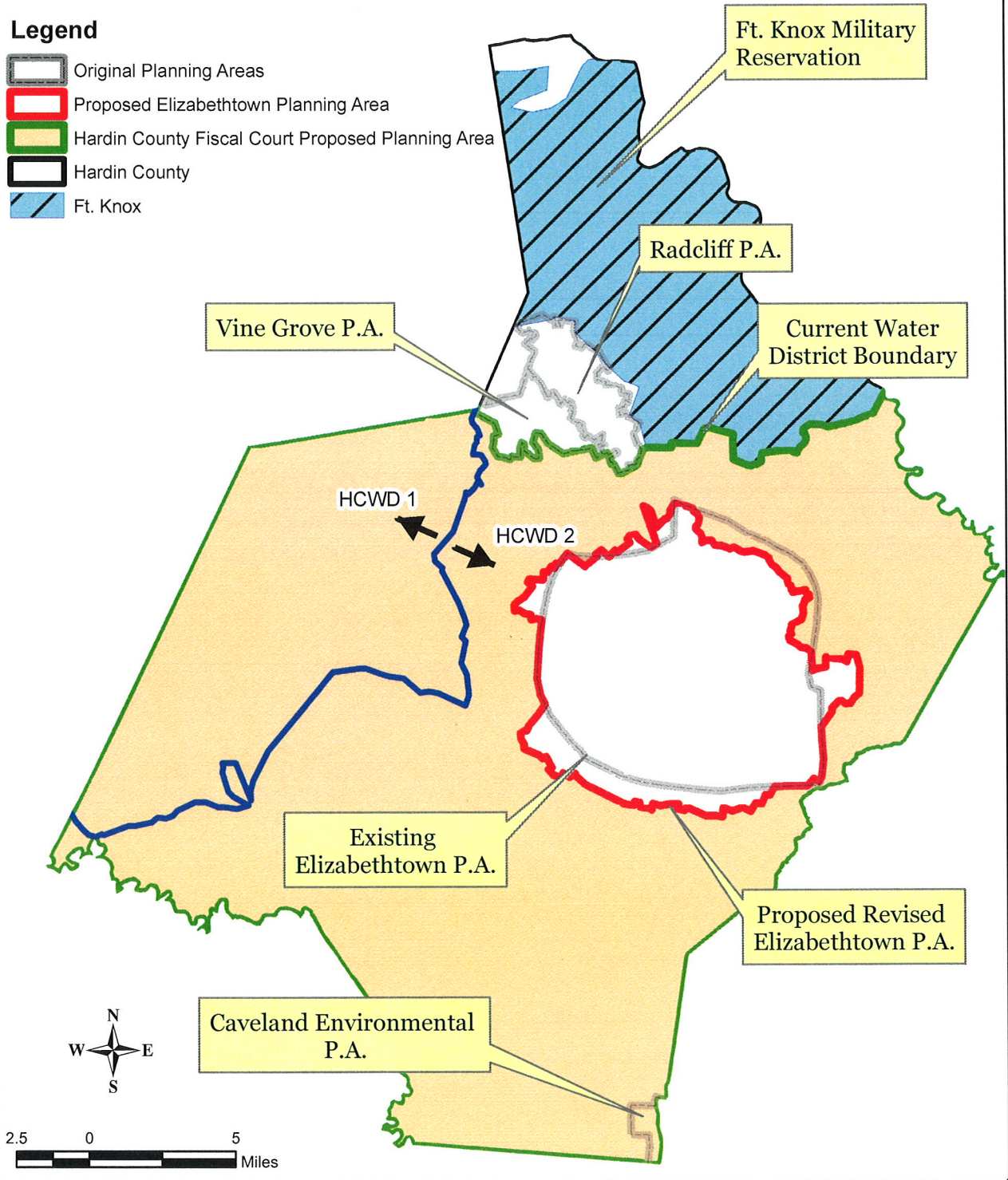
The planning area defines the boundaries in which alternatives are to be evaluated. Planning area boundaries can follow legal boundaries, but are preferred to follow drainage boundaries, if possible, as it is easier to provide collection services by gravity rather than by pumping. Planning areas should encompass populated areas, existing wastewater treatment plant (WWTP) discharges, areas with failing septic systems, areas with no treatment (straight pipes), proposed discharge sites (if a new WWTP is proposed), known future developments, administrative boundaries, and water supplies (wellhead/groundwater protection, lakes/reservoirs) to protect supply of drinking water. Planning areas can provide protection against propagation of future package plants. With an approved RWWFP, KDOW would offer the planning entity the right of first refusal for serving any new discharge.

Before the RWWFP can be approved, resolution from the fiscal court and other affected entities will be required for the new planning area. In the event the planning area should extend beyond the Hardin County line, resolutions from other affected county fiscal court(s) are required. Once the plan is approved, any modifications to the planning area boundaries require resolutions of acceptance from those impacted entities.

The planning area in this study consists of areas in Hardin County not currently served by a municipal wastewater facility or included in an existing municipal planning area. The planning area includes portions of the county that are anticipated to experience strong population growth over the next 20 years. These areas are subdivided into 31 subwatersheds, which allow a more defined means of developing projected wastewater flows and wastewater treatment alternatives. The subwatersheds with the highest anticipated population growth are considered for public sanitary sewer service in the 0- to 10-year time period of the 20 year planning horizon. The remaining subwatersheds have slower anticipated population growth and are considered in the 11-to 20-year time period of the 20 year planning horizon. Figure 2.03-1 illustrates existing planning area boundaries within the county and the proposed Hardin County Fiscal Court planning area boundary. Hardin County Fiscal Court (HCFC) will divide the planning area between HCWD1 and HCWD2. The anticipated delineation is based on the water service divided between HCWD1 and HCWD2, however, HCFC can revise the sewer service areas at their discretion.

Legend

-  Original Planning Areas
-  Proposed Elizabethtown Planning Area
-  Hardin County Fiscal Court Proposed Planning Area
-  Hardin County
-  Ft. Knox



**EXISTING AND PROPOSED
PLANNING AREAS**

**HARDIN COUNTY REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KY**



**FIGURE 2.03-1
5-980-001**

2.05 DEFINITIONS AND ABBREVIATIONS

The following abbreviations may be utilized throughout this planning document.

BOD	–	Biological Oxygen Demand
cfu	–	colony forming units
cip	–	cast iron pipe
csp	–	concrete sewer pipe
dip	–	ductile iron pipe
DMR	–	Discharge Monitoring Report
FEMA	–	Federal Emergency Management Agency
gpd	–	gallons per day
gpcd	–	gallons per capita per day
gpm	–	gallons per minute
HCFC	–	Hardin County Fiscal Court
HCWD1	–	Hardin County Water District No. 1
HCWD2	–	Hardin County Water District No. 2
KDOW	–	Kentucky Division of Water
KSDC	–	Kentucky State Data Center
KPDES	–	Kentucky Pollutant Discharge Elimination System
lbs/day	–	pounds per day
MGD	–	million gallons per day
mg/L	–	milligrams per liter
NH ₃ -N	–	ammonia-nitrogen
O&M	–	Operation and Maintenance
psi	–	pounds per square inch
pvc	–	polyvinyl chloride
RWWFP	–	Regional Wastewater Facilities Plan
SDR	–	Standard Dimension Ratio
SSO	–	sanitary sewer overflow
TDH	–	total dynamic head
TSS	–	total suspended solids
USEPA	–	United States Environmental Protection Agency
USGS	–	United States Geological Survey
vcp	–	vitrified clay pipe
WWTP	–	Wastewater Treatment Plant

2.06 RELATED STUDIES AND REPORTS

University of Kentucky, “Kentucky Atlas and Gazetteer,” n.d.,
<<http://www.uky.edu/KentuckyAtlas/21093.html>>.

Kentucky Geological Survey, “Water Data,” April 27, 2005,
<<http://www.uky.edu/KGS/water/library/gwatlas/Hardin/Foreword.htm>>.

Kentucky Cabinet for Economic Development, "Hardin County – Quality of Life," 2004, <<http://www.thinkkentucky.com/edis/cmnty/QltyLife.aspx?cw=003>>.

Kentucky Geological Survey, "Geospatial Data Library," January 13, 2005, <http://www.uky.edu/KGS/gis/kgs_gis.html>

2002-303(d) *List of Waters for Kentucky*, Kentucky Report to Congress on Water Quality, Commonwealth of Kentucky Natural Resources and Environmental Protection Cabinet, Division of Water, January 2003.

United States Department of Agriculture, "National Agricultural Statistics Service," n.d. <http://www.nass.usda.gov/Statistics_by_State/Kentucky/index.asp>

Scorecard, "Pollution in Your Community," n.d. <http://www.scorecard.org/env-releases/cap/county.tcl?fips_county_code=21093>

United States Fish & Wildlife Service, "Threatened and Endangered Species in Kentucky," January 2002, <<http://www.fws.gov/cookeville/docs/endspec/ky/kycty.html>>

Lincoln Trail Area Development District, 2007, <<http://www.ltadd.org/#>>

**SECTION 3
EXISTING ENVIRONMENT**

3.01 INTRODUCTION

The assessment of environmental characteristics of Hardin County is a critical portion of the Regional Wastewater Facilities Plan. To date, many areas of Hardin County are not considered in any Regional Wastewater Facilities Plan (RWWFP). This RWWFP will provide the county with a plan for providing cost-effective wastewater collection, treatment, and disposal for areas within the planning area. Current and future needs for Hardin County will be considered. To effectively plan for these future needs, it is crucial to understand the environmental setting of the area.

3.02 PHYSIOGRAPHY

As shown in the *Kentucky Atlas and Gazetteer*, Hardin County lies in the Mississippian Plateaus physiographic region defined by sinkholes, subsurface channels, and karst topography. These geological formations can cause negative effects on water quality. The northern section of the Mississippian Plateaus form Muldraugh Hill, which divides the Mississippian plateaus from the Knobs and the Bluegrass physiographic formations.

A. Topography








Based on the United States Geological Survey (USGS), elevations in Hardin County range from 383 feet to 1,017 feet above mean sea level. Topography can play an important role in collecting and transporting wastewater. The influence of topography will be considered during development of detailed alternatives. For example, the City of Elizabethtown is nestled just south of a ridge that runs east-west through the middle of the county. Areas below the divide to the northeast and northwest naturally flow into Elizabethtown. Serving those areas by gravity with existing infrastructure may prove easier than areas south of the city. Areas south of Elizabethtown are lower in elevation and may require a separate treatment facility or a series of pump stations to convey wastewater to Elizabethtown's system. Similar observations can be made for areas above the divide. Figure 3.02-1 shows the major watersheds in the county relative to planning area boundaries.

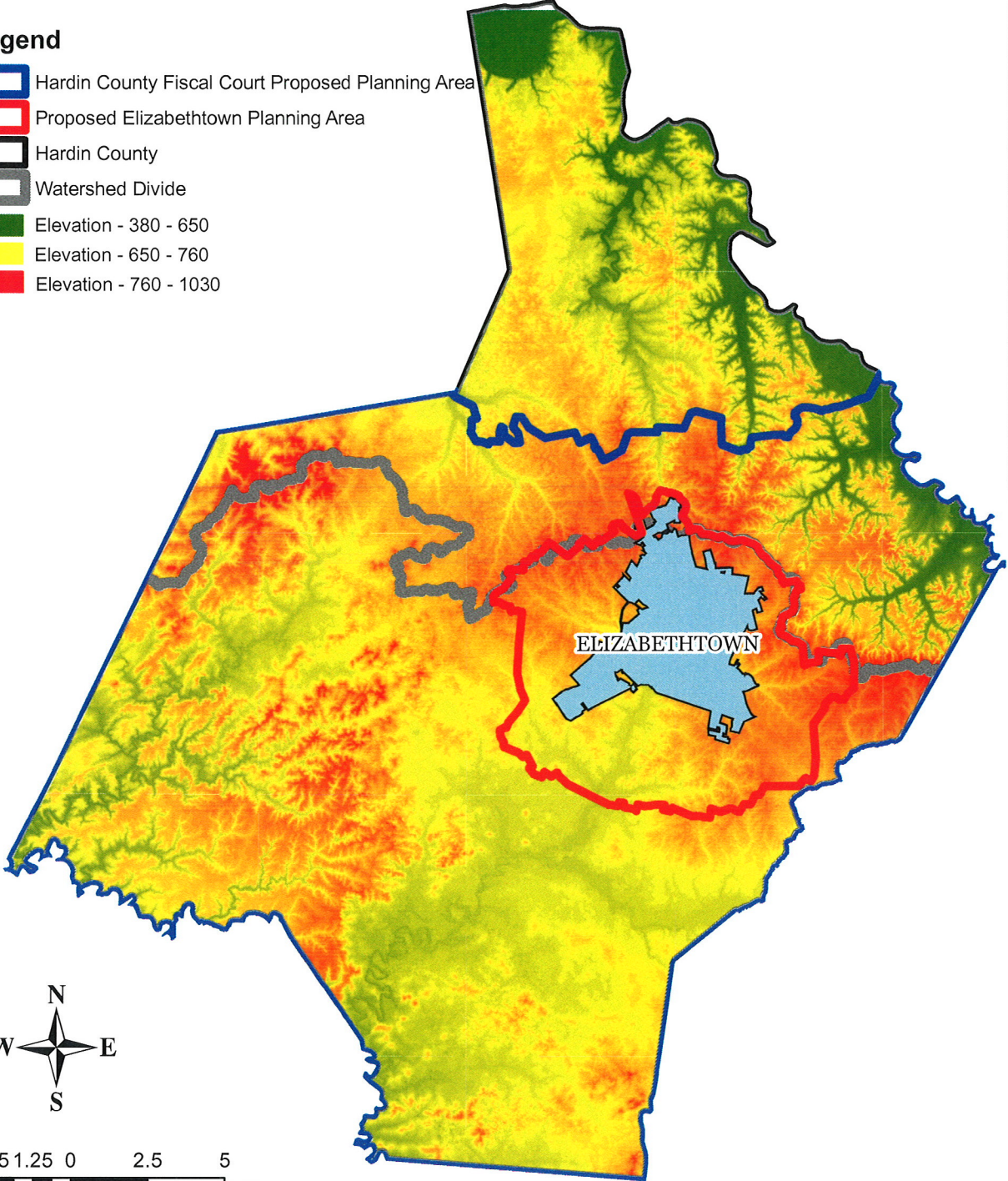
B. Geology

Based on the USGS, the geology of Hardin County is composed of rock formations from the Devonian and Mississippian age. These formations consist of Alluvium, New Albany Shale, Mississippian sandstones and siltstones, with the most commonly found formations being Mississippian limestones. Because of the mass occurrence of limestone in the area, Hardin County is predominately a karst area. Karst areas are characterized by underground streams, caverns, and sinkholes. Most of the county is categorized as 'major karst', with some areas 'minor karst'. A few areas such as those along Rolling Fork and Upper Nolin are not considered karst. Since the county is mostly karst, groundwater can be more easily contaminated by surface water and inadequately treated wastewater. Because there are a great number of sinkholes, most of the county is considered very highly hydrosensitive for groundwater contamination. Figure 3.02-2 illustrates sensitivity to groundwater contamination throughout Hardin County. Septic systems and direct pipes under these conditions can easily have a major impact on groundwater quality.

S:\051951-10001950\001\Wrd\Facilities Plan Report\Figures for Report\Fig. 3.02-1 Topography

Legend

-  Hardin County Fiscal Court Proposed Planning Area
-  Proposed Elizabethtown Planning Area
-  Hardin County
-  Watershed Divide
-  Elevation - 380 - 650
-  Elevation - 650 - 760
-  Elevation - 760 - 1030



**HARDIN COUNTY
TOPOGRAPHY**

**HARDIN COUNTY REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KY**

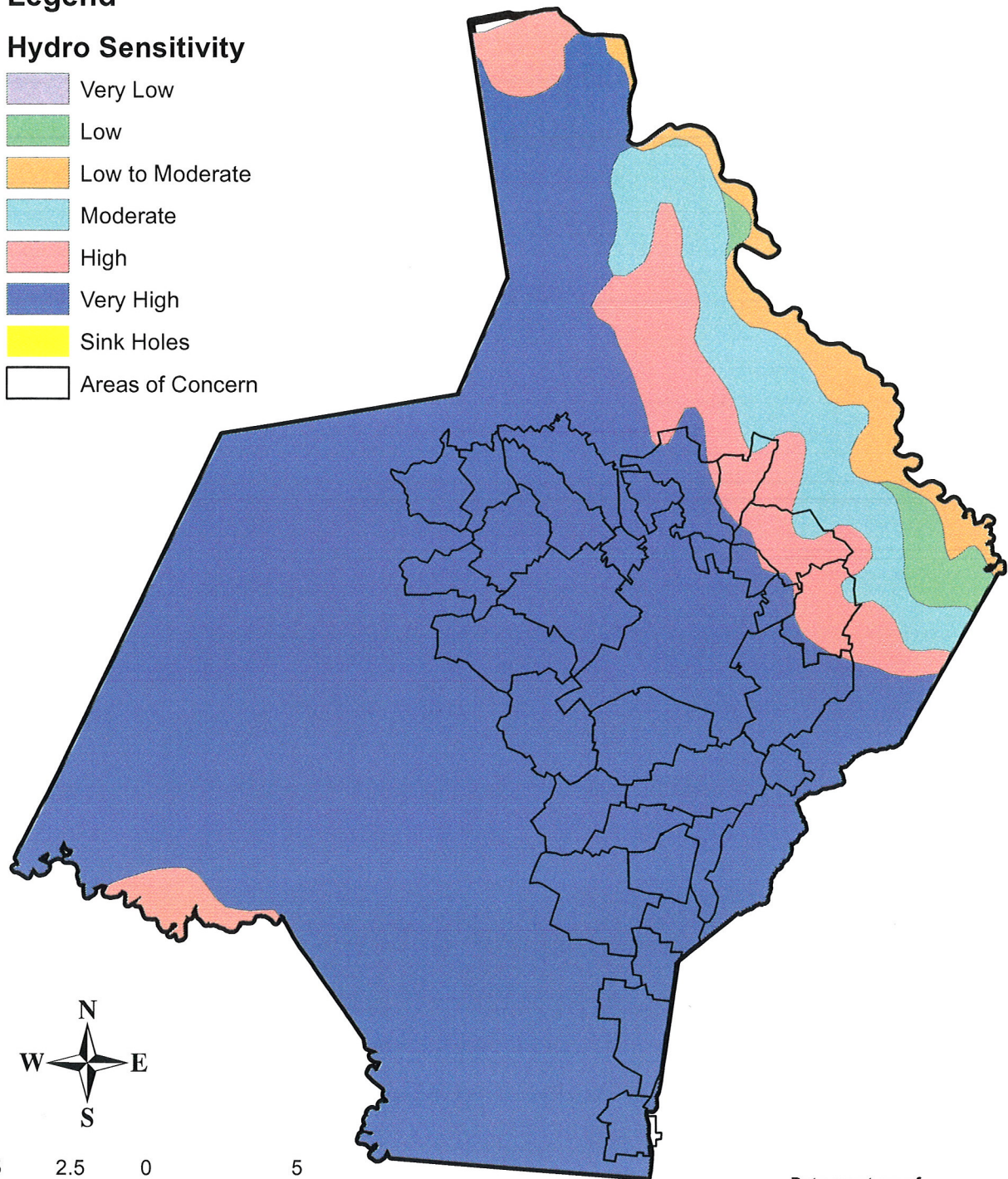


**FIGURE 3.02-1
5-980-001**

Legend

Hydro Sensitivity

-  Very Low
-  Low
-  Low to Moderate
-  Moderate
-  High
-  Very High
-  Sink Holes
-  Areas of Concern



Data courtesy of
Kentucky Division of Water

GROUNDWATER SENSITIVITY TO CONTAMINATION REGIONAL WASTERWATER PLAN

HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY



FIGURE 3.02-2
5-980-001

C. Soils

The majority of the soils in Hardin County are silty loam or clay loam, neither of which is considered desirable for on-site systems with subsurface disposal. The quality of the soil in an area relative to use in on-site disposal of wastewater is very important when considering wastewater facilities. Figure 3.02-3 shows the soil map for Hardin County screened for suitability of on-site disposal. Septic system absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Excessive permeability, a high water table, shallow depth to bedrock, karst formations, and flooding negatively affect the proper absorption of the septic tank effluent. There must be acceptable unsaturated soil material beneath the absorption field to filter the effluent effectively. Unsatisfactory performance of septic system absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage can detrimentally impact public health as effluent can then become part of runoff. Groundwater can also be polluted if karst formations are near, if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if site slope is excessive, or if the water table is near the surface.

All new on-site systems with subsurface disposal are permitted by the Hardin County Health Department-Environmental Health Office.

3.03 HYDROLOGY

Hydrology is the scientific study of the properties, distribution, use, and circulation of all the water of the earth and its atmosphere. This includes such factors as precipitation, groundwater and surface water storage and flow, and evaporation. The following addresses such factors in the vicinity of the planning area.

A. Precipitation

The average annual precipitation in Hardin County, Kentucky is 45.91 inches per year. The average annual snowfall is 15.7 inches per year. There are about 131 days per year that have recordable precipitation (defined as 0.01 inches or more).

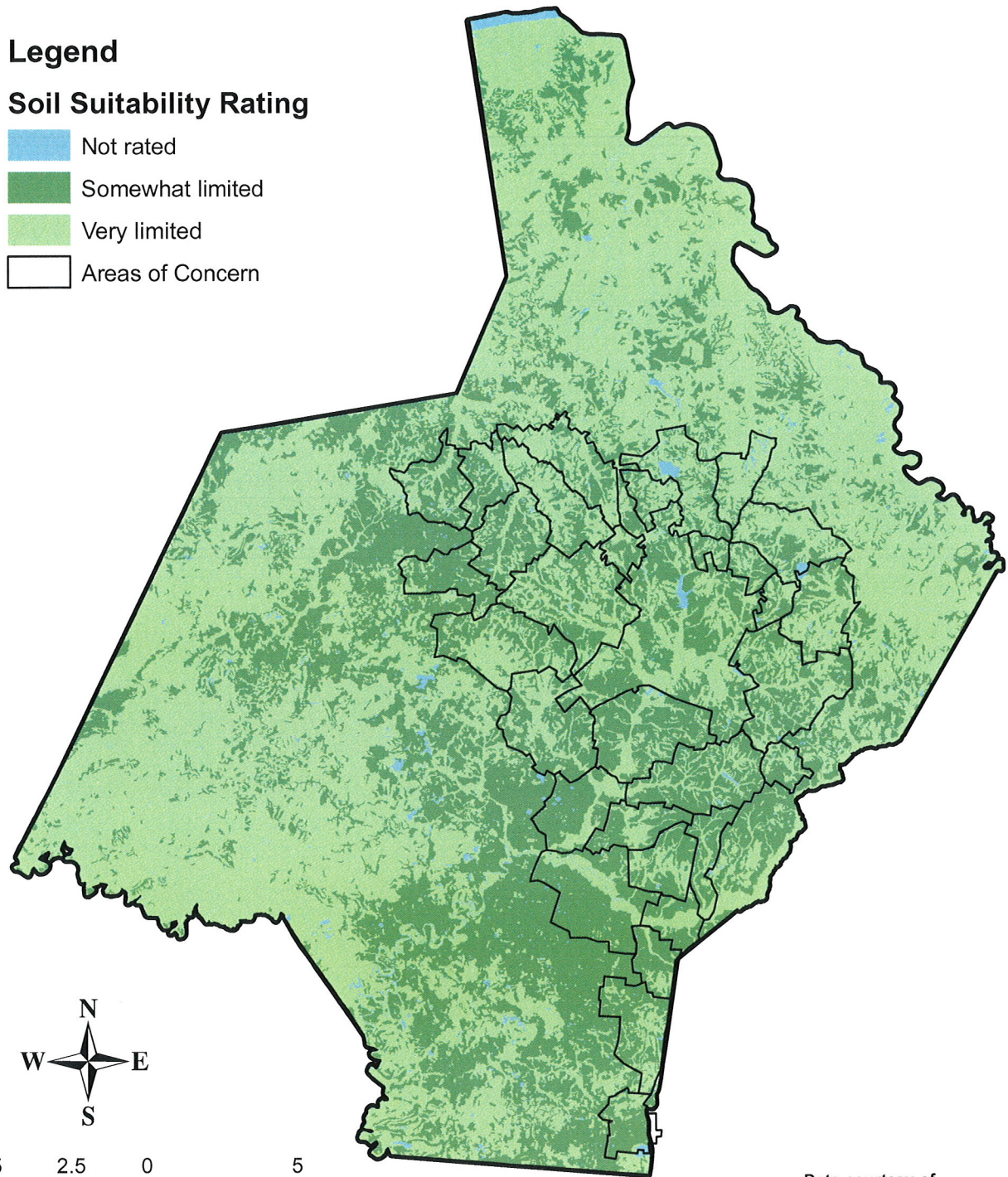
B. Groundwater

The geological features of Hardin County have varying potential for groundwater yield and quality. The following descriptions of yield and quality start from near surface formations. Groundwater found in alluvial deposits generally yields anywhere from 100 to 500 gallons per day. The water obtained from these formations may be hard with high iron content. The Girkin formation does not typically produce adequate yields for domestic consumption. The Ste. Genevieve limestone formation contains connected large subsurface streams. Groundwater yields in this formation can equal or exceed 72,000 gallons per day. The St. Louis limestone formation can produce up to 72,000 gallons per day. Springs originating from this formation are typically used for public and industrial water supply in the county. The Salem and Harrodsburg limestone formations can produce yields from 100 to 500 gallons per day. The water from these formations is usually hard. The Borden formation can produce from 100 to 500

Legend

Soil Suitability Rating

-  Not rated
-  Somewhat limited
-  Very limited
-  Areas of Concern



Data courtesy of
Kentucky Geological Survey

SOIL SUITABILITY FOR ONSITE WASTEWATER SYSTEMS REGIONAL WASTEWATER FACILITIES PLAN

HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY



FIGURE 3.02-3
5-980-001

gallons per day or more. Water from this formation can contain iron, salt, or sulfate. The New Albany shale formation can yield from 100 to 500 gallons per day. Water from this formation can contain salt or hydrogen sulfide, and is usually hard.

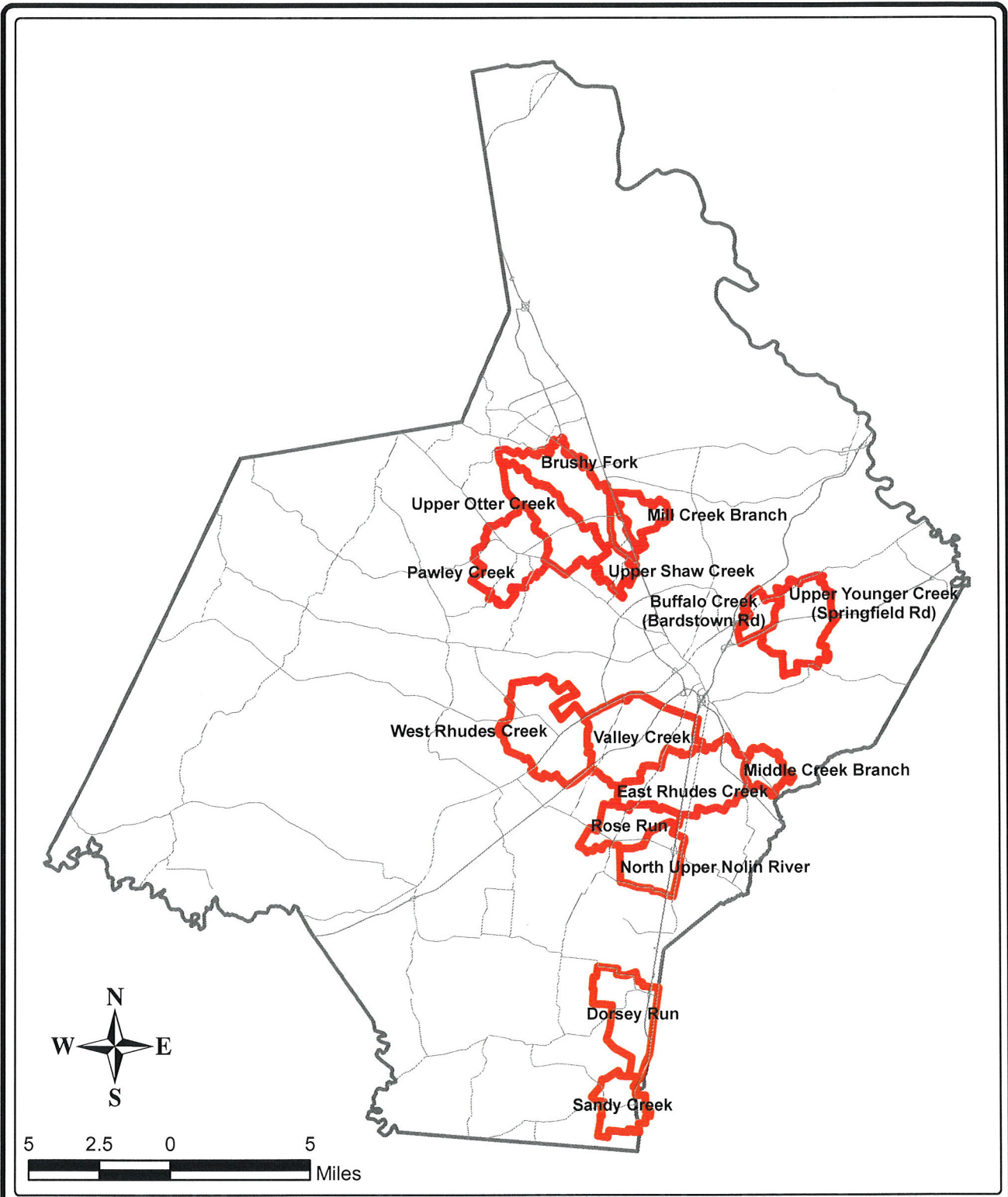
C. Surface Water

Hardin County contains numerous streams and their respective tributaries that directly connect to the Ohio River which borders the northern most part of the county. The Rough River forms part of the southern border of the county. It too eventually flows to the Ohio River, but at point much further downstream. These two rivers are the two major drainage basins in the county. Surface water generally flows to one or the other. For the purposes of this RWWFP, areas with current or anticipated wastewater needs within Hardin County were divided into 31 sub watersheds. For purposes of developing alternatives, the watersheds were considered for improved service in either the 0- to 10-year time period or the 10- to 20-year time period of the 20 year planning horizon. Figures 3.03-1 and 3.03-2 illustrate the watersheds considered in this RWWFP.

3.04 100-YEAR FLOOD PLAIN LIMITS

Areas prone to flooding should be identified in the Regional Wastewater Facilities Plan. The established flood zones are shown in Figure 3.04-1. These zones are based on information from the Federal Emergency Management Data Agency (FEMA). FEMA defines many zones with regard to flooding. Zone X is defined as outside the 100- and 500-year flood limits. The majority of the county is in this zone. Flood Zones A and AE are both 100-year flood areas. Zone AE are areas from which a base flood elevation has been determined, Zone A has no base elevation. The 100-year flood areas in the county include:

1. Nolin River.
2. Rough River near Vertrees and again along the southerly county border.
3. Sandy Creek south of Sonora.
4. Valley Creek south of the Elizabethtown city limits.
5. East and West Rhudes Creek as they merge with Valley Creek near Bacon Creek Road.
6. Shaw Creek and Freeman Creek confluence near the Elizabethtown Bypass and Mulberry Street.
7. Billy Creek's confluence with Valley Creek south of the bypass.
8. Much of Rolling Fork, Mill Creek, and Cedar Creek north of Elizabethtown.
9. Flippin Creek, Otter Creek, and Brushy Fork in Radcliff and Vine Grove.



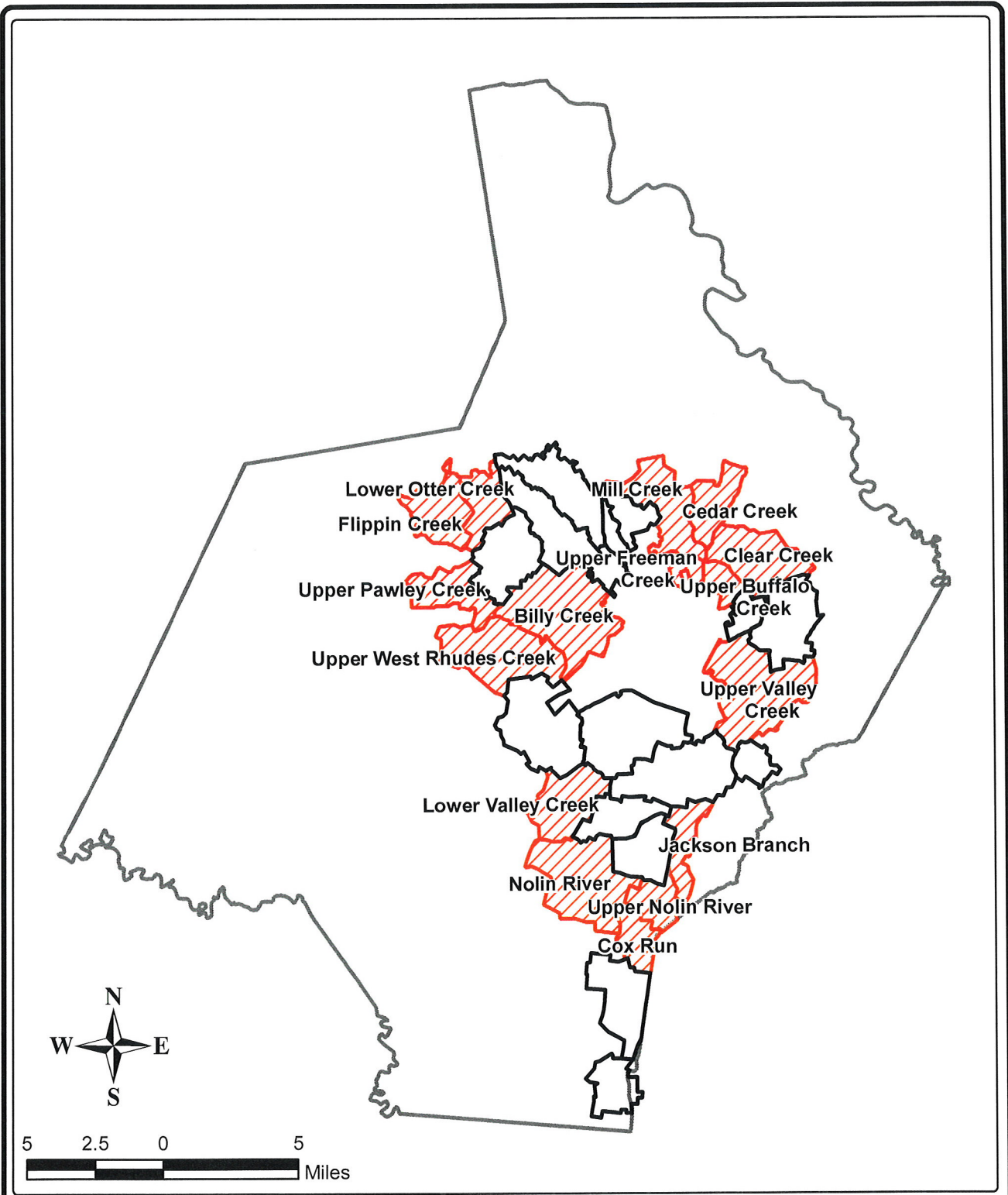
**WATERSHEDS WITH IDENTIFIED NEEDS
(0-10 Year Areas of Concern)**

REGIONAL WASTEWATER FACILITIES PLAN

**HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



**FIGURE 3.03-1
5-980-001**



**NEAR URBAN WATERSHEDS
(11-20-Year Areas of Concern)
REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**

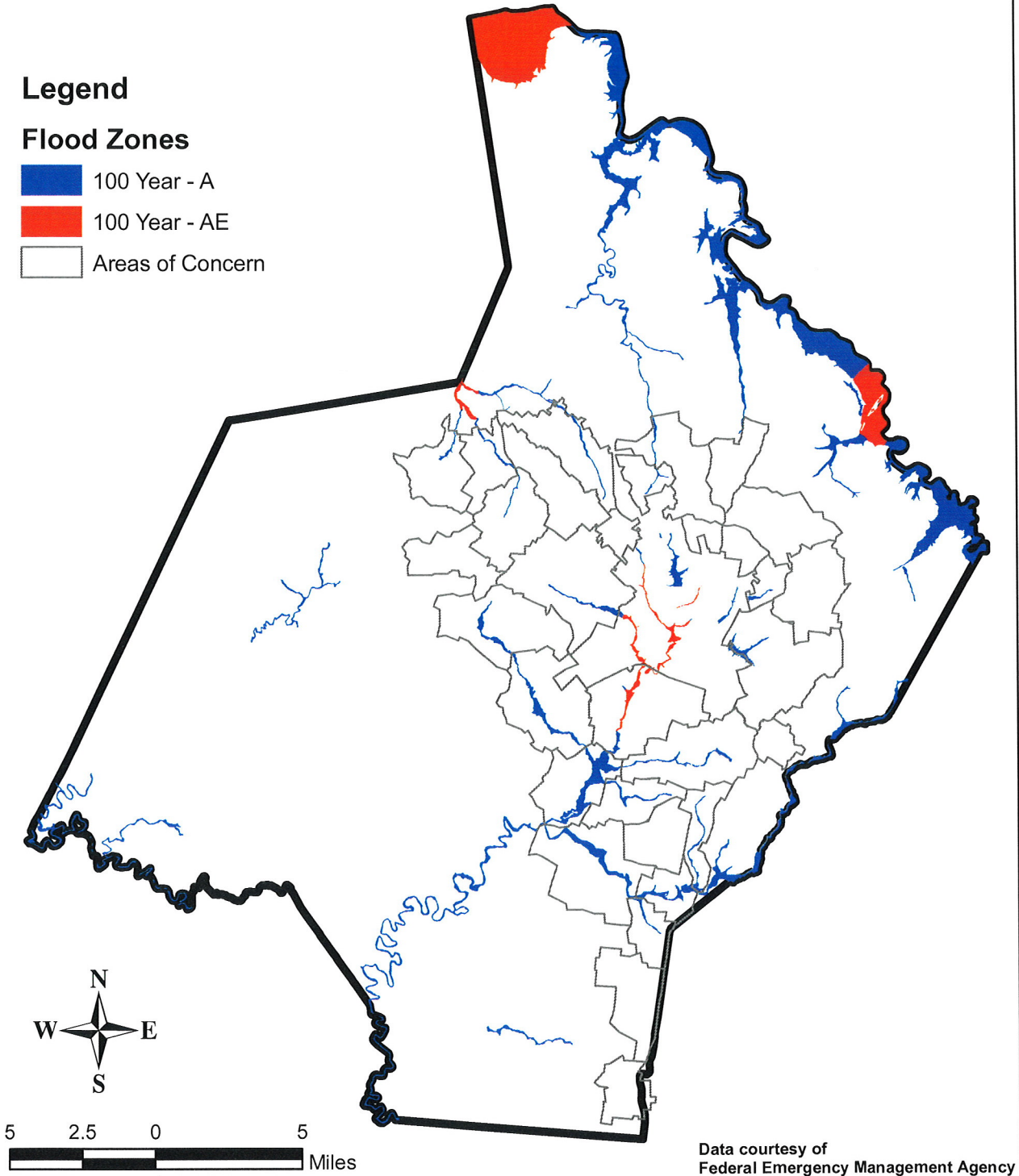


**FIGURE 3.03-2
5-980-001**

Legend

Flood Zones

-  100 Year - A
-  100 Year - AE
-  Areas of Concern



FLOOD ZONES

REGIONAL WASTERWATER FACILITIES PLAN

HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY



FIGURE 3.04-1
5-980-001

Construction in the 100-year flood plain should be avoided or at least minimized. However, for wastewater collection systems it is essentially unavoidable. Intercepting sewers and pump stations are often constructed within the 100-year flood plain. KDOW allows this, but requires the pump stations to be accessible in the 25-year flood. Electrical gear and controls are to be protected to the 100-year flood elevation. Manholes are to be sealed watertight.

Often WWTPs also have to be constructed in the 100-year flood plain. Such WWTP construction must be protected to allow operation up to the 100-year flood elevation.

3.05 WATER QUALITY AND STREAMS AND LAKES IN PLANNING AREA

The 305(b) and 303(d) reports originate from the Clean Water Act. These reports are submitted to Congress to provide water quality information in an area and define water bodies considered impaired, respectively. Hardin County has some 60 streams excluding the Ohio River and the Rough River and about 10 lakes. Several lakes and streams have segments considered “impaired”. Impaired streams are streams that are not supporting their designated use or only partially supporting use as listed in Kentucky’s 305(b) report to Congress. Among these uses are fishable and swimmable categories. These impaired streams are listed on the KDOW 303(d) list.

There are seven stream segments in Hardin County that are classified as “not supporting” and two segments that are classified as “partially supporting” designated uses. These streams are shown in Figure 3.05-1. Tables 3.05-1 and 3.05-2 describe the stream segments that are considered impaired, whether or not they are “nonsupporting” or “partially supporting,” their respective impaired use, and the suspected pollution sources as determined by KDOW.

A small portion of Rough River Lake in Hardin County is listed in the 305(b) report as having a partial use failure for fish consumption. The pollutant is listed as Mercury, however, the source is unknown. Freeman Lake, located in Elizabethtown, is the only other Hardin County lake that is monitored. It was found to be fully supportive of all use categories. Rough River Lake is shown in Figure 3.05-1.



3.06 WETLANDS IN PLANNING AREA

The accepted definition of wetland is an area that is inundated by surface or ground water with a frequency sufficient to support, and under normal circumstances, does support a prevalence of vegetation or aquatic life that requires saturated soil conditions for growth and reproduction. Wetlands generally include swamps, marshes, bogs, and similar areas such as sloughs, potholes, wet meadows, river overflows, mud flats, and natural ponds. The largest wetland areas in Hardin County are around Rough River Lake, southern portions of Nolin River—especially along the Hardin County border, Freeman Lake, and Rolling Fork. Construction in wetlands should be avoided as special permitting would be required. The locations of wetlands are shown in Figure 3.06-1. Alternatives developed for the collection and treatment should, if possible, avoid wetlands.






S:\051951-1\0001980\001\WV\1-Facilities Plan Report\Figures for Report\Environment-Figures\3.05-1-Impaired Water Quality

Legend



Impaired Streams

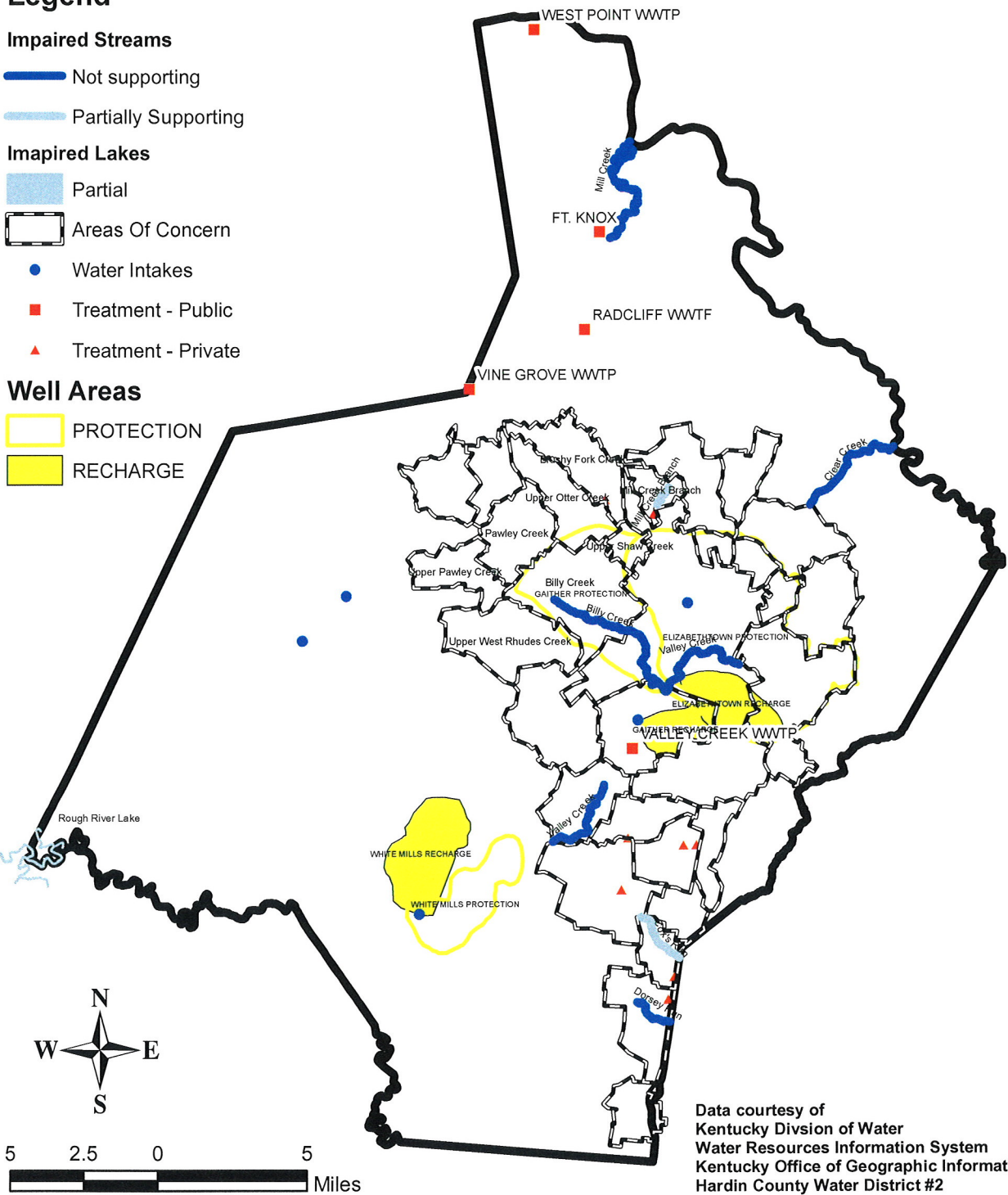
-  Not supporting
-  Partially Supporting

Impaired Lakes

-  Partial
-  Areas Of Concern
-  Water Intakes
-  Treatment - Public
-  Treatment - Private

Well Areas

-  PROTECTION
-  RECHARGE



Data courtesy of
 Kentucky Division of Water
 Water Resources Information System
 Kentucky Office of Geographic Information
 Hardin County Water District #2

**AREAS OF CONCERN
 GROUNDWATER PROTECTION, IMPAIRED STREAMS AND LAKES
 REGIONAL WASTERWATER FACILITIES PLAN**

**HARDIN COUNTY WATER DISTRICT NO. 2
 HARDIN COUNTY, KENTUCKY**



**FIGURE 3.05-1
 5-980-001**

TABLE 3.05-1

NONSUPPORTING STREAM SEGMENTS

Mill Creek of Salt River from mile 6.0 to 7.0

- Impaired Use(s): Aquatic Life (Nonsupport), Fish Consumption (Nonsupport)
- Pollutant(s): Mercury
- Suspected Sources: Municipal Point Sources (Major Municipal Point Sources).

Comment: Entirely contained on the Ft. Knox reservation. It is based on DMR data from Fort Knox. The KPDES permit requires in-stream monitoring upstream and downstream of the discharge location to define the contribution of mercury from the area. A streamflow gauging station has been installed.

Clear Creek of Rolling Fork from mile 0.0 to 4.4

- Impaired Use(s): Aquatic Life (Nonsupport)
- Pollutant(s): Unknown
- Suspected Sources: Unknown

Comment: Near Upper-Colesburg Road and I-65

Billy Creek of Valley Creek from mile 0.0 to 5.9

- Impaired Use(s): Swimming (Nonsupport), Aquatic Life (Partial Support)
- Pollutant(s): Siltation, Organic Enrichment/Low DO, Habitat Alterations (Other than Flow)
- Suspected Sources: Unknown

Comment: Section begins in Elizabethtown beyond Ring Road between Rineyville Road and St. John Road. It crosses Ring Road and turns toward Mulberry where it joins with Valley Creek near Central Hardin High School.

Valley Creek of Nolin River from mile 10.3 to 11.8

- Impaired Use(s): Swimming (Nonsupport)
- Pollutant(s): Pathogens
- Suspected Sources: Unknown

Comment: This segment of Valley Creek begins south of downtown Elizabethtown outside of I-65. It flows toward the downtown area, crossing under Dixie Highway just south of the Square. It follows along Mulberry until it crosses under the bypass.

Valley Creek of Nolin River from mile 8.0 to 10.3

- Impaired Use(s): Aquatic Life (Nonsupport)
- Pollutant(s): Siltation, Nutrients, Flow Alterations, Habitat Alterations (other than flow)
- Suspected Sources: Industrial Point Sources, Habitat Modification (other than hydromodification)–Removal of Riparian Vegetation and Bank Modification/Destabilization, Agriculture (Crop-related Sources), Agriculture (Grazing-related Sources), Urban Runoff/Storm Sewers (Hwy/Rd/Bridge Runoff)

Comment: This segment begins where the above segment ends along Mulberry to west of the bypass. It meanders along Mulberry until it reaches the confluence with Billy Creek near Central Hardin High School.

Valley Creek of Nolin River from mile 0.0 to 3.5

- Impaired Use(s): Swimming (Nonsupport), Aquatic Life (Partial Support)
- Pollutant(s): Pathogens, Unknown
- Suspected Sources: Unknown, Unknown

Comment: This segment of Valley Creek in Elizabethtown begins along Bacon Creek Road, crosses Glendale-Hodgenville Road until it reaches the confluence with Nolin River.

Dorsey Run of Sinks of Nolin River from mile 1.9 to 3.7

- Impaired Use(s): Aquatic Life (Nonsupport)
- Pollutant(s): Nutrients, Siltation, Habitat Alterations (other than flow), Algae Growth/Chlorophyll_a
- Suspected Sources: Agriculture (Grazing-related Sources–Pasture Grazing–Riparian and/or Upland), Habitat Modifications (other than hydromodification)–Removal of Riparian Vegetation, Urban Runoff/Storm Sewers (erosion and sedimentation)

Comment: Section is south of Sonora, and begins between I-65 and Dixie Hwy. then runs toward Sonora to Flint Hill Road.

TABLE 3.05-2

PARTIALLY SUPPORTING STREAM SEGMENTS

Mill Creek Branch of Mill Creek from mile 0.0 to 0.7

- Impaired Use(s): Aquatic Life (Partial Support)
- Pollutant(s): Organic Enrichment/Low DO, Ammonia (Unionized)
- Suspected Sources: Municipal Point Sources (Package Plants–Small Flows)

Comment: Near AirView Estates. DMR data showed significant noncompliance for ammonia. A Notice of Violation was issued on June 22, 2001 based on an inspection of May 31, 2001. Enforcement actions are continuing. Discussions have also been held with the City of Elizabethtown concerning the possibility of Elizabethtown incorporating this facility into its wastewater treatment network; gauging station has been installed.

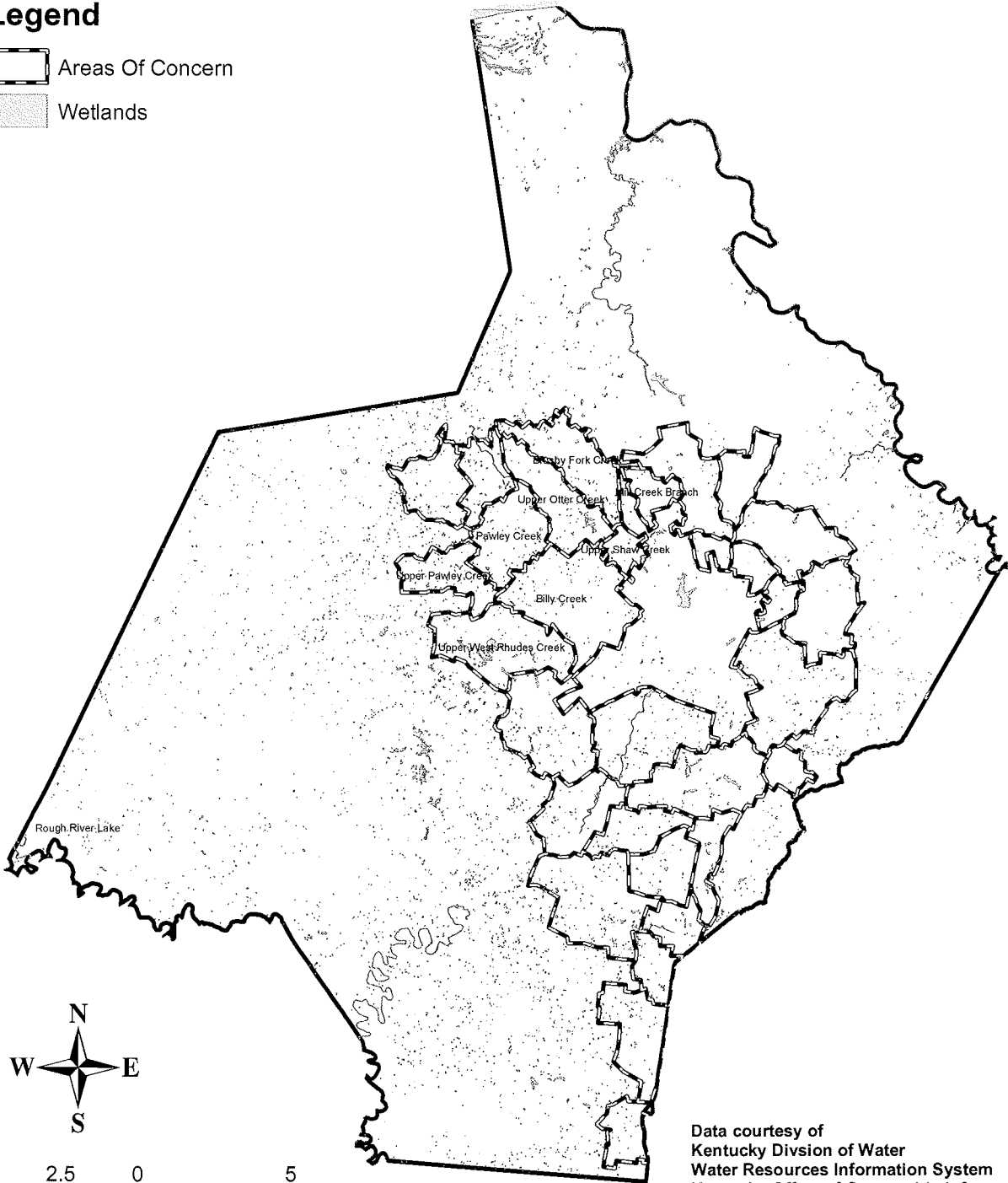
Cox's Run of Nolin from mile 0.0 to 3.2

- Impaired Use(s): Aquatic Life (Partial Support)
- Pollutant(s): Siltation, Nutrients, Habitat Alterations (other than flow)
- Suspected Sources: Agriculture (Crop-related Sources and Grazing-related Sources), Habitat Modifications (other than hydromodification)–Bank Modification/Destabilization, Urban Runoff/Storm Sewers (Hwy/Rd/Bridge Runoff and Erosion and Sedimentation)

Comment: Cox's Run begins along I-65 between the rest stops north of Sonora. It runs northwest along Nolin Road (1407) until the confluence with Nolin River.

Legend

-  Areas Of Concern
-  Wetlands



Data courtesy of
 Kentucky Division of Water
 Water Resources Information System
 Kentucky Office of Geographic Information
 Hardin County Water District #2

**AREAS OF CONCERN
 WETLANDS**
 REGIONAL WASTERWATER FACILITIES PLAN
 HARDIN COUNTY WATER DISTRICT NO. 2
 HARDIN COUNTY, KENTUCKY



FIGURE 3.06-1
 5-980-001

3.07 SEPTIC TANKS, STRAIGHT PIPE DISCHARGE, AND OTHER FAILING SYSTEMS

The majority of residences outside the Elizabethtown, Radcliff, and Vine Grove city limits and within the planning area utilize on-site treatment systems (septic tanks and absorption fields). There are a few small private package plants scattered throughout the proposed planning areas that would be decommissioned once sewers become available to that particular area. The majority of soils in Hardin County are either silty loam or clay loam, neither of which is considered desirable for on-site systems such as septic/subsurface disposal. Most problems with the septic tank systems in the planning area are due to the poor percolating soil conditions (types of soil), small lot sizes, and older systems. High water tables in the area can also limit the effectiveness of the septic tanks/absorption fields. Table 3.07-1 identifies “areas of concern” established through environmental considerations, discussions with the Hardin County Health Department-Environmental Health Office, and discussions with the Advisory Committee. A description of the general conditions of each area is included.

Areas presented in Table 3.07-1 exist within the sub watersheds shown in Figures 3.03-1 and 3.03-2. Wastewater conveyance and treatment alternatives will be developed later to address these areas of concern.

3.08 AGRICULTURAL LAND USE

Based on data from 2002, there are about 1,732 farms in Hardin County covering an area of 239,740 acres. The following data has been obtained from the National Agricultural Statistics Service for this planning area.

A. Cropland

A total of 151,149 acres of farmland was considered cropland in 2002. There were 95,882 acres harvested, 12,041 acres were not harvested, and 43,226 cropland acres were actually used as pasture.

B. Pasture

There were 21,557 acres included in the category “Other Pasture” and 11,974 acres were included in the category “Other Land.”

C. Woodland

A total of 55,060 acres of farmland was considered to be woodland, with 16,744 acres being used as pasture land and 38,316 acres being included in the category “Other.”

The average farm operator age in Hardin County in 2002 was 55. The total market value of agricultural products sold was about \$35.9 million.

TABLE 3.07-1

AREAS OF CONCERN

High Priority

1. LaVista Estates (Pawley Creek Watershed)—This area has at least 400 homes and is problematic. Rolling Heights and LaVista Section 1 are in good shape. LaVista Sections 2 through 6 are problem areas. Most systems are very shallow with only 6-inches of soil. Approximately 10 percent of systems are failing already in this area due to misuse and/or poor soils. Some lots have not been allowed to build with septic systems.
2. Boone Road (Upper Otter Creek Watershed)—This area is problematic. Most systems are very shallow. There are a considerable number of failures already due to misuse and/or poor soils. Some lots have not been allowed to build with septic systems.
3. Burns-Deckard School Road Area (Upper Otter Creek Watershed and Brushy Fork Creek Watershed)—The Burns Road area consists of a lot of clay. The area is very wet and has shallow systems.
4. Smithersville (Upper Shaw Creek Watershed)—This area is essentially a swamp.
5. Airview (Mill Creek Branch Watershed)—This area needs attention. The package plant is too small. This area is close to the Elizabethtown collection system.
6. Gilead Church—Glendale Road Area (North Upper Nolin River Watershed)—Presently there isn't much development, but this area is expected to see significant industrial development in the near future.
7. Glendale and Areas North (Rose Run Watershed and East Rhudes Creek Watershed)—This area has potential for rapid development stemming from the anticipated industrial development. Off 31W soils get shallow and wet.
8. Oxmoor Village (East Rhudes Creek Watershed)—This area has potential for rapid development. Soils are shallow and wet.
9. New Glendale Road (East Rhudes Creek Watershed and Valley Creek Watershed)—This area has potential for rapid development. Brentwood, a new large development has 12 to 18 inches of soil. Other systems in the area are very shallow.
10. Thoroughbred Estates/Thousand Oaks (Middle Creek Branch Watershed)—Thoroughbred Estates is an older subdivision, and the soils are wet. Thousand Oaks has very shallow systems, 6- to 11-inches, with lots of failures.

11. Sonora (Dorsey Run Watershed)–Cherry View Estates has red clay soils. This area has lots of rock and sinkholes and is starting to experience some growth. Two package WWTPs are operable at this time. The new school (Creekside) has a peat moss treatment system.
12. Upton (Sandy Creek Watershed)–This area is in a similar situation to Sonora. There are a lot of sinkholes.
13. Septage Disposal (countywide)–consider centralized facility to accept and treat septage.

Medium Priority

1. Rineyville (Pawley Creek Watershed)–This area is not too bad. Areas along 1600 have very tight soils. There are currently more than 400 homes.
2. Hodgenville Road Area (Middle Creek Branch Watershed, East Rhudes Creek Watershed, and Upper Valley Creek Watershed)–Some growth in Mill Station. The soils in this area are not too bad, 12- to 24-inch systems.

Low Priority

1. Bardstown Road Area (Buffalo Creek Watershed)–This area has a restricted soils horizon (depth to bedrock is about 24 inches. The Bentcreek subdivision has about 200 homes and very shallow systems. The Huntington Ridge subdivision has okay soils. Systems right along Bardstown road are in worse condition. The Lincoln trail school has a sand filter system that is functioning. The lower Colesburg (along Hwy 434) area has tight soils and occasionally floods.
2. Springfield Road Area (Upper Younger Creek Watershed)–There is not much development in this area and no known problems.
3. Cecilia (West Rhudes Creek Watershed)–Presently, there is not much development in this area.
4. Colesburg (Lower Clear Creek Watershed)–out Bardstown Road–soils are good.
5. West Hardin/Lakewood Schools/Stephensburg Area (Lower Nolin River Watershed)–school systems are sufficient at this time; consider connection in the future.
6. Glendale Children’s Home (Nolin River Watershed)–Operable treatment plant. Low number of residents.
7. Landfill (Younger Creek Watershed)–has own treatment system. Consider elimination in the future.

3.09 AIR QUALITY

Based on the Air Quality Index, Hardin County experienced good air quality 81 percent of the time and moderate air quality 19 percent of the time in 2003. In 1999, the total emissions of all criteria air pollutants were 63,138 tons. In 1999, Hardin County was ranked 16th in the state of Kentucky for exposure to criteria air pollutants, but was not ranked in the top 16 counties for health risks from criteria air pollutants.

3.10 ENDANGERED AND NONENDANGERED PLANTS AND SPECIES

No significant impacts to the plant and animal communities are anticipated due to the implementation of wastewater collection and treatment system improvements. As of 2002, Hardin County hosted two species considered to be endangered. The first was the Gray Bat (*Myotis grisescens*) and the second was the Indiana Bat (*Myotis sodalist*). As of 2002, there were no plants found in Hardin County that were considered endangered.

3.11 HISTORICAL, ARCHITECTURAL, AND ARCHEOLOGICAL

Some of the culturally sensitive areas in Hardin County include Freeman Lake Park, the Brown-Pusey House, the Lincoln Heritage House, and the One-Room Schoolhouse. Others include the Fort Knox Military Reservation, Tioga Falls, Bridges to the Past (two historic walking trails), and Fort Duffield, which was occupied in the Civil War. No significant impacts to the historically, architecturally, or archeologically sensitive areas are anticipated due to the implementation of wastewater collection and treatment system improvements.

**SECTION 4
EXISTING WASTEWATER FACILITIES**

4.01 INTRODUCTION

There is currently no municipal wastewater collection or treatment infrastructure within the proposed Hardin County planning area. Existing municipal wastewater collection and treatment systems within the county were evaluated for adequate capacity to accept and treat county wastewater. This section describes the municipal wastewater collection systems of Elizabethtown, Vine Grove, Fort Knox, and Radcliff.

4.02 EXISTING MUNICIPAL COLLECTION SYSTEMS



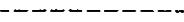


There are five municipal collection systems in Hardin County: West Point, Fort Knox, Radcliff, Vine Grove, and Elizabethtown. Due to its isolated location in the county, the West Point system will not be evaluated for accepting county wastewater. Pump stations and connection points to major intercepting sewers near the outer boundary of each treatment plant's service area may be critical in routing county wastewater through the collection systems to the existing plants. Wastewater routing options for areas of concern are described below.

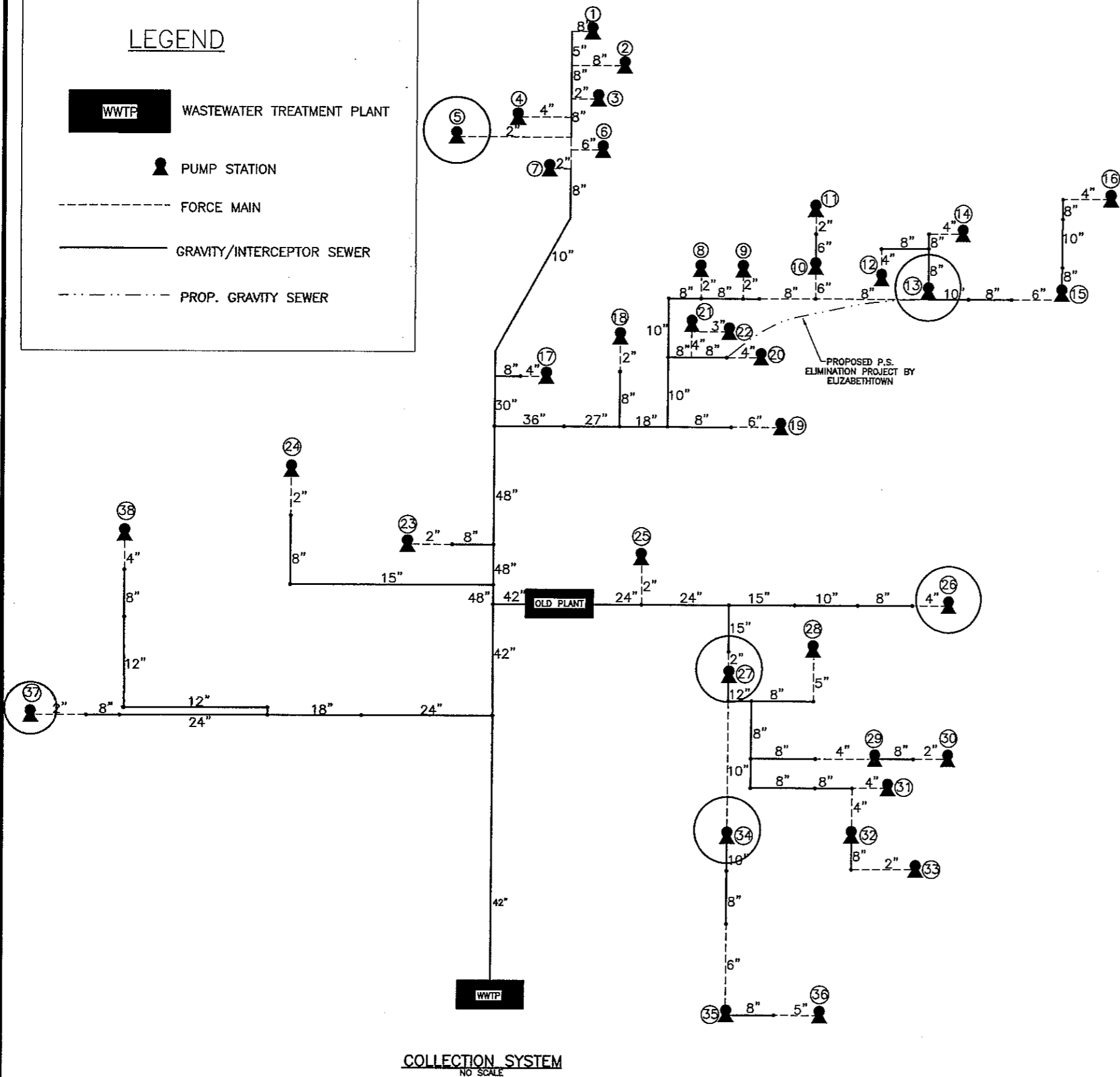
A. Elizabethtown, KY

There are 38 pump stations in the Elizabethtown collection system. Figure 4.02–1 is a schematic of the Elizabethtown collection system. The Upper Lake Road and Hawkins Drive pump stations may play a key role in routing county wastewater to the Elizabethtown WWTP. Currently, the City of Elizabethtown is considering a project to eliminate the Upper Lake Road pump station with a new gravity line around the lake. The Hawkins Drive station is capable of pumping at 1,500 GPM. Most of the Hodgenville Road (Middle Creek Branch Watershed, East Rhudes Creek Watershed, and Upper Valley Creek Watershed) area of concern, as well as the Thoroughbred Estates (Middle Creek Branch Watershed) area may be able to flow to this station by gravity. Other stations on the far west side of the city, the Airport Station, and the Briarwood Station may aid in serving areas of concern such as Rineyville (Pawley Creek Watershed) and LaVista Estates (Pawley Creek Watershed). Stations to the north such as Pine Valley and North Boundary Collector station may be used for Airview Estates (Mill Creek Branch Watershed) and Smithersville (Upper Shaw Creek Watershed). The Howell Court Station may be able to serve the Bardstown Road area (Buffalo Creek Watershed). Areas and package plants to the south may need to pump directly to the treatment plant. Table 4.02–1 summarizes possible routing options for potential areas of concern.

The City of Elizabethtown responded to a request for information on the acceptance of county wastewater into their collection system and WWTP. A copy of the April 18, 2006 letter is included in Appendix E. The city is willing and able to accept wastewater from county service areas, however, a capacity charge for conveyance and treatment would be charged to avoid any impact on city rate payers. In some cases, the county may have to deliver wastewater into the city to a point in the collection system that will avoid causing a capacity concern.

LEGEND

-  WASTEWATER TREATMENT PLANT
-  PUMP STATION
-  FORCE MAIN
-  GRAVITY/INTERCEPTOR SEWER
-  PROP. GRAVITY SEWER



PUMP STATION LIST

NO.	PUMP STATION	APPROX. CAP. (GPM)
①	STONE CREEK SUBDIVISION. SECTION 01	UNKNOWN GPM
②	STONE CREEK SUBDIVISION. SECTION 02	30 GPM
③	CHATSWORTH	80 GPM
④	SHADOW CREEK SUBDIVISION.	180 GPM
⑤	NORTH BOUNDARY COLLECTOR SUBDIVISION	UNKNOWN GPM
⑥	BEWLEY HOLLOW ROAD	370 GPM
⑦	PINE VALLEY	80 GPM
⑧	LES PINKHAM DEALERSHIP	80 GPM
⑨	HARDIN COUNTY SCHOOL BUS GARAGE	UNKNOWN GPM
⑩	NALL'S ROAD	80 GPM
⑪	FREEMAN LAKE #4	40 GPM
⑫	LAKE CREST APARTMENTS	350 GPM
⑬	UPPER LAKE RD.	1800 GPM
⑭	FOXBOUGH/SPRUCE LANE	260 GPM
⑮	FOXBFIRE	160 GPM
⑯	THE CEDARS	UNKNOWN GPM
⑰	DEEPWOOD/EDGE DR.	200 GPM
⑱	FIRE STATION #1	30 GPM
⑲	PEAR ORCHARD APARTMENTS	800 GPM
⑳	FREEMAN LAKE #1	350 GPM
㉑	FREEMAN LAKE #2	350 GPM
㉒	FREEMAN LAKE #3	108 GPM
㉓	GATESFIELD	40 GPM
㉔	GATES ROAD	80 GPM
㉕	NICHOLAS ST.	80 GPM
㉖	HOWELL CT.	550 GPM
㉗	EAST POPLAR ST.	100 GPM
㉘	SOUTH GATE SUBDIVISION	100 GPM
㉙	SKYLINE DR.	150 GPM
㉚	MOORE DR.	80 GPM
㉛	NEW GLENDALE RD.	120 GPM
㉜	BUSH LANE	220 GPM
㉝	MCCAMMISH DR.	50 GPM
㉞	HAWKINS DR.	1500 GPM
㉟	IVY POINT	400 GPM
㊱	SOUTH END COMMERCIAL SUBDIVISION	80 GPM
㊲	AIRPORT	80 GPM
㊳	BRIARWOOD	UNKNOWN GPM

NOTE: DATA PROVIDED BY ELIZABETHTOWN AND LTADD

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**ELIZABETHTOWN
COLLECTION SYSTEM SCHEMATIC**

HARDIN COUNTY WATER DISTRICT NO. 2
REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY, KENTUCKY



SHEET

FIGURE 4.02-1
JOB NO. 5-980.001

TABLE 4.02-1

AREAS OF CONCERN NEAR ELIZABETHTOWN, KY POTENTIAL PUMP SEQUENCE

Area of Concern	Potential Pump Sequence
Hodgenville Road (Middle Creek Branch, East Rhudes Creek, and Upper Valley Creek Watersheds)	Gravity--Hawkins PS (1500 GPM)--East Poplar (550 GPM)--Gravity--WWTP
Thoroughbred Estates (Middle Creek Branch Watershed)	Gravity--Hawkins PS (1500 GPM)--East Poplar (550 GPM)--Gravity--WWTP
Rineyville (Pawley Creek Watershed)	1. New PS--Gravity--WWTP 2. New PS--Airport (80 GPM)--Gravity--WWTP
LaVista Estates (Pawley Creek Watershed)	1. Gravity--Rineyville 2. New PS--Airport (80 GPM)--Gravity--WWTP
Airview Estates (Mill Creek Branch Watershed)	New PS--North Boundary (Unknown Capacity)-- Gravity--WWTP
Smithersville (Upper Shaw Creek Watershed)	New PS--Gravity--WWTP
Bardstown Road (Buffalo Creek Watershed)	Howell Court (550 GPM)--Gravity--WWTP
Cecilia (West Rhudes Creek Watershed)	New PS--Gravity--WWTP
Package Plants and Areas to South	New PS--WWTP

B. Radcliff, KY

There are 52 pump stations in the Radcliff collection system. See Figure 4.02–2 for a schematic of the Radcliff collection system. Several stations could play a critical role in serving the county. The 80 GPM Watkins station may be able to serve Airview Estates (Mill Creek Branch Watershed) and/or Smithersville (Upper Shaw Creek Watershed). That flow will need to go through several stations, most importantly, the 1,900 GPM Boone Trace Station. The Heartland Mobile Home package plant (Brushy Fork Creek Watershed) may be eliminated with the new 100 GPM Emmaus Court Station. The new 780 GPM Hwy 313 Station may be able to assist in serving the Deckard School Road/Burns Road area (Upper Otter Creek and Brushy Fork Creek Watersheds) as well as the Boone Road area (Upper Otter Creek Watershed). The Hwy 313 station pumps to Radcliff’s largest station, the 3,000 GPM Lincoln Trail Station. It is unlikely that any other areas of concern can be served by the Radcliff plant given the topography of the area. Table 4.02–2 summarizes potential areas of concern and possible routing options.

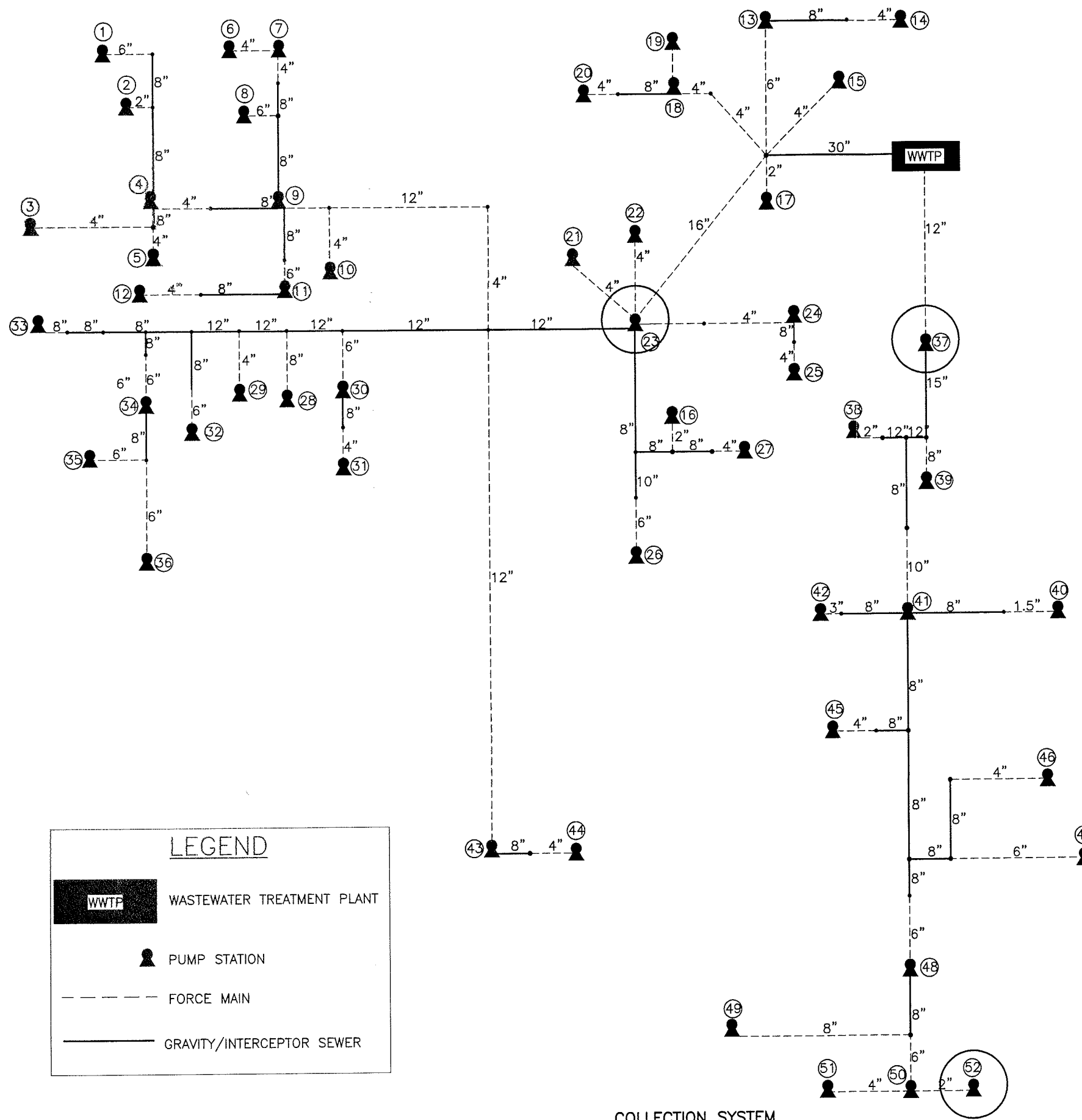
Areas of Concern	Potential Pump Sequence
Airview Estates (Mill Creek Branch Watershed) or Smithersville (Upper Shaw Creek Watershed)	New PS--Watkins PS (80 GPM)--John Hardin PS (250 GPM)--A Arnold PS (350 GPM)--Quiggins (960 GPM)--Boone Trace PS (1900 GPM)--WWTP
Heartland Mobile (Brushy Fork Creek Watershed)	Gravity--Emmaus PS (109 GPM)-- A Arnold PS (350 GPM)--Quiggins (960 GPM)--Boone Trace PS (1,900 GPM)--WWTP
Deckard School/Burns (Upper Otter Creek and Brushy Fork Creek Watersheds)	Gravity--Hwy 313 PS (780 GPM)--Lincoln Trail PS (3,000 GPM)--WWTP

Table 4.02-2 Areas of Concern Near Radcliff, KY Potential Pump Sequence

The City of Radcliff provided a letter dated February 9, 2006 that provides the conditions the city would require for accepting county wastewater. A copy of their letter is included in Appendix E. Radcliff would require that all county wastewater be pumped directly to their WWTP. The county wastewater would pass through separate headworks facilities (metering, screening, grit removal, odor control). The county would be responsible for paying for the headworks. Radcliff would also charge a hookup fee for county customers.

C. Vine Grove, KY

The Vine Grove WWTP is located at the lowest point in its watershed. Therefore, only three pump stations are needed in the collection system. Figure 4.02–3 is a schematic of the Vine Grove collection system. Only one pump station may play a role in serving the county. The Crume Road Pump Station only runs a few hours a day and its capacity is not known. Its location near the edge of Vine Grove may be of value to some areas of concern. Because the Vine Grove WWTP is located at the bottom of the watershed, Rineyville (Pawley Creek Watershed), LaVista Estates (Pawley Creek Watershed), Boone



LEGEND

- WASTEWATER TREATMENT PLANT
- PUMP STATION
- FORCE MAIN
- GRAVITY/INTERCEPTOR SEWER

PUMP STATION LIST		
NO.	PUMP STATION	APPROX. CAP. (GPM)
①	INDUSTRIAL PARK	250 GPM
②	SAFARI TRAIL	26 GPM
③	WENDOVER COURT	125 GPM
④	NORTH LOGSDON	200 GPM
⑤	RED HAWK	80 GPM
⑥	PARADISE #2	100 GPM
⑦	PARADISE #1	200 GPM
⑧	PEYTON PLACE	300 GPM
⑨	SEMINOLE	850 GPM
⑩	AUDUBON	125 GPM
⑪	HILLCREST	465 GPM
⑫	CYPRESS DRIVE	80 GPM
⑬	REDMAR BLVD	380 GPM
⑭	GLOBE	120 GPM
⑮	BROWN STREET	120 GPM
⑯	SWOPES	GRINDER
⑰	SPRING STREET EAST	37.5 GPM
⑱	DRUG STORE	200 GPM
⑲	WOODCREEK	100 GPM
⑳	ELM ROAD	75 GPM
㉑	CITY HALL	GRINDER
㉒	CLASSIC CARS	GRINDER
㉓	LINCOLN TRAIL	3000 GPM
㉔	HENSLEYS	130 GPM
㉕	INDIANA TRAIL	125 GPM
㉖	CEMENT	250 GPM
㉗	LOGAN	80 GPM
㉘	CHURCH (METHODIST)	125 GPM
㉙	DOCS	120 GPM
㉚	KINDERGARTEN	150 GPM
㉛	CROCUS DRIVE (WEST)	75 GPM
㉜	MARVINS	200 GPM
㉝	CHRISTOPHER SQUARE	550 GPM
㉞	GREENVIEW LANE	400 GPM
㉟	MAPLE FOREST	200 GPM
㊱	STOVALL	290 GPM
㊲	BOONE TRACE	1900 GPM
㊳	SHERWOOD	40 GPM
㊴	OAK DRIVE (HEARDS)	400 GPM
㊵	CONROE DRIVE	20 GPM
㊶	QUIGGINS	960 GPM
㊷	SKYLARK DRIVE	37.5 GPM
㊸	HWY 313	780 GPM
㊹	MASTER STREET	80 GPM
㊺	BYERLY BOULEVARD	95 GPM
㊻	DEER HAVEN	80 GPM
㊼	BATTLE TRAINING ROAD	250 GPM
㊽	A ARNOLD & SONS	350 GPM
㊾	EMAUS	109 GPM
㊿	JOHN HARDIN	250 GPM
51	APPLE WOOD	110 GPM
52	WATKINS	80 GPM

COLLECTION SYSTEM
NO SCALE

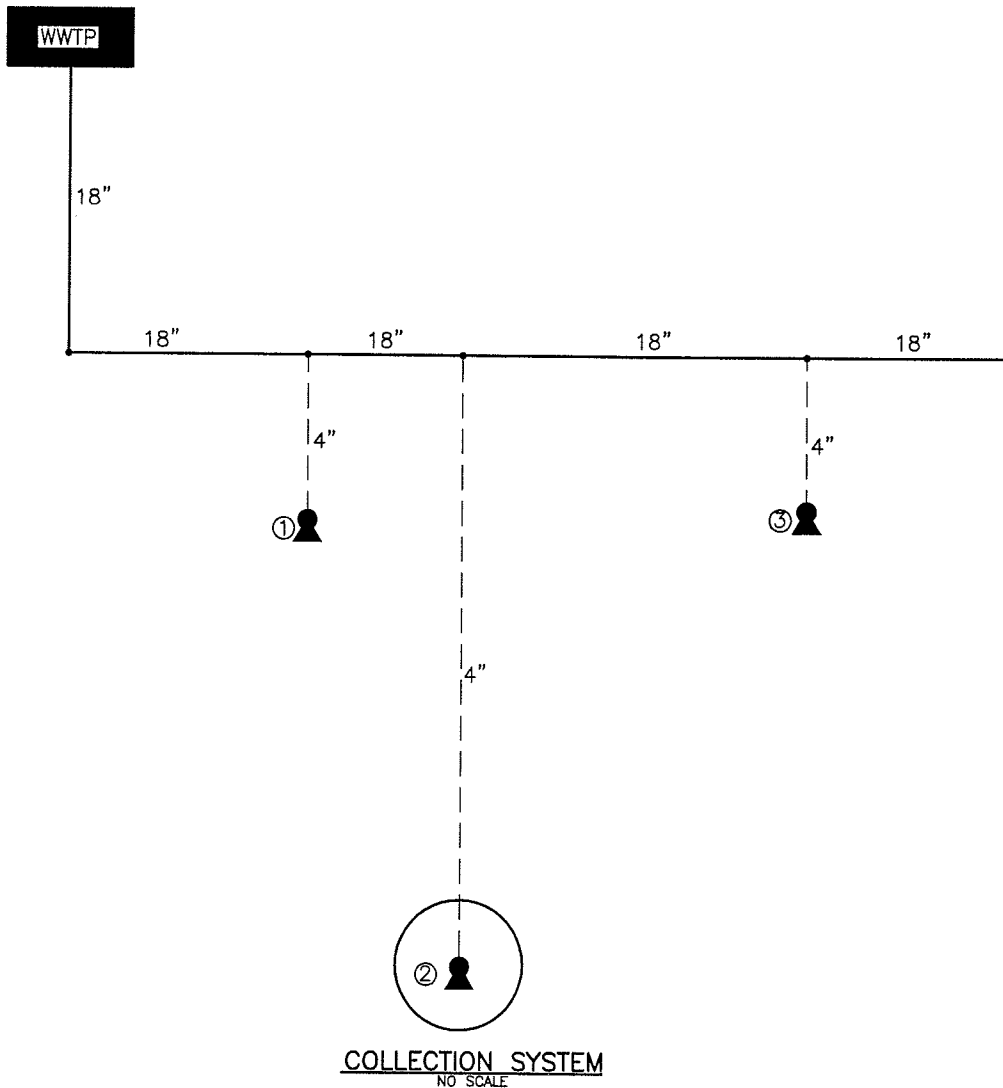
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RADCLIFF
COLLECTION SYSTEM SCHEMATIC
HARDIN COUNTY WATER DISTRICT NO. 2
REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY, KENTUCKY




SHEET
FIGURE 4.02-2
JOB NO. 5-980.001





PUMP STATION LIST		
NO.	PUMP STATION	APPROX. CAP. (GPM)
①	TWIN CREEKS	UNKNOWN
②	CRUME ROAD	UNKNOWN
③	WALNUT STREET	UNKNOWN


NOTE: DATA PROVIDED BY VINE GROVE AND LTADD

LEGEND

 WASTEWATER TREATMENT PLANT

 PUMP STATION

 FORCE MAIN

 GRAVITY/INTERCEPTOR SEWER

**VINE GROVE
COLLECTION SYSTEM SCHEMATIC**

**HARDIN COUNTY WATER DISTRICT NO. 2
REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY, KENTUCKY**



FIGURE 4.02-3

5-980.001

Road (Upper Otter Creek Watershed), and parts of the Deckard School Road (Upper Otter Creek and Brushy Fork Creek Watersheds) areas may actually be able to flow all the way to the plant by gravity. It is unlikely that any other areas of concern can be served by the Vine Grove WWTP. Table 4.02–3 summarizes potential areas of concern and possible routing options.

Area of Concern	Potential Pump Sequence
Rineyville (Pawley Creek Watershed)	Gravity--Crume Road PS--Gravity--WWTP
LaVista Estates (Pawley Creek Watershed)	Gravity--Rineyville
Deckard School/Burns (Upper Otter Creek and Brushy Fork Creek Watersheds)	Gravity--Crume Road PS--Gravity--WWTP
Boone Road (Upper Otter Creek Watershed)	Gravity--Burns Road

Table 4.02-3 Areas of Concern Near Vine Grove, KY Potential Pump Sequence

The City of Vine Grove provided a letter dated May 4, 2006 that discusses their ability to accept county wastewater. A copy of the letter is included in Appendix E. Vine Grove is unable to accept any additional wastewater from the county without expanding their WWTP. The county would be required to pay the cost of expansion of the WWTP and deliver wastewater directly to their facility.

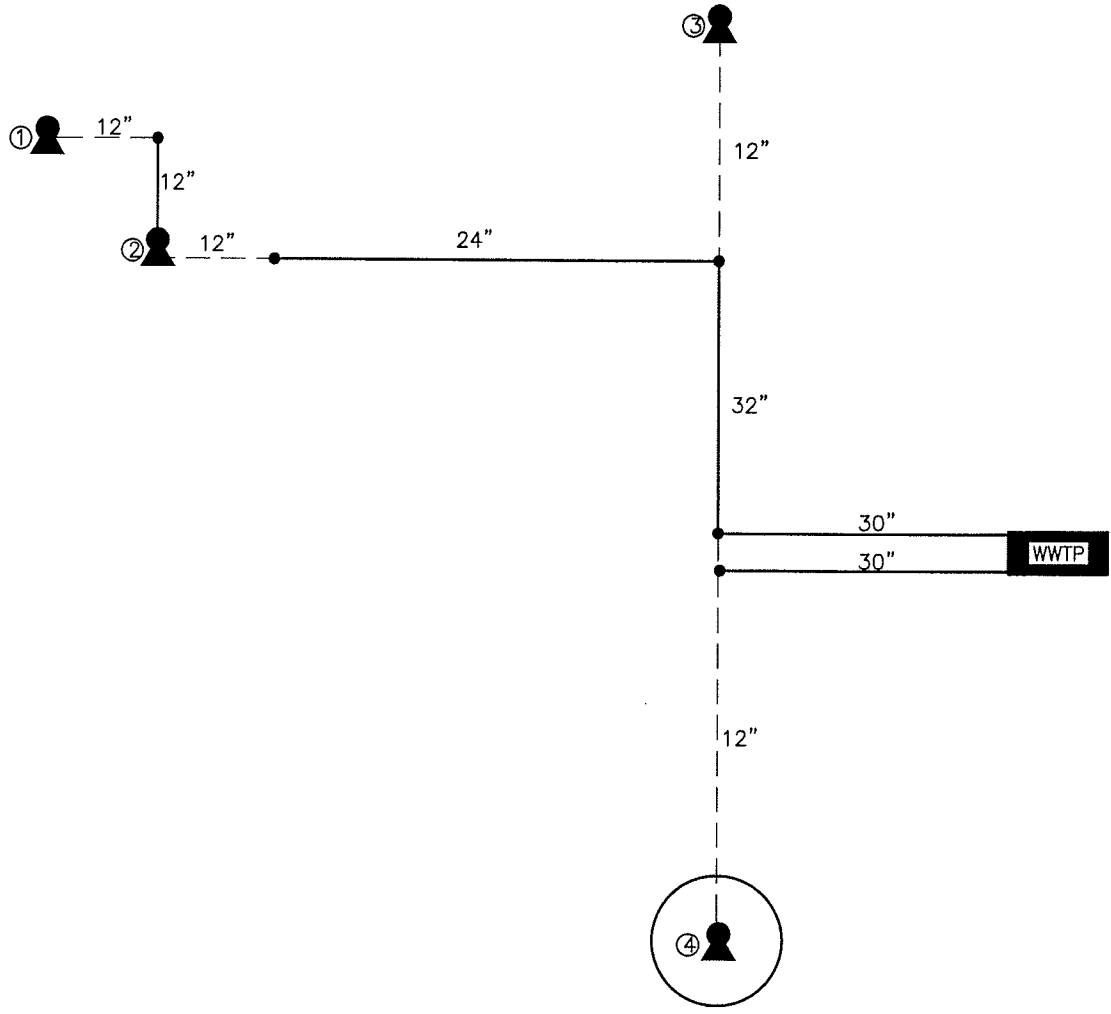
D. Fort Knox

The Fort Knox collection system has four primary pump stations. See Figure 4.02-4 for a schematic of the Fort Knox collection system. The station closest to Radcliff, KY, and most likely to be used in conveying county flow, is a 450 GPM pump station near the Wilson Road entrance. Other pump stations, including the 2,800 GPM Chaffee/Gold Vault station, are probably too far north to be effectively used in any county wastewater conveyance alternatives. A new pump station with force main all the way to the plant may be necessary to convey county wastewater to the WWTP. Table 4.02-4 summarizes potential areas of concern and possible routing options.

Area of Concern	Potential Pump Sequence
Any Area	1. New PS--WWTP 2. New PS--Wilson Road PS (450 GPM)--Gravity--WWTP

Table 4.02-4 Areas of Concern Near Fort Knox, KY Potential Pump Sequence

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FLOW SCHEMATIC
NO SCALE

LEGEND

WASTEWATER TREATMENT PLANT

PRIMARY PUMP STATION

FORCE MAIN

GRAVITY/INTERCEPTOR SEWER

PUMP STATION LIST

NO.	PUMP STATION	APPROX. CAP. (GPM)
①	AIR FIELD	1200 GPM
②	CHAFFEE	2800 GPM
③	VAN VOORHIS HOUSING	800 GPM
④	WILSON ROAD ENTRANCE	450 GPM

NOTE: DATA PROVIDED BY FT. KNOX

**FORT KNOX
COLLECTION SYSTEM SCHEMATIC**

**HARDIN COUNTY WATER DISTRICT NO. 2
REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY, KENTUCKY**



FIGURE 4.02-4
5-980.001

The Fort Knox collection and treatment system is operated by Hardin County Water District No. 1 (HCWD1). A copy of their December 29, 2005 letter is included in Appendix E. HCWD1 noted county wastewater can be delivered to one of two points in the collection system. The county would be expected to share in the cost to upgrade the Fort Knox collection system. No modifications are expected to be made at the Fort Knox WWTP.

E. Caveland Environmental Authority

Caveland Environmental Authority (CEA) operates wastewater collection systems in Hart and Barren counties. In previous planning conducted by CEA, provisions were made to accept up to 180 GPM of wastewater from Upton to the Bonnieville service area. Wastewater would be pumped from that location to the Horse Cave WWTP for treatment.

A copy of e-mail correspondence with CEA and their consulting engineers is included in Appendix E.

4.03 EXISTING TREATMENT FACILITIES

Based on a search of USEPA and KDOW records, a total of five municipal WWTPs and 11 private or 'package' WWTPs were identified. Table 4.03-1 lists the rated capacities and the reported utilization (average daily flow from April 2002 to March 2003). More information on the utilization and capacity of each municipal WWTP is provided below.

4.04 DESCRIPTION OF EXISTING MUNICIPAL TREATMENT FACILITIES

The following sections give a general overview of the WWTPs operated by Elizabethtown, KY, Radcliff, KY, Vine Grove, KY, and Fort Knox, KY. An accompanying schematic will illustrate the treatment process at each WWTP. These WWTPs were considered in the municipal wastewater treatment alternatives in the planning area.

A. Elizabethtown, KY

The Elizabethtown WWTP, located southwest of downtown on Gaither Station Road, has a capacity of 7.2 MGD. It uses an oxidation ditch (extended aeration, activated sludge) process. A schematic of the process is shown in Figure 4.04-1.

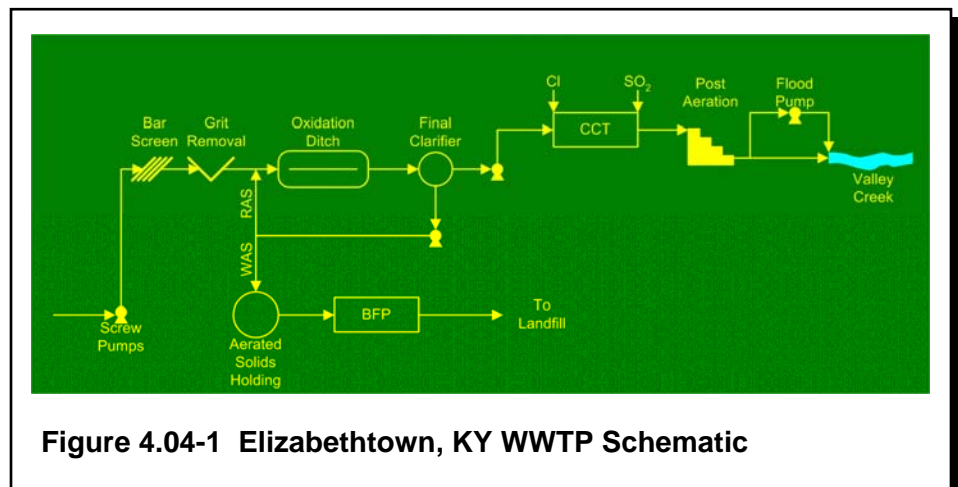


TABLE 4.03-1

LIST OF WWTPS, RATED CAPACITY, AND REPORTED UTILIZATION

WWTP Name	Type	Rated Capacity (mgd)	Average Flow (4/02 - 3/03) (mgd)	Percent of Capacity
Elizabethtown	Municipal	7.2	6.18	86
Fort Knox	Municipal	6.0	2.0	33
Radcliff	Municipal	4.0	2.34	59
Vine Grove	Municipal	0.714	0.30	41
West Point	Municipal	0.20	0.11	53
Airview Estates Subdivision	Private	0.055	0.032	58
Glendale Children's Home	Private	0.022	0.010	45
Glendale Auto Truck Plaza	Private	0.015	0.006	40
Hardin County Board of Education Outfall 001	Private	0.012	0.005	25
Hardin County Board of Education Outfall 002	Private	0.012	0.004	33
Heartland Mobile Home Community	Private	0.007	0.004	57
KTC Hardin Co Rest Area I-65 Outfall 001	Private	0.02	0.009	45
KTC Hardin Co Rest Area I-65 Outfall 002	Private	0.02	0.01	50
Petro Shopping Centers	Private	0.06	0.036	60
Sonora Auto Truck Plaza Outfall 001	Private	Unknown	0.001	Unknown
Sonora Auto Truck Plaza Outfall 002	Private	Unknown	0.001	Unknown

The plant flow currently averages 6.18 MGD with 1.0 MGD available for growth within the city and for county wastewater. The city is currently evaluating a potential expansion to their WWTP. Dewatered sludge from the plant is hauled to the Pearl Hollow landfill.

B. Radcliff, KY WWTP

The Radcliff WWTP, located between Radcliff and Fort Knox, KY, has a capacity of 4.0 MGD. More specifically, it is located on East New Street just North of Lincoln Trail Boulevard. Similar to the Elizabethtown, KY Plant, the Radcliff WWTP also uses an oxidation ditch process. The Radcliff plant includes a new screening process at the headworks and a UV system for disinfection. A schematic of the process is shown in Figure 4.04-2. Currently, the plant receives an average of 2.35 MGD with 1.65 MGD available for growth within the city and for county wastewater. Due to the WWTP location, pump stations will play a key role in conveying county wastewater to Radcliff, KY. Dewatered sludge from the plant is currently hauled to the Outer Loop landfill.

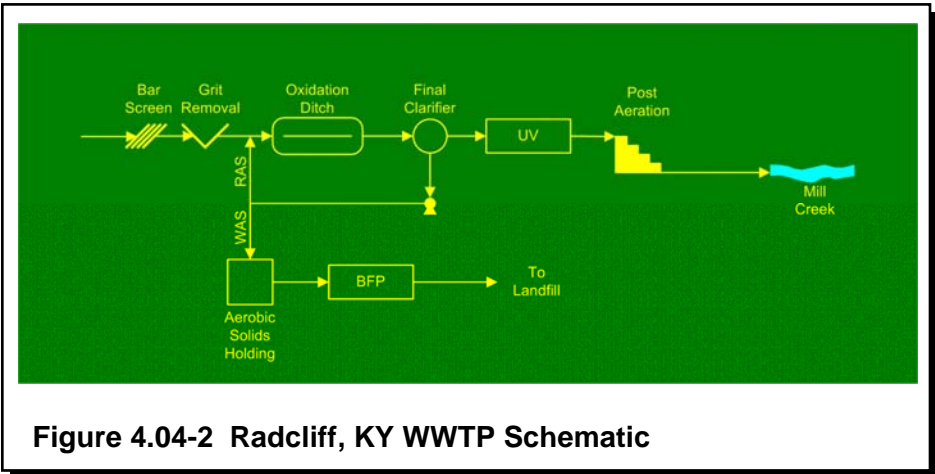


Figure 4.04-2 Radcliff, KY WWTP Schematic

Due to the WWTP location, pump stations will play a key role in conveying county wastewater to Radcliff, KY. Dewatered sludge from the plant is currently hauled to the Outer Loop landfill.

C. Vine Grove, KY WWTP

The 0.71 MGD treatment plant in Vine Grove is located on Ditto Lane where Otter Creek exits Hardin County. Vine Grove has one oxidation ditch and two final clarifiers, though only one is currently used. A schematic of the process is shown in Figure 4.04-3. The plant operates at 0.34 MGD, and while it has 0.37 MGD reserve capacity, renovations to the plant would likely be needed if it

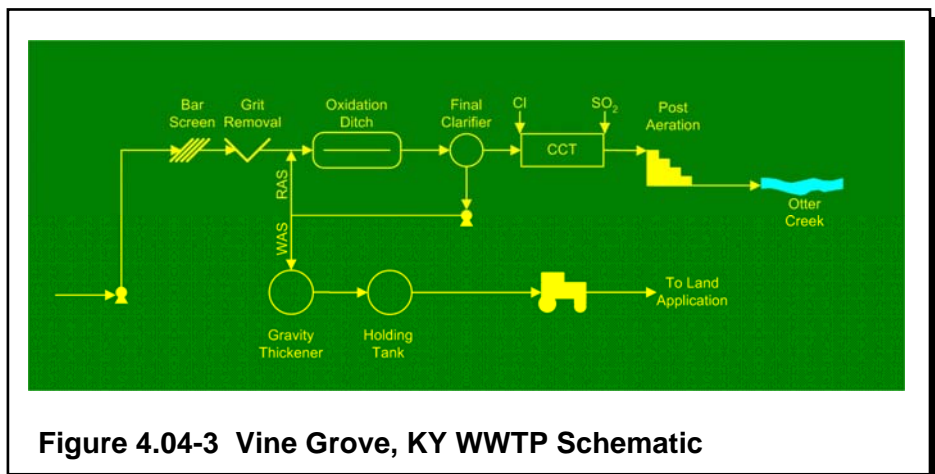


Figure 4.04-3 Vine Grove, KY WWTP Schematic

accepted a significant amount of county flow. The influent pump station can handle a maximum of 3.8 MGD, but it still overflows approximately once a year. Liquid sludge from the plant is land-applied at a land farm adjacent to the plant owned by the city.

D. Fort Knox, KY WWTP

The Fort Knox WWTP has a large amount of excess capacity, and it may be more affordable to pump to Fort Knox than to substantially upgrade a closer plant. The 6.0 MGD plant is located about 3 miles north of the Radcliff Plant along Mill Creek. A schematic of the process is shown in Figure 4.04-4. Currently, only half of the plant is being used to treat approximately 2.0 MGD. As of July 1, 2005, Fort Knox privatized their plant with operational responsibilities going to Hardin County Water District No. 1 (HCWD1). According to discussions with Fort Knox personnel, the US government will remain a co-permittee on the discharge permit after HCWD1 takes over. The Fort Knox discharge permit contains a limit on the concentration of mercury that can be discharged. The facility has struggled to meet this effluent limitation and the contamination in Mill Creek, which classifies it as an “Impaired Stream”, has been attributed to the Fort Knox WWTP. Taking additional wastewater from off the base could potentially lower the mercury concentration of the effluent. Dewatered sludge from the plant is currently hauled to the Outer Loop landfill.

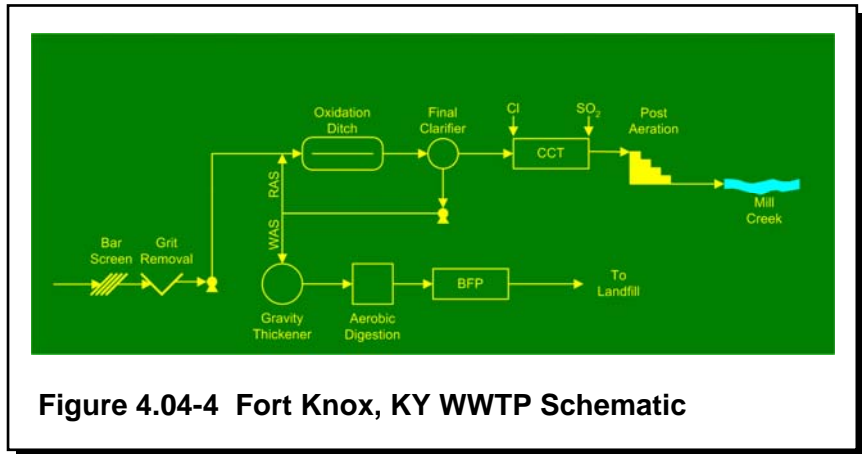


Figure 4.04-4 Fort Knox, KY WWTP Schematic

4.05 TREATMENT PLANT PERFORMANCE

Tables 4.05-1, 2, 3, and 4 illustrate the KPDES permit limits and performance for the WWTPs at Elizabethtown, Radcliff, Vine Grove, and Fort Knox, respectively.

	Influent	Effluent	Capacity/Permit Limit
Flow, MGD	N/A	5.91	7.2
BOD, mg/L	154	5	10
TSS, mg/L	278	11	30
NH ₃ -N, mg/L	9.88	0.23	2
*2004 Average Data			
KPDES Permit 22039, Issued January 1, 1999; Expired December 31, 2004			

Table 4.05-1 Elizabethtown, KY Plant Performance

	Influent	Effluent	Capacity/Permit Limit
Flow, MGD	N/A	2.35	4.0
BOD, mg/L	206	5	10
TSS, mg/L	239	4	30
NH ₃ -N, mg/L	18.31	0.41	2
*2004 Average Data KPDES Permit 22390, Issued April 1, 2003; Expires February 29, 2008			
Table 4.05-2 Radcliff, KY Plant Performance			

	Influent	Effluent	Capacity/Permit Limit
Flow, MGD	N/A	0.34	0.7145
BOD, mg/L	231	4	20
TSS, mg/L	149	5	30
NH ₃ -N, mg/L	23	0.22	4
*2004 Average Data KPDES Permit 24988, Issued October 1, 2003; Expires March 31, 2008			
Table 4.05-3 Vine Grove, KY Plant Performance			

	Influent	Effluent	Capacity/Permit Limit
Flow, MGD	unknown	2	6
BOD, mg/L	unknown	5	15
TSS, mg/L	unknown	10	30
NH ₃ -N, mg/l	unknown	0.2	2
*Average Data Provided by Fort Knox KPDES Permit 2917, Issued December 1, 2004; Expires February 29, 2008			
Table 4.05-4 Fort Knox, KY Plant Performance			

4.06 TREATMENT PLANT PERSONNEL

Data on the existing municipal treatment plant personnel was not collected for this study.

4.07 INDUSTRIAL DISCHARGE

Industry does not presently exist within the Hardin County planning area, although it is anticipated that industry will be developed at the Glendale Industrial tract. Significant industrial flow may be expected from this area after it is developed.

4.08 EXISTING COLLECTION SYSTEM OPERATING DEFICIENCIES

A. Collection System

Hardin County Water District No. 2 does not currently own or operate any municipal wastewater infrastructure. As such, the existing collection systems of the municipalities were not evaluated other than for adequate capacity to accept county wastewater. Data on municipal collection system deficiencies was not obtained. Collection system operating deficiencies could be obtained from the municipal entities listed in this plan, if necessary.

B. Pumping Stations

Pumping stations near areas of concern were evaluated only for capacity to accept county wastewater flow, if necessary. Data on operating deficiencies of the pump stations was not obtained for this plan. Pump station operating deficiency data could be obtained from the municipal entities listed in this plan, if necessary.

4.09 EXISTING TREATMENT PLANT OPERATING DEFICIENCIES

Hardin County Water District No. 2 does not currently own any municipal WWTPs. As such, the existing municipal WWTPs were not evaluated other than for adequate capacity to accept county wastewater. Data on municipal WWTP operating deficiencies was not obtained. WWTP operating deficiencies could be obtained from the municipal entities listed in this plan, if necessary.

4.10 INFILTRATION AND INFLOW

Hardin County Water District No. 2 does not currently own any municipal wastewater infrastructure. Infiltration and inflow information (I/I) was not collected for the municipal collection systems. As the county begins to develop wastewater infrastructure, I/I may need to be addressed in the future.

4.11 BYPASSES AND OVERFLOWS

Hardin County Water District No. 2 does not currently own any municipal wastewater infrastructure. Data on existing bypasses and overflows in the municipal collection systems was not collected for this study. This data could be obtained from the municipal entities listed in this plan, if necessary.

SECTION 5
DEMOGRAPHICS AND LAND USES

5.01 INTRODUCTION

This section will describe the demographics and land use in the planning area defined in Section 2 of this report. Demographic information will be based on data supplied by the University of Louisville Center for Population Research, the Kentucky State Data Center (KSDC), and the Lincoln Trail Area Development District (LTADD).

5.02 POPULATION DATA

A. Historical Population

Using census data from the University of Louisville Center for Population Research and the Kentucky State Data Center, past population history for Hardin County can be summarized. From 1900 to 1930, the county experienced fluctuations in population. From 1940 to 1980, a sharp increase in population was noted, and from 1980 to 2000, the population remained fairly stable. Historical data is presented graphically in Figure 5.02-1 and detailed data is given in Table 5.02-1.

Table 5.02-2 provides a breakdown of the Hardin County population based on the 2000 Census provided by the United States Census Bureau.

This information shows that slightly less than two thirds of the county population lives in cities with the majority residing in Elizabethtown, KY and Radcliff, KY. Slightly more than one third of the Hardin County population resides in rural areas.

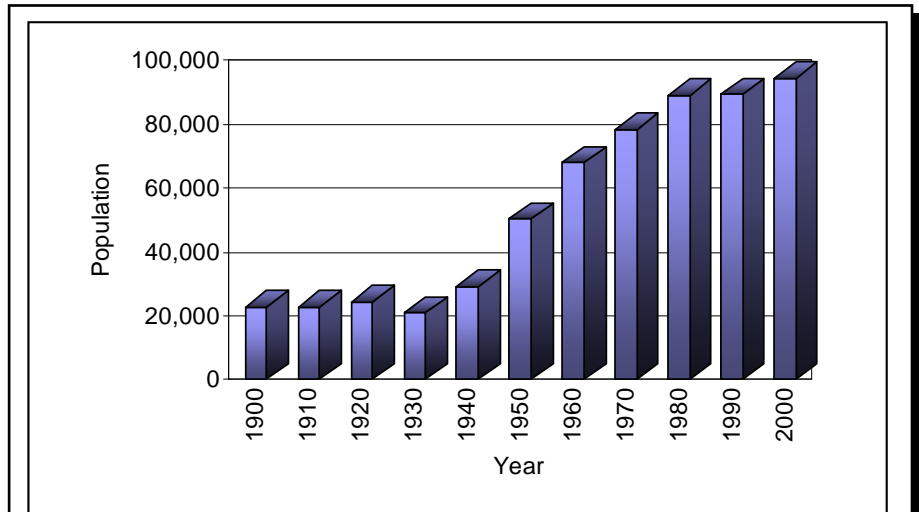


Figure 5.02-1 Hardin County Historical Census Population

Year	Population	Percent Increase
1900	22,937	
1910	22,696	(1.05)*
1920	24,287	7.01
1930	20,913	(13.89)*
1940	29,108	39.19
1950	50,312	72.85
1960	67,789	34.74
1970	78,421	15.68
1980	88,917	13.38
1990	89,240	0.36
2000	94,174	5.53

*Indicates a negative value.

Table 5.02-1 Hardin County Historical Census Population

Area	2000 Census Population
Elizabethtown, KY	22,542
Fort Knox, KY	9,294
Radcliff, KY	21,961
Sonora, KY	350
Upton, KY	391
Vine Grove, KY	4,169
West Point, KY	1,100
Rural-Hardin County	34,367
Total-Hardin County	94,174

Table 5.02-2 Census Population Breakdowns for Hardin County

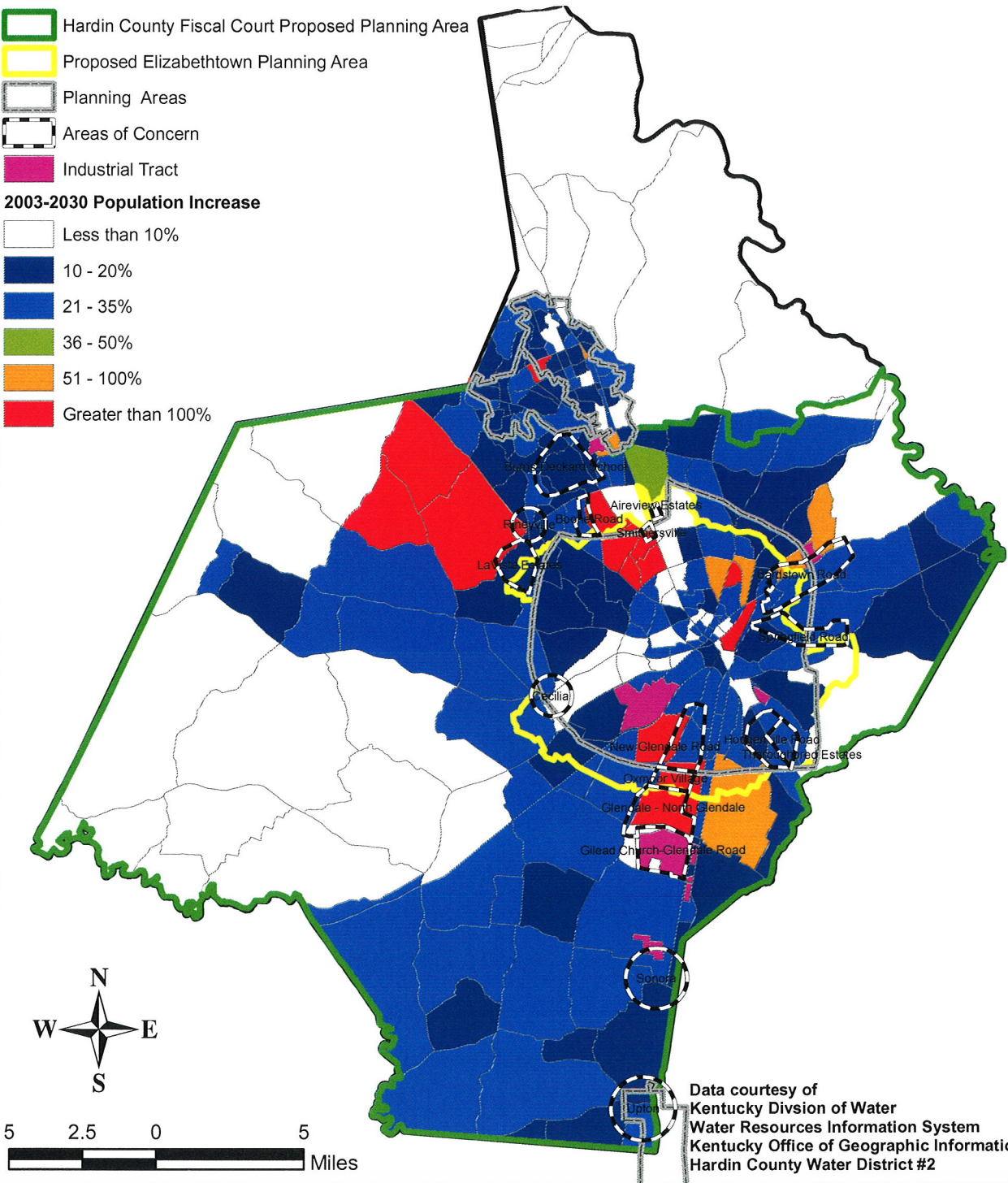
A. Projected Population

To aid in the adequate planning and possible addition of county wastewater collection and treatment facilities, it is necessary to have an understanding of future system needs based on population. Projections of growth rate are difficult to predict with a high degree of accuracy. Projections, however, do provide a rational basis for estimating probable short- or long-term trends. Continual monitoring by local planning authorities of actual growth in the community compared with the projected growth for medium term (five-year) periods will allow adjustment of facility expansion programs to account for variations that may occur because of unforeseen circumstances.

Historic and projected population data from the Kentucky State Data Center indicate that the overall population growth rate in Hardin County from 2000 to 2030 is expected to be 29 percent. Subsequent investigations by the LTADD indicate that most of the growth is projected to occur in the rural parts of the county. The LTADD divided the county into 254 population zones based on census blocks. Zones within the Vine Grove planning area are predicted to have a 20 percent growth. The Radcliff planning area has a predicted growth rate of 18 percent. The Elizabethtown planning area is predicted to have a 29 percent growth rate. All the remaining county zones are projected to grow by 39 percent. Both Vine Grove and Radcliff have planning areas that are similar to their city limits. However, Elizabethtown’s planning area is significantly larger than its current city limits. The zones within the Elizabethtown city limits are projected to grow 21 percent, while the remaining area between the Elizabethtown city limits and its planning area boundary is projected to grow at 67 percent. If the area between the Elizabethtown city limits and its current planning boundary is consolidated with the county zones, the net growth in the county would be 44 percent. Table 5.02-3 and Figure 5.02-3 illustrate the zone specific growth as determined by the LTADD.

Legend

- Hardin County Fiscal Court Proposed Planning Area
 - Proposed Elizabethtown Planning Area
 - Planning Areas
 - Areas of Concern
 - Industrial Tract
- 2003-2030 Population Increase**
- Less than 10%
 - 10 - 20%
 - 21 - 35%
 - 36 - 50%
 - 51 - 100%
 - Greater than 100%



LTADD ZONE SPECIFIC GROWTH BY PERCENT

REGIONAL WASTERWATER FACILITIES PLAN

**HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



**FIGURE 5.02-3
5-980-001**

Area	Population 2003	Population 2030	Population Change	Percentage of Population Growth
Vine Grove Planning	4,619	5,543	924	20%
Radcliff Planning	21,382	25,263	3,881	18%
Elizabethtown Planning	30,382	39,324	8,942	29%
Elizabethtown City	24,699	29,845	5,146	21%
Elizabethtown Remainder	5,683	9,479	3,796	67%
County minus Planning Areas	31,781	44,303	12,522	39%
County with Elizabethtown Remainder	37,464	53,782	16,318	44%

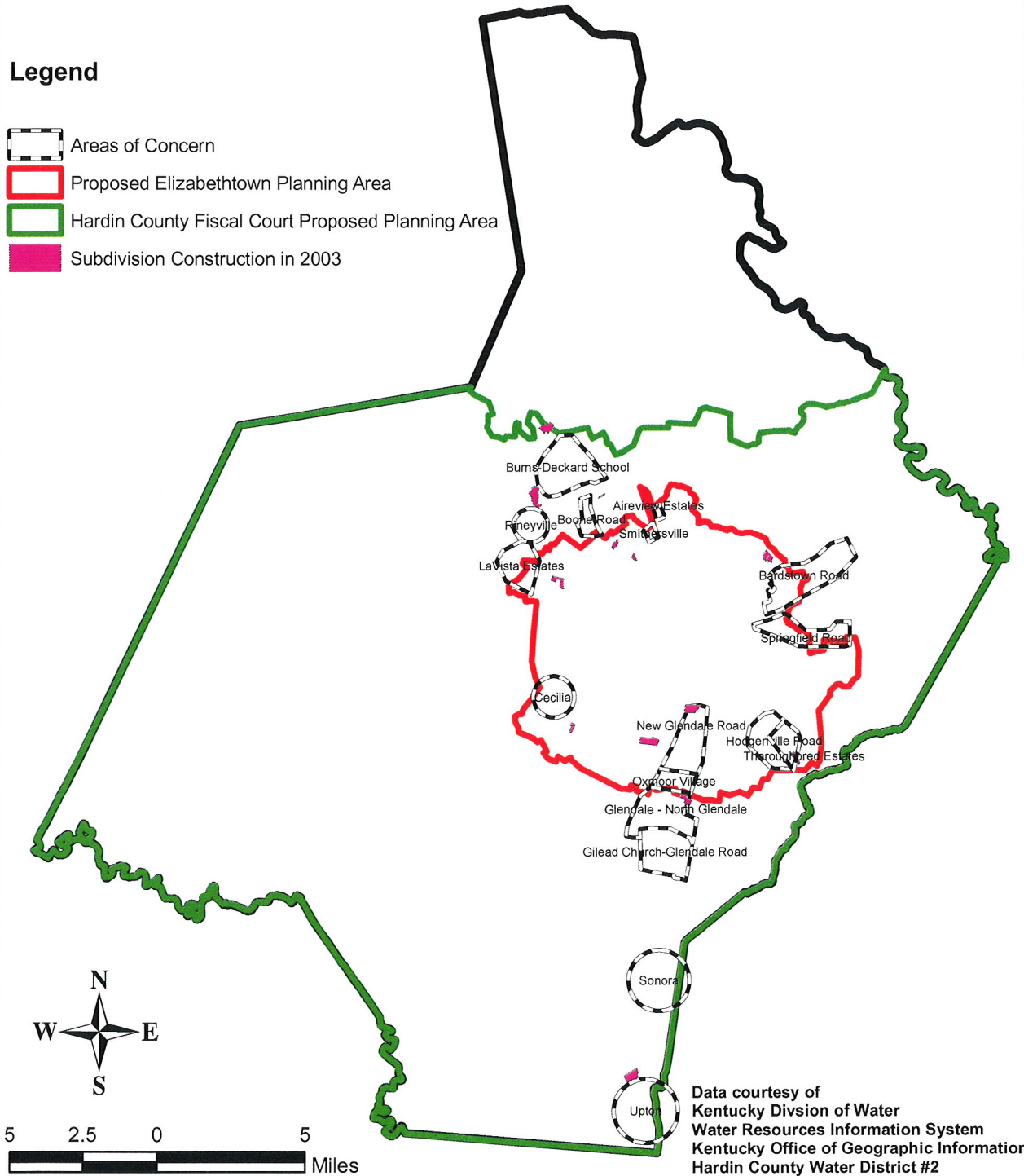
Table 5.02-3 Zone Specific Growth by LTADD

The Hardin County population is projected to increase by about 27,673 people during the period from 2000 through 2030. This implies year 2000 population of 94,174 will increase to an estimated 121,847 by year 2030. The KSDC provides data for projections of household population, number of households, and the population per household. Estimating population per household helps quantify future wastewater project flows based on a per capita per day usage. The population per household in Hardin County has declined from 1990 to 2000 from 2.78 to 2.62. This data indicates a decreasing trend creating population per household projections of 2.58 in 2005, 2.53 in 2010, and 2.51 for the years from 2015 to 2030. These estimates will be utilized in estimating flow projections in subsequent sections of this report.

In addition to population projection studies, construction data was also examined to determine growth. Figure 5.02-4 shows the 13 subdivisions actively under construction in 2003. With a total of 423 homes proposed, the 13 developments are very close to either an area of concern or a growth zone. Eight of the 13 developments are within the Elizabethtown Planning area, but outside the city limits. Subdivision development inside the city limits of Elizabethtown, Radcliff, or Vine Grove was not obtained. However, historical data may indicate a trend in the county. Over 6,000 lots have been approved for development since 1990. According to the Hardin County Planning and Development Commission, nearly 70 percent of lots since 2000 have been approved in the Rural Residential Sector, which is defined as the areas of Hardin County not in one of the three planning areas. Additionally, over 1,700 permits were issued by Hardin County for single family dwellings since the year 2000. Converting these permits to actual population using 2.5 people per home reveals a much stronger growth rate than indicated by KSDC or LTADD.

Legend

-  Areas of Concern
-  Proposed Elizabethtown Planning Area
-  Hardin County Fiscal Court Proposed Planning Area
-  Subdivision Construction in 2003



Data courtesy of
 Kentucky Division of Water
 Water Resources Information System
 Kentucky Office of Geographic Information
 Hardin County Water District #2

ACTIVE SUBDIVISION CONSTRUCTION IN 2003

REGIONAL WASTEWATER FACILITIES PLAN

HARDIN COUNTY WATER DISTRICT NO. 2
 HARDIN COUNTY, KENTUCKY



FIGURE 5.02-4
 5-980-001

A comparison of building permits is summarized in Table 5.02-4.

Area	2002	2003	2004
Vine Grove	76	13	25
Radcliff	53	75	79
Elizabethtown	109	118	159
County Less Planning Areas	368	429	399
Total County	606	635	662
Population (2.5 people per home)	1,515	1,587	1,655
KSDC Predicted Population Increase	756	756	756

Table 5.02-4 Building Permit Summary by Hardin County Planning and Development Commission

Table 5.02-5 also illustrates strong county growth through lots platted and building permits.

Year	County Lots Platted	County House Starts	City House Starts
2000	735	232	277
2001	745	315	277
2002	479	368	238
2003	741	429	216
2004	566	399	263

Table 5.02-5 Lots and Permits Summary by Hardin County Planning and Development Commission

A detailed discussion of population based on service areas and areas of concern will be provided in Section 6. The preceding data justifies very strong growth and use of more aggressive projections than data provided by KSDC.

In addition to the documented growth in the county, another factor that will serve to sustain or even accelerate growth is the Base Realignment and Closure (BRAC) that is affecting the Fort Knox Military Reservation. Ultimately, because of BRAC, more of the assigned personnel to Fort Knox will live off base rather than on base.

5.03 LAND USE

A. Existing Land Use

A land use map for Hardin County currently does not exist.

B. Future Land Use

In order to predict future wastewater generation, an assessment of future land use is necessary. New residential development is anticipated to occur throughout the county. In addition, 11 sites which amount to nearly 4,000 acres of land are expected to host industrial development.

SECTION 6
WASTELOAD AND FLOW FORECASTS

6.01 INTRODUCTION

To plan for adequate capacity of the wastewater collection and treatment facilities, a rate of population growth and associated sewer system flows will be assumed as a starting point for planning future system needs. Resources used to estimate population and potential growth rates in the planning area include publications from the University of Louisville Center for Population Research, the Kentucky State Data Center, and the Lincoln Trail Area Development District (LTADD), and the recent development data provided by Hardin County Planning and Development as discussed in Section 5.

6.02 EXISTING SERVICE AREA POPULATION

For this RWWFP, areas in Hardin County not currently receiving public sanitary sewer service were divided into five service areas as shown in Figures 6.02-1 through 6.02-5. These service areas were further divided into a total of 31 sub watersheds that encompass the “areas of concern” and were identified as either an “urban area” or “near urban area.” The watersheds defined as “urban areas” were identified to have the most immediate need for wastewater collection and are considered to require service by Design Year 2017 (Year 10). Watersheds defined as “near urban areas” were identified to have future wastewater collection needs and are considered to require service by Design Year 2027 (Year 20). Since the initiation of this RWWFP, the city of Elizabethtown has accepted 10 of these watersheds and one service area (Valley Creek Service Area) into its revised planning area. Table 6.02-1 illustrates the existing service area populations.

Service Area	2003 Population
<i>Northern Service Area</i>	
Urban Area	7,510
Near Urban Area	2,500
<i>Southern Service Area</i>	
Urban Area	660
Near Urban Area	1,850
<i>Eastern Service Area</i>	
Urban Area	830
Near Urban Area	3,090
<i>Upton and Sonora Service Area</i>	810

Table 6.02-1 Service Area Populations (2003)

Table 6.02-2 illustrates the watersheds accepted into the City of Elizabethtown’s updated planning area. Population projections and wastewater collection and treatment alternatives were developed for these watersheds. These are included in Appendix F.








Public sanitary sewer systems currently exist in Elizabethtown, Radcliff, Vine Grove, West Point, and Fort Knox, KY. The Hardin County Fiscal Court planning area include remaining areas of the county not currently served by public sanitary sewer systems and not currently within a regional wastewater planning area.

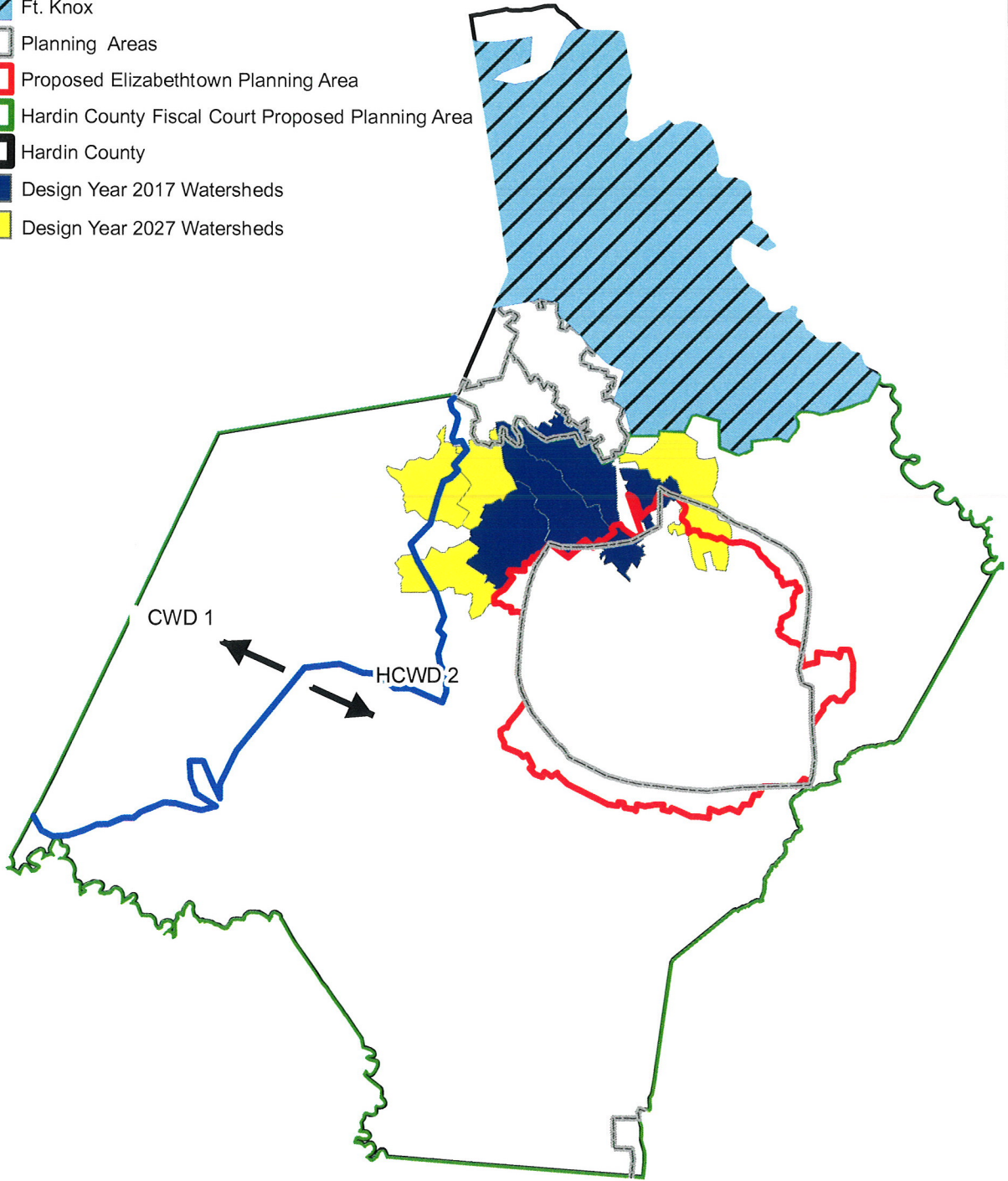
6.03 POPULATION PROJECTIONS

Population projections for areas within the proposed county planning area are necessary to account for anticipated future flows in the various subwatersheds. In order to obtain projected populations, information from the LTADD was examined.

S:\051951-1\0001980100\1\Wrd\Facilities Plan\Report\Figures for Report\Fig. 6.02-1 Northern Service Area.mxd

Legend

-  Ft. Knox
-  Planning Areas
-  Proposed Elizabethtown Planning Area
-  Hardin County Fiscal Court Proposed Planning Area
-  Hardin County
-  Design Year 2017 Watersheds
-  Design Year 2027 Watersheds



NORTHERN SERVICE AREA

REGIONAL WASTEWATER FACILITIES PLAN








HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY

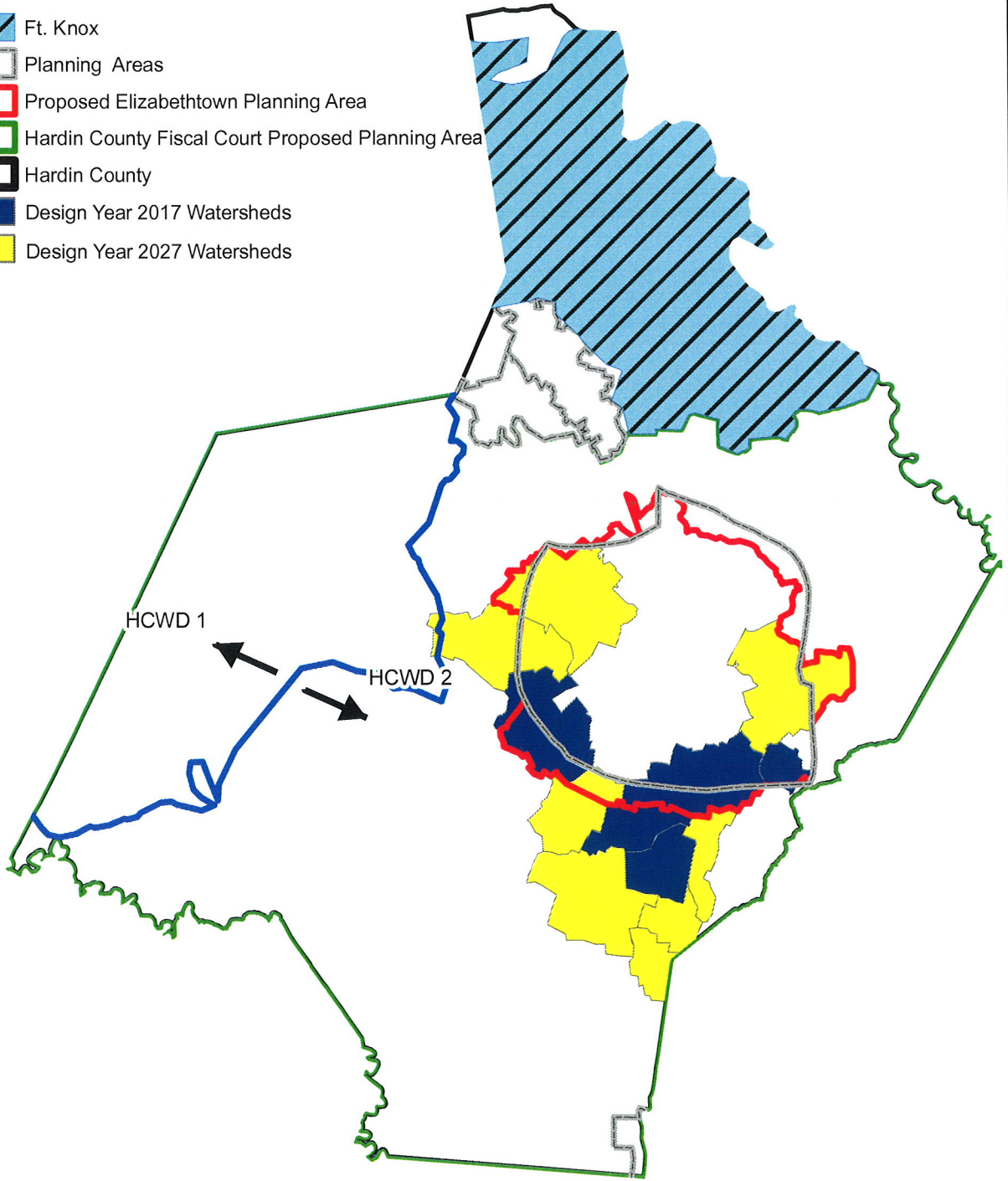


FIGURE 6.02-1
5-980-001

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Legend

-  Ft. Knox
-  Planning Areas
-  Proposed Elizabethtown Planning Area
-  Hardin County Fiscal Court Proposed Planning Area
-  Hardin County
-  Design Year 2017 Watersheds
-  Design Year 2027 Watersheds



SOUTHERN SERVICE AREA

REGIONAL WASTEWATER FACILITIES PLAN








**HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**

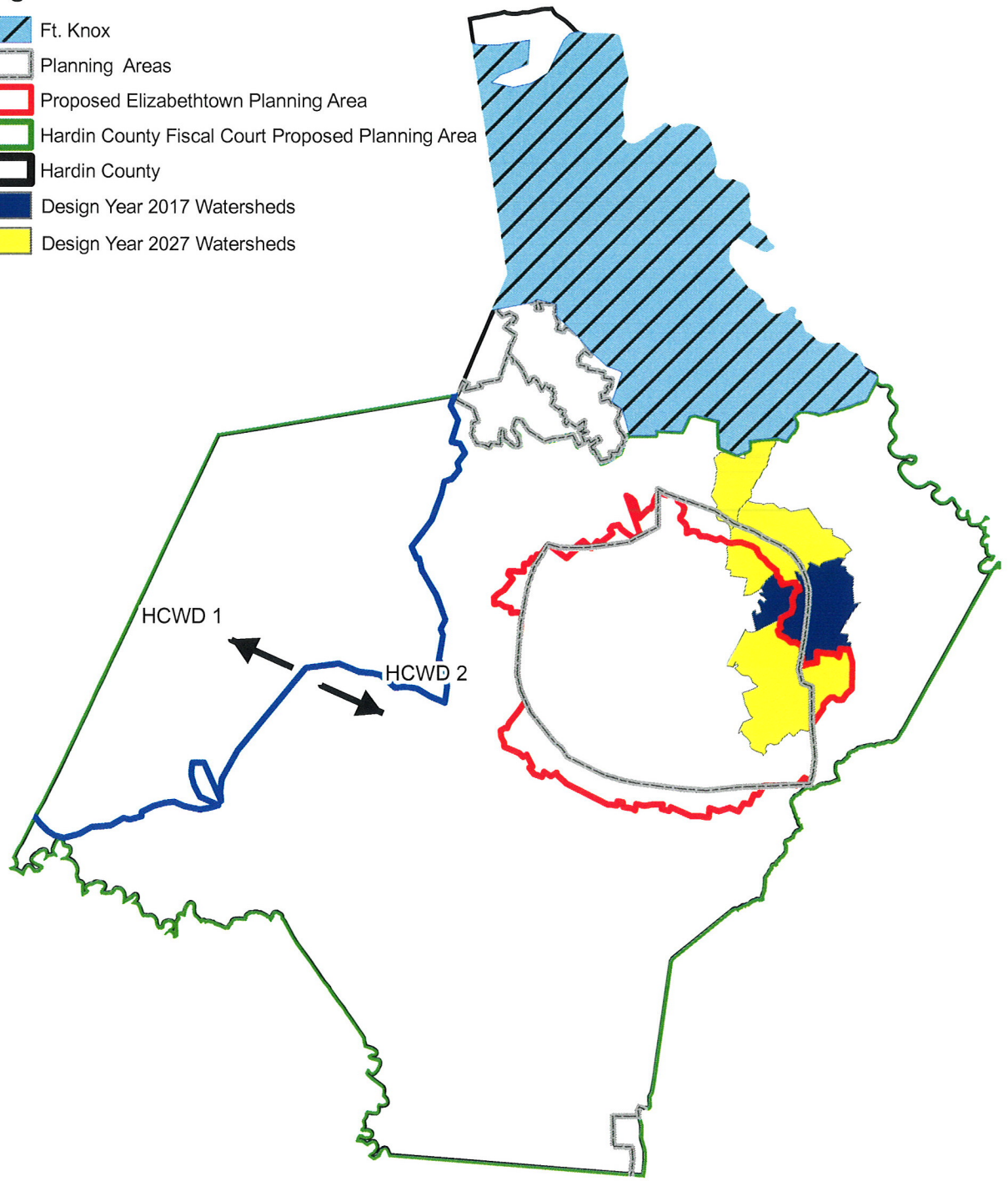


**FIGURE 6.02-2
5-980-001**

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Legend

-  Ft. Knox
-  Planning Areas
-  Proposed Elizabethtown Planning Area
-  Hardin County Fiscal Court Proposed Planning Area
-  Hardin County
-  Design Year 2017 Watersheds
-  Design Year 2027 Watersheds



EASTERN SERVICE AREA

REGIONAL WASTEWATER FACILITIES PLAN








**HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**

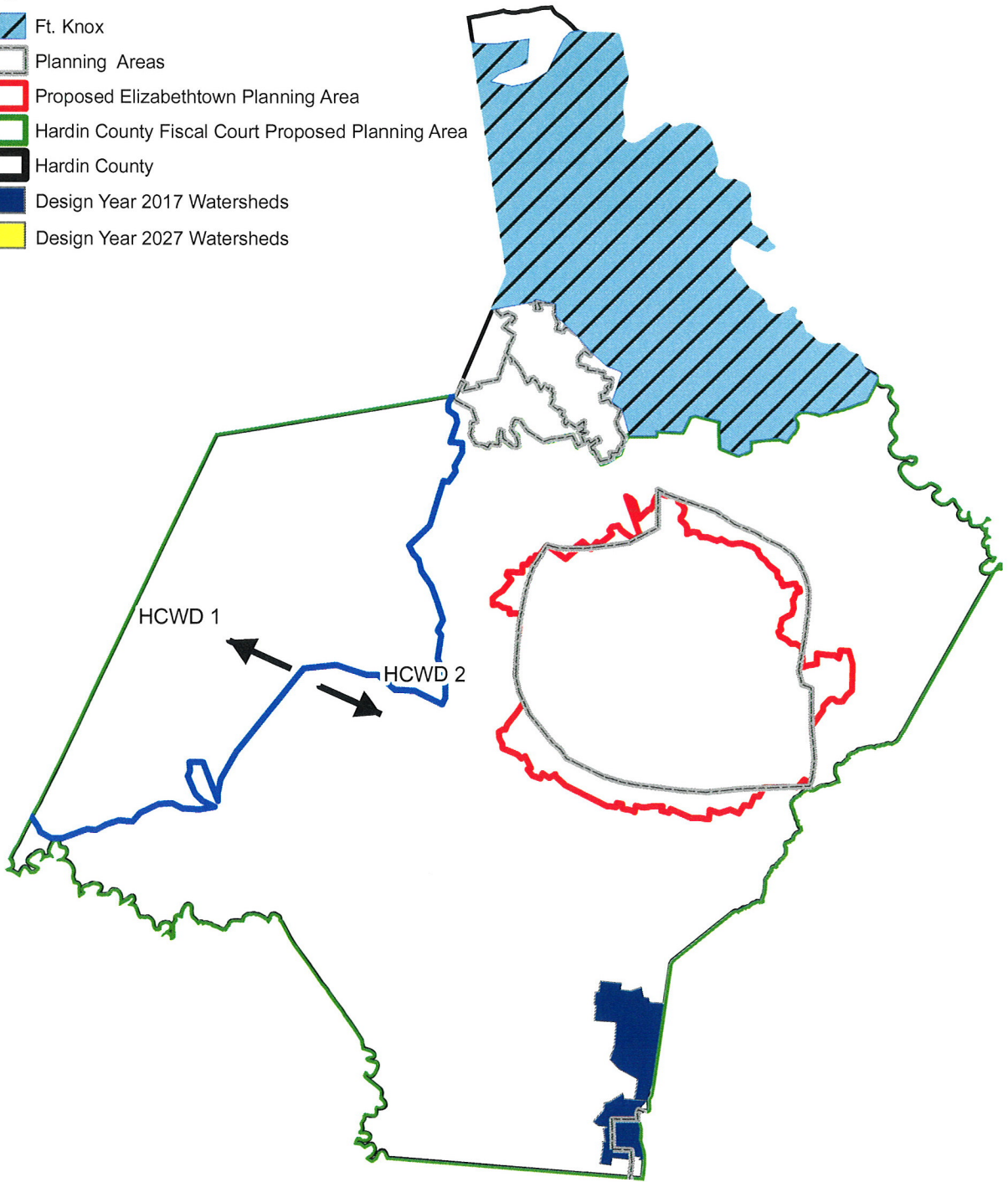


**FIGURE 6.02-3
5-980-001**

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Legend

-  Ft. Knox
-  Planning Areas
-  Proposed Elizabethtown Planning Area
-  Hardin County Fiscal Court Proposed Planning Area
-  Hardin County
-  Design Year 2017 Watersheds
-  Design Year 2027 Watersheds



UPTON AND SONORA SERVICE AREA

REGIONAL WASTEWATER FACILITIES PLAN








**HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**

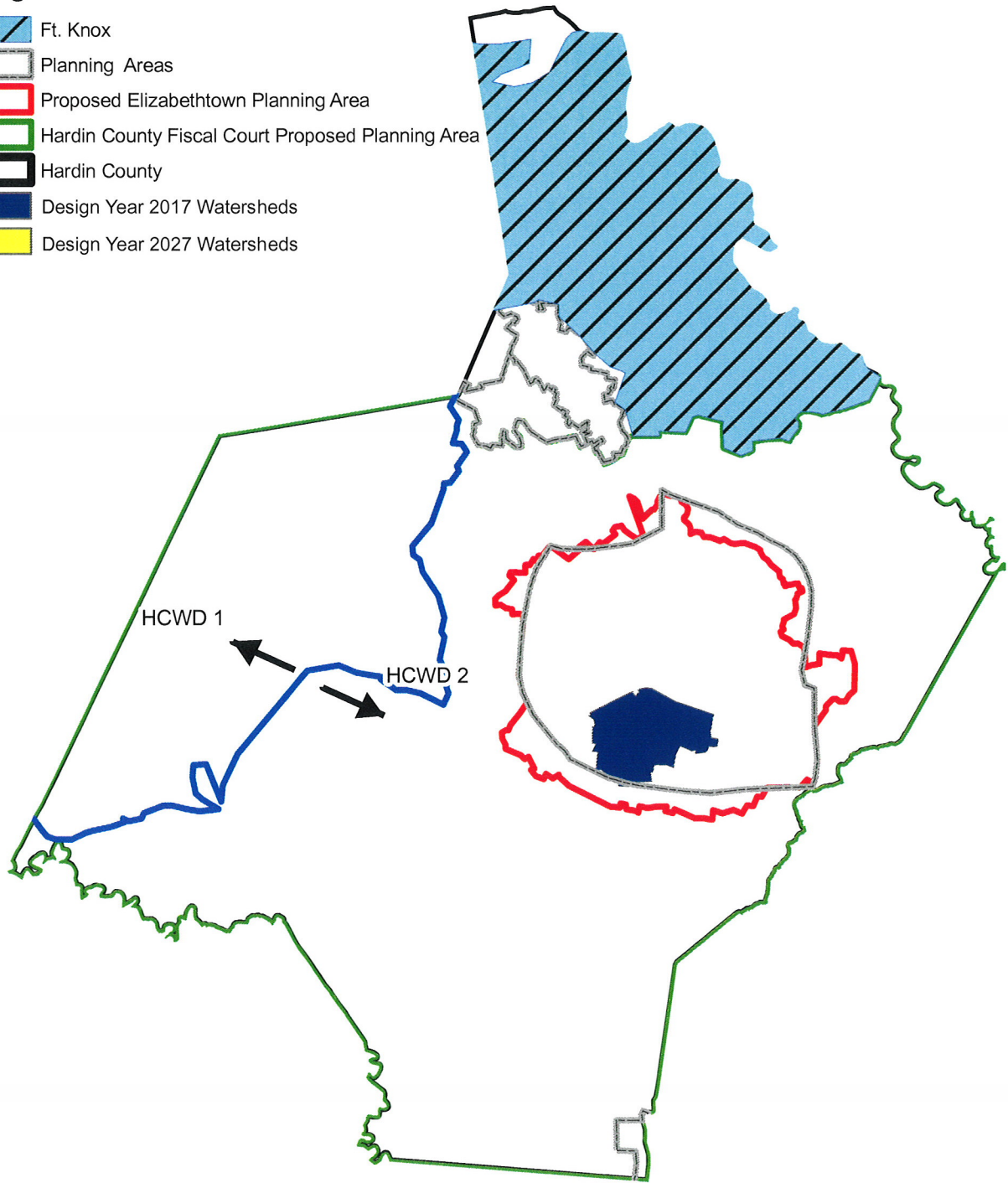


**FIGURE 6.02-4
5-980-001**

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Legend

-  Ft. Knox
-  Planning Areas
-  Proposed Elizabethtown Planning Area
-  Hardin County Fiscal Court Proposed Planning Area
-  Hardin County
-  Design Year 2017 Watersheds
-  Design Year 2027 Watersheds



VALLEY CREEK SERVICE AREA

REGIONAL WASTEWATER FACILITIES PLAN

HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY



FIGURE 6.02-5
5-980-001

TABLE 6.02-2

2003 POPULATIONS FOR WATERSHEDS ACCEPTED INTO ELIZABETHTOWN PLANNING AREA

Service Area	2003 Population
Northern Service Area	
Urban Area: Upper Shaw Creek (Smithersville)	541
Near Urban Area: Upper Freeman Creek	453
Southern Service Area	
Urban Areas: East Rhudes Creek (Oxmoor Village and Hodgenville)	1,944
Middle Creek Branch (Thoroughbred Estates)	485
West Rhudes Creek (Cecilia)	992
Near Urban Area: Billy Creek	1,298
Eastern Service Area	
Urban Area: Buffalo Creek (Bardstown Rd Area)	1,360
Near Urban Areas: Upper Valley Creek	1,184
Upper Buffalo Creek	588
Valley Creek Service Area	
Valley Creek (New Glendale Road)	394
Valley Creek (Industrial Area)	353

Population projections for the county wastewater plan were estimated at twice the predicted growth of the Hardin County Metropolitan Planning Organization. This projection is justified because recent population growth predicted by the number of housing starts that has more than doubled the Hardin County Metropolitan Planning Organization predicted population growth. Tables 6.03-1 through 6.03-4 illustrate the equivalent population projections in each of the sub watersheds in the four service areas of the HCWD2 planning area.

Northern Service Area	2003 Population	2017 Population	2027 Population
Pawley Creek (Lavista Estate & Rineyville)	2,010	2,650	3,460
Upper Otter Creek (Boone Rd. Area)	1,270	2,060	3,040
Brushy Fork (Burns-Deckard School Rd Area)	2,230	3,140	4,270
Mill Creek Branch (Airview Estates)	2,010	2,310	2,680
Lower Otter Creek	750	N/A	1,350
Flippin Creek	330	N/A	1,060
Upper Pawley Creek	310	N/A	1,710
Mill Creek	1,110	N/A	1,670

Table 6.03-1 Northern Service Area 2017 and 2027 Populations

Southern Service Area	2003 Population	2017 Population	2027 Population
North Upper Nolin River (Gilead Church - Glendale Rd, Glendale Industrial Site)	155	24,800 ⁽¹⁾	24,800 ⁽¹⁾
Rose Run (Glendale/North Glendale)	500	750	1,060
Upper West Rhudes Creek	640	N/A	890
Lower Valley Creek	210	N/A	310
Nolin River	350	N/A	480
Cox Run	160	N/A	220
Upper Nolin River	110	N/A	160
Jackson Branch	380	N/A	830

⁽¹⁾Equivalent Population

Table 6.03-2 Southern Service Area 2017 and 2027 Populations

Eastern Service Area	2003 Population	2017 Population	2027 Population
Upper Younger Creek (Bluegrass Pkwy/Springfield Rd)	830	1,160	1,580
Clear Creek	970	N/A	1,690
Cedar Creek	350	N/A	500

Table 6.03-3 Eastern Service Area 2017 and 2027 Populations

Upton and Sonora Service Area	2003 Population	2017 Population	2027 Population
Dorsey Run (Sonora)	510	580	670
Sandy Creek (Upton)	310	340	380

Table 6.03-4 Upton and Sonora Service Area 2017 and 2027 Populations

6.04 PROJECTED INDUSTRIAL WASTEWATER FLOWS

There is one anticipated major industrial development site in the county planning area within the planning horizon. The Glendale Industrial site in the North Upper Nolin River watershed is expected to have significant industrial development in the future. The projected flow from this industrial area is computed by multiplying the industrial acreage by 1,500 gallons per day. The estimated acreage at the Glendale Industrial site is anticipated to be 1,628 acres in 2017, which translates to an average daily flow of 2,442,000 gallons per day. In the projection of daily wastewater flows and the cost analysis, this flow is converted to an equivalent population by dividing the flow by 100 gallons per capita per day.

The Glendale Industrial site is pursuing an auto manufacturing facility. To make sure enough wastewater capacity is projected, the daily wastewater flow from the Toyota Camry plant in Georgetown, Kentucky was reviewed. Daily wastewater discharge from that facility is about 1 MGD with a peak flow of 1.9 MGD. Allowing for about twice this usage should allow nearly any facility to be located at the Glendale Industrial site. Final infrastructure planning for this area will be completed when the future tenant and daily flows are known.

6.05 PROJECTED DAILY WASTEWATER FLOWS

Projected daily wastewater flows generated within the proposed service areas for the 10- and 20-year planning horizons are presented in Table 6.05-1 through Table 6.05-8. The projected average daily flows were computed by multiplying the equivalent projected population by 100 gallons per person per day for Design Year 2017 (0- to 10-year period) and Design Year 2027 (11- to 20-year period). The peak hourly flow in gallons per minute was computed using a peak factor based on the equivalent population.

This peak factor was derived from *Recommended Standards for Wastewater Facilities, 1997 Edition* (aka Ten State Standards), and was computed using the following formula:

$$PF = \frac{18 + \sqrt{P}}{4 + \sqrt{P}}$$

where P is the equivalent population (in thousands)

Flow volume for generation of future residential wastewater was based on information obtained from *Recommended Standards for Wastewater Facilities, 1990 Edition* (aka Ten State Standards), which states “the sizing of wastewater facilities receiving flows from new wastewater collection systems shall be based on an average daily flow of 100 gallons per capita per day plus wastewater flow from industrial plants and major institutional and commercial facilities unless water use data or other justification upon which to better estimate flow is provided.” This approach is “intended to cover normal infiltration for systems built with modern design techniques.” The projected flows computed in each watershed will be used to determine size of trunk sewers, conveyance facilities, and any proposed WWTP in the corresponding service area.

Northern Service Area Watersheds	Design Year 2017			
	Eq. Population	Peak Factor	ADF (gpd)	PHF (gpm)
Pawley Creek (Lavista Estate and Rineyville)	2,650	3.49	265,000	642
Upper Otter Creek (Boone Road Area)	2,060	3.58	206,000	512
Brushy Fork (Burns-Deckard School Road Area)	3,140	3.43	314,000	747
Mill Creek Branch (Airview Estates)	2,310	3.54	231,000	567
Total Average Daily Flow to North County WWTP	10,160	2.95	1,016,000	2,080

ADF--Average Daily Flow
PHF--Peak Hourly Flow

Table 6.05-1 Northern Service Area 2017 Flow Projections

Southern Service Area Watersheds	Design Year 2017			
	Eq. Population	Peak Factor	ADF (gpd)	PHF (gpm)
Rose Run (Glendale/North Glendale)	750	3.88	75,000	202
North Upper Nolin River (Gilead Church - Glendale Rd, Glendale Industrial Site)	24,780	2.56	2,478,000	4,404
Total Average Daily Flow to South County WWTP	25,530	2.55	2,553,000	4,515

ADF--Average Daily Flow
PHF--Peak Hourly Flow

Table 6.05-2 Southern Service Area 2017 Flow Projections

	Design Year 2017			
	Eq. Population	Peak Factor	ADF (gpd)	PHF (gpm)
Eastern Service Area Watersheds				
Upper Younger Creek (Bluegrass Pkwy/Springfield Rd)	1,160	3.76	116,000	303
Total Average Daily Flow to East County WWTP	1,160	3.76	116,000	303

ADF--Average Daily Flow
PHF--Peak Hourly Flow

Table 6.05-3 Eastern Service Area 2017 Flow Projections

	Design Year 2017			
	Eq. Population	Peak Factor	ADF (gpd)	PHF (gpm)
Upton and Sonora Service Area Watersheds				
Dorsey Run (Sonora)	580	3.94	58,000	159
Sandy Creek (Upton)	340	4.05	34,000	96
Total Estimated Average Daily Flow to Southern County WWTP	920	3.82	92,000	244

ADF--Average Daily Flow
PHF--Peak Hourly Flow

Table 6.05-4 Upton and Sonora Service Area 2017 Flow Projections

	Design Year 2027			
	Eq. Population	Peak Factor	ADF (gpd)	PHF (gpm)
Northern Service Area Watersheds				
Pawley Creek (Lavista Estate & Rineyville)	3,460	3.39	346,000	814
Upper Otter Creek (Boone Rd. Area)	3,040	3.44	304,000	726
Brushy Fork (Burns-Deckard School Rd Area)	4,270	3.31	427,000	981
Mill Creek Branch and Mill Creek (Airview Estates)	4,350	3.30	435,000	997
Lower Otter Creek	1,350	3.71	135,000	348
Flippin Creek	1,060	3.78	106,000	279
Upper Pawley Creek	1,710	3.64	171,000	432
Total Average Daily Flow to North County WWTP	19,240	2.67	1,924,000	3,567

ADF--Average Daily Flow
PHF--Peak Hourly Flow

Table 6.05-5 Northern Service Area 2027 Flow Projections

Southern Service Area Watersheds	Design Year 2027			
	Eq. Population	Peak Factor	ADF (gpd)	PHF (gpm)
Rose Run (Glendale/North Glendale)	1,060	3.78	106,000	279
North Upper Nolin River (Gilead Church - Glendale Rd, Glendale Industrial Site)	24,800	2.56	2,480,000	4,407
Lower Valley Creek	310	4.07	31,000	88
Nolin River	480	3.98	48,000	133
Upper West Rhudes	890	3.83	89,000	237
Cox Run	220	4.13	22,000	63
Upper Nolin River	160	4.18	16,000	46
Jackson Branch	830	3.85	83,000	222
Total Average Daily Flow to Southern County WWTP	28,750	2.50	2,875,000	4,982

ADF–Average Daily Flow
PHF–Peak Hourly Flow

Table 6.05-6 Southern Service Area 2027 Flow Projections

Eastern Service Area Watersheds	Design Year 2027			
	Eq. Population	Peak Factor	ADF (gpd)	PHF (gpm)
Upper Younger Creek (Bluegrass Pkwy/Springfield Rd)	1,580	3.66	158,000	402
Clear Creek	1,690	3.64	169,000	427
Cedar Creek	500	3.97	50,000	138
Total Average Daily Flow to Eastern County WWTP	3,770	3.36	377,000	879

ADF–Average Daily Flow
PHF–Peak Hourly Flow

Table 6.05-7 Eastern Service Area 2027 Flow Projections

Upton and Sonora Service Area Watersheds	Design Year 2027			
	Eq. Population	Peak Factor	ADF (gpd)	PHF (gpm)
Dorsey Run (Sonora)	670	3.91	67,000	182
Sandy Creek (Upton)	380	4.03	38,000	106
Total Average Daily Flow to Southern County WWTP	1,050	3.79	105,000	276

ADF–Average Daily Flow
PHF–Peak Hourly Flow

Table 6.05-8 Upton and Sonora Service Area 2027 Flow Projections

6.06 PROJECTED WASTELOADS

For the purposes of this plan, the projected wasteloads are assumed to be typical of domestic strength wastewater. Wastewater concentrations for the purpose of sizing WWTP process units assumed BOD = 225 mg/L, TSS = 250 mg/L, NH₃-N = 20 mg/L and TP = 7 mg/L.

6.07 PROJECTED PERMIT LIMITS AND WASTELOAD ALLOCATION

The Kentucky Division of Water (KDOW) was contacted on September 29, 2005 requesting wasteload allocations for three potential WWTPs in Hardin County. KDOW provided wasteload allocations in a letter dated January 18, 2007. A copy of the letter is included in Appendix E. The Nolin River WWTP (southern county WWTP) was considered for a 3.5 mgd initial and up to a 10.5 mgd ultimate facility. Table 6.07-1 illustrates the permitted loads for the proposed Nolin River WWTP.

	ADF = 3.5 mgd		ADF = 10.5 mgd	
	May 1 – October 31	November 1 – April 30	May 1 – October 31	November 1 – April 30
CBOD ₅ , mg/L	25 mg/L	25 mg/L	25 mg/L	25 mg/L
TSS, mg/L	30 mg/L	30 mg/L	30 mg/L	30 mg/L
NH ₃ -N, mg/L	20 mg/L	20 mg/L	10 mg/L	20 mg/L
DO, mg/L	7 mg/L	7 mg/L	7 mg/L	7 mg/L
Total Residual Chlorine, mg/L	0.011 mg/L	0.011 mg/L	0.011 mg/L	0.011 mg/L
E. Coli Weekly Geometric Mean, mg/L	240 colonies/100 mL	240 colonies/100 mL	240 colonies/100 mL	240 colonies/100 mL
E. Coli Monthly Geometric Mean, mg/L	130 colonies/100 mL	130 colonies/100 mL	130 colonies/100 mL	130 colonies/100 mL
Reliability Classification = Grade 1				

Table 6.07-1 Wasteload Allocation for Proposed Nolin River WWTP

The Otter Creek WWTP (northern county WWTP) was considered for a 2.0 mgd initial and up to 6.0 mgd ultimate facility. Table 6.07-2 illustrates the permitted loads for the proposed Otter Creek WWTP.

	ADF = 2 or 6 mgd	
	May 1 – October 31	November 1 – April 30
CBOD ₅ , mg/L	25 mg/L	25 mg/L
TSS, mg/L	30 mg/L	30 mg/L
NH ₃ -N, mg/L	4 mg/L	10 mg/L
DO, mg/L	7 mg/L	7 mg/L
Total Residual Chlorine, mg/L	0.011 mg/L	0.011 mg/L
E. Coli Weekly Geometric Mean, mg/L	240 colonies/100 mL	240 colonies/100 mL
E. Coli Monthly Geometric Mean, mg/L	130 colonies/100 mL	130 colonies/100 mL
Reliability Classification = Grade 1		

Table 6.07-2 Wasteload Allocation for Proposed Otter Creek WWTP

The Younger Creek WWTP (eastern county WWTP) was not considered by KDOW to be a viable option for a WWTP due to the dissolved oxygen violations in the Rolling Fork River downstream of the proposed Younger Creek WWTP. KDOW did not provide a wasteload allocation.

SECTION 7
CONVEYANCE AND TREATMENT ALTERNATIVES

7.01 INTRODUCTION

This section will evaluate alternatives for providing collection and conveyance of wastewater for subwatersheds in the proposed service areas of the Hardin County planning area.

7.02 GENERAL

Hardin County, Kentucky has five municipal WWTPs that serve various cities in the county. This RWWFP explores alternatives that could be used to provide public sanitary sewer service to areas of the county that do not currently have existing sanitary sewer service. Many residents utilize on-site sewage disposal systems such as septic tanks/absorption fields or package treatment plants. Providing public sanitary sewer service to these residents could help improve water quality and public health by reducing the number of failing septic systems. Section 4 of this report summarized existing municipal collection systems in place in Hardin County. The following paragraphs will explain the proposed alternatives for the conveyance and treatment of wastewater for the four service areas in Hardin County.

7.03 EVALUATION OF ALTERNATIVES

This section explains the alternatives considered for the collection and conveyance of wastewater from each watershed in the planning area. The watersheds are divided into service areas and design years. The alternatives include a summary of the estimated projected cost in 2006 dollars.

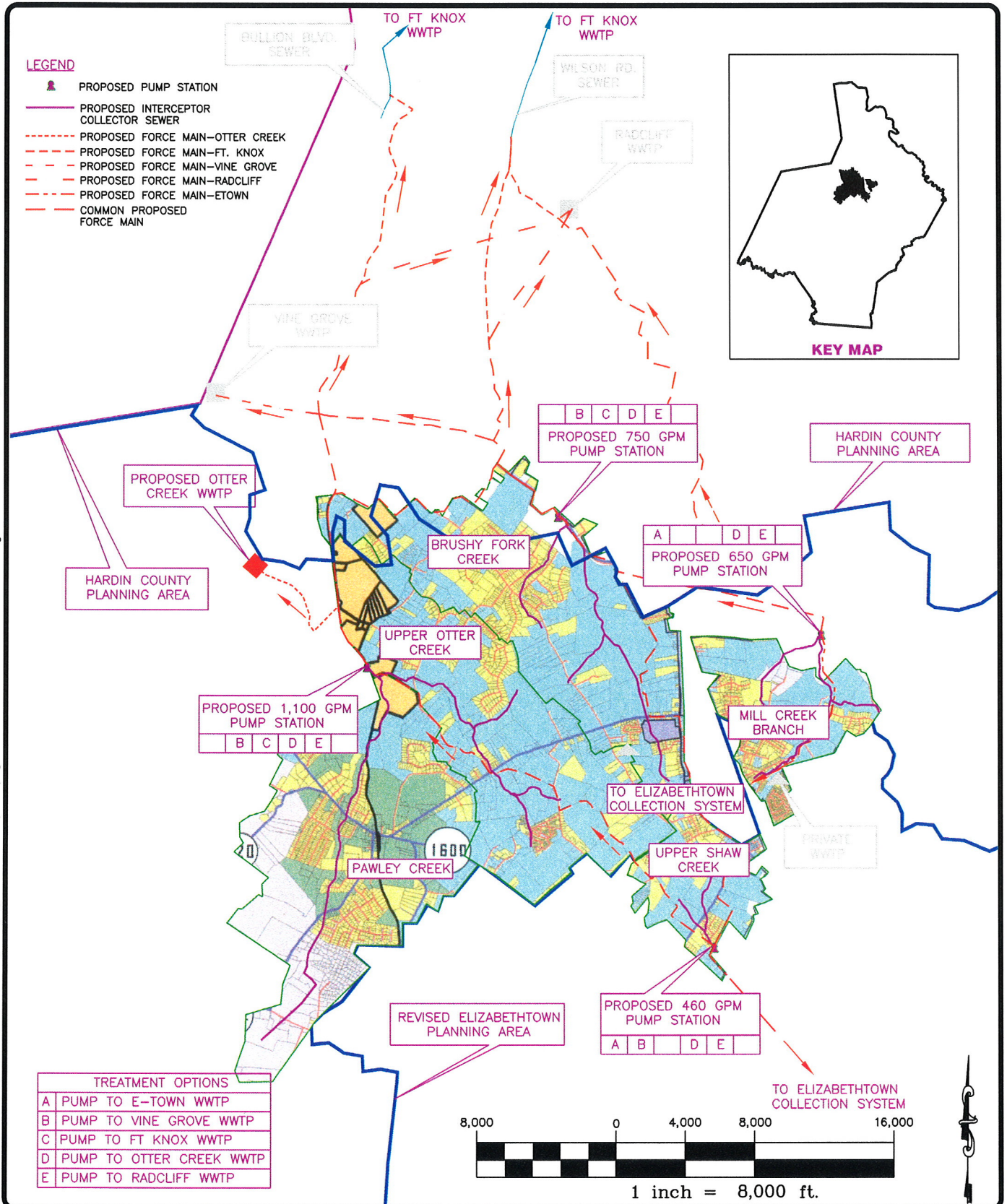
A. Northern Service Area–Design Year 2017

Figure 7.03-1 illustrates the proposed collection systems and conveyance alternatives for the Northern Service Area–Design Year 2017. In each scenario, the property owner would be responsible for the cost to connect to the new trunk sewer. The costs of collector sewers have not been included in these alternative evaluations since they are common to each alternative. Appendix G presents the cost development for the 20-year net present worth analysis. The following paragraphs discuss the watersheds in the Northern Service Area.

1. Pawley Creek and Upper Otter Creek Watersheds (LaVista Estates, Boone Road, and Rineyville)

The Pawley Creek and Upper Otter Creek Watersheds are included together because the proposed collection system in each watershed conveys wastewater to a common pump station. Table 7.03-1 summarizes the system components required for each alternative and provides a comparison of the total present worth for each of the alternatives for the Pawley Creek and Upper Otter Creek Watersheds.

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**DESIGN YEAR 2017 - NORTHERN SERVICE AREAS
COLLECTION AND CONVEYANCE ALTERNATIVES**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 7.03-1
JOB NO. 5-980-001

TABLE 7.03-1

NORTHERN SERVICE AREA YEAR 2017-PAWLEY CREEK AND UPPER OTTER CREEK WATERSHEDS

	Size (in)	Conveyance and Treatment Alternatives			
		Vine Grove WWTP	Fort Knox WWTP	Otter Creek WWTP	Radcliff WWTP
Population		4710	4710	4710	4710
Residential Flow (mgd)		0.471	0.471	0.471	0.471
Industrial Flow (mgd)					
Total Flow (mgd)		0.471	0.471	0.471	0.471
Pumping Stations					
Number		1	1	1	1
Capacity (gpm)		1,100	1,100	1,100	1,100
Gravity Interceptors (LF)					
	8	17,580	17,580	17,580	17,580
	10	8,370	8,370	8,370	8,370
	12	4,030	4,030	4,030	4,030
	15	7,460	7,460	7,460	7,460
Manholes (number)		150	150	150	150
Force Main (LF)					
	8	0	0	0	0
	10	21,730	36,330	11,590	36,370
	12	0	0	0	0
Total Present Worth					
Operation and Maintenance (20 yr)		\$16,801,000	\$10,615,000	\$10,565,000	\$16,714,000
Initial Capital Costs		\$9,669,000	\$8,204,000	\$9,693,000	\$10,722,000
Total Present Worth		\$26,470,000	\$18,819,000	\$20,258,000	\$27,436,000
Percent Greater Than Most Cost-Effective Alternative		41%	0%	8%	46%

Based on the present worth analysis presented in Table 7.03-1, the Fort Knox WWTP alternative has the lowest total present worth, but the Otter Creek WWTP is only 7 percent more on a total present worth basis. Since the two alternatives are less than 10 percent different on a total present worth basis, they could be considered equivalent on a monetary basis. Section 7.04 of this report reviews the noneconomic factors for each of these alternatives. The noneconomic factors will be considered in the selection of the most favorable alternative.

2. Brushy Fork Creek Watershed (Burns-Deckard School Road)

Table 7.03-2 summarizes the system components required for each alternative and provides a comparison of the total present worth for each of the alternatives for the Brushy Fork Creek Watershed.

Based on the present worth analysis presented in Table 7.03-2, the Fort Knox WWTP alternative has the lowest total present worth. No other alternative is within 10 percent of the Fort Knox alternative.

3. Mill Creek Branch Watershed (Airview Estates)

Table 7.03-3 summarizes the system components required for each alternative and provides a comparison of the total present worth for each of the alternatives for the Mill Creek Branch Watershed.

Based on the present worth analysis presented in Table 7.03-3, the Elizabethtown collection alternative has the lowest total present worth. No other alternative is within 10 percent of the Elizabethtown alternative.

4. Upper Shaw Creek Watershed (Smithersville)

The Upper Shaw Creek Watershed was accepted into the City of Elizabethtown updated planning area. The population projection for the Upper Shaw Creek Watershed is given in Appendix F, and the table summarizing the system components required for each alternative and a present worth comparison for each alternative is included in Appendix G.

B. Southern Service Area—Design Year 2017

Figure 7.03-2 illustrates the proposed collection systems and conveyance alternatives for the Southern Service Area—Design Year 2017. In each scenario, the property owner would be responsible for the cost to connect to the new trunk sewer. The costs of collector sewers have not been included in these alternative evaluations since they are common to each alternative. Appendix G presents the cost development for the present worth analysis. The following paragraphs discuss the watersheds in the Southern Service Area.

TABLE 7.03-2

NORTHERN SERVICE AREA YEAR 2017-BRUSHY FORK CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives			
		Vine Grove WWTP	Fort Knox WWTP	Otter Creek WWTP	Radcliff WWTP
Population		3,140	3,140	3,140	3,140
Residential Flow (mgd)		0.314	0.314	0.314	0.314
Industrial Flow (mgd)					
Total Flow (mgd)		0.314	0.314	0.314	0.314
Pumping Stations					
Number		1	1	1	1
Capacity (gpm)		750	750	750	750
Gravity Interceptors (LF)					
	8	11,140	11,140	11,140	11,140
	10	9,750	9,750	9,750	9,750
	12	7,170	7,170	7,170	7,170
	15	0		0	0
Manholes (number)		112	112	112	112
Force Main (LF)					
	8	0	0	0	0
	10	22,110	25,570	32,000	22,580
	12	0	0	0	0
Total Present Worth					
Operation and Maintenance (20 yr)		\$11,811,000	\$6,870,000	\$8,445,000	\$10,160,000
Initial Capital Costs		\$7,404,000	\$5,866,000	\$8,679,000	\$6,904,000
Total Present Worth		\$19,215,000	\$12,736,000	\$17,124,000	\$17,064,000
Percent Greater Than Most Cost Effective Alternative		51%	0%	34%	34%






TABLE 7.03-3

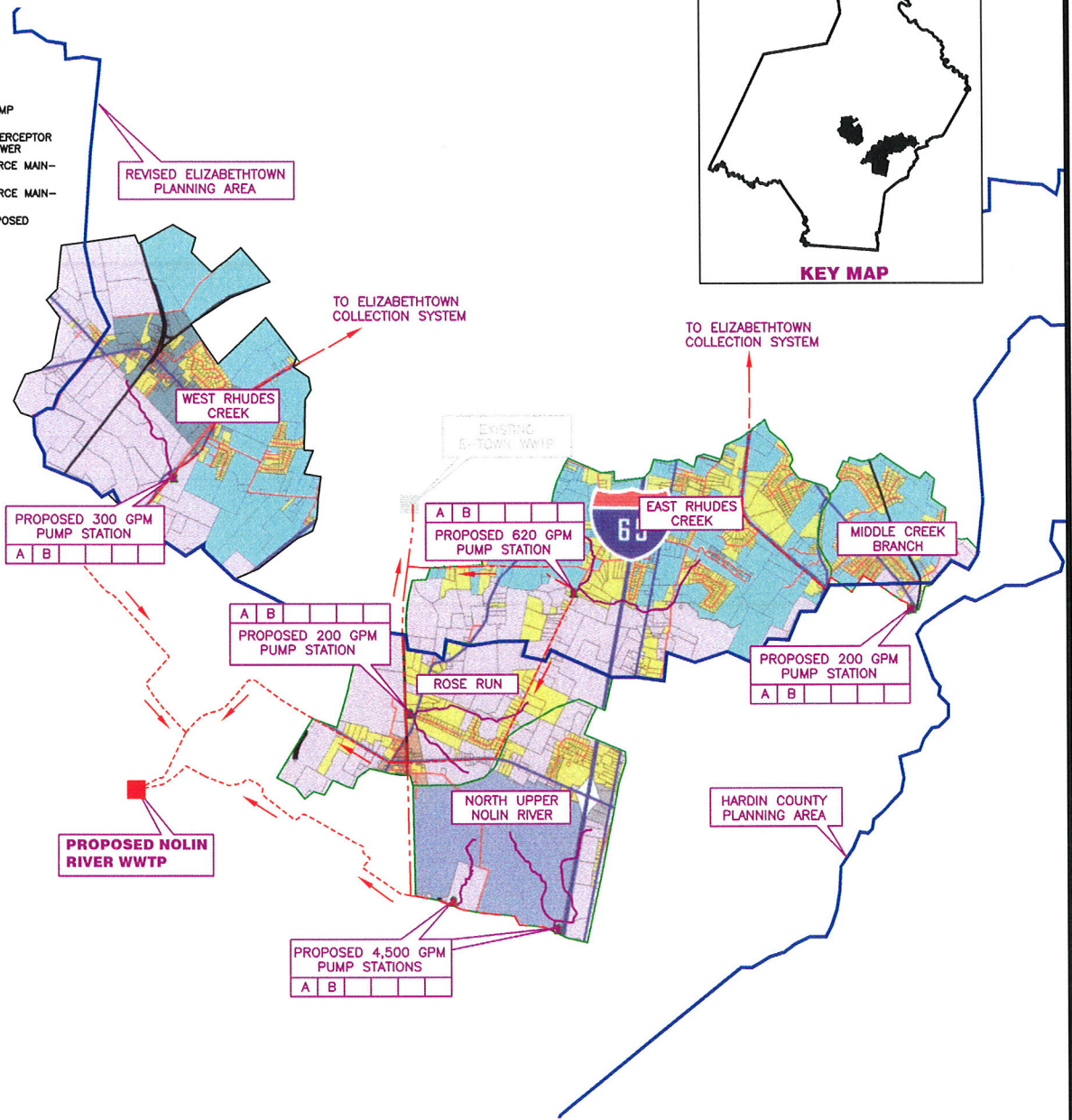
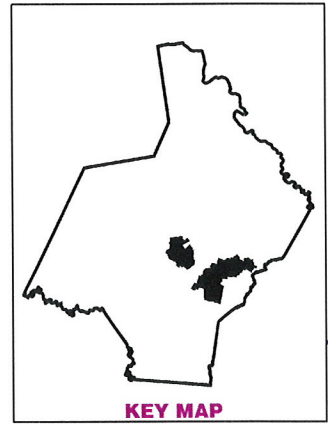
NORTHERN SERVICE AREA YEAR 2017-MILL CREEK BRANCH WATERSHED

	Size (in)	Conveyance and Treatment Alternatives		
		Elizabethtown WWTP	Otter Creek WWTP	Radcliff WWTP
Population		2,310	2,310	2,310
Residential Flow (mgd)		0.231	0.231	0.231
Industrial Flow (mgd)				
Total Flow (mgd)		0.231	0.231	0.231
Pumping Stations				
Number		1	2	1
Capacity (gpm)		650	650 650	650
Gravity Interceptors (LF)				
	8	6,020	6,020	6,020
	10	7,480	7,480	7,480
	12	0	0	0
	15	0	0	0
Manholes (number)		54	54	54
Force Main (LF)				
	8	0	0	0
	10	23,960	49,980	36,940
	12	0	0	0
Total Present Worth				
Operation and Maintenance (20 yr)		\$6,876,000	\$7,652,000	\$8,004,000
Initial Capital Costs		\$5,220,000	\$7,920,000	\$5,820,000
Total Present Worth		\$12,096,000	\$15,572,000	\$13,824,000
Percent Greater Than Most Cost-Effective Alternative		0%	29%	14%

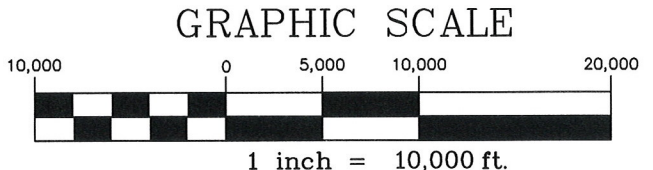
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LEGEND

-  PROPOSED PUMP STATION
-  PROPOSED INTERCEPTOR COLLECTOR SEWER
-  PROPOSED FORCE MAIN-NOLIN RIVER
-  PROPOSED FORCE MAIN-ETOWN
-  COMMON PROPOSED FORCE MAIN



TREATMENT OPTIONS	
A	PUMP TO E-TOWN WWTP
B	PUMP TO NOLIN RIVER WWTP



**DESIGN YEAR 2017 - SOUTHERN SERVICE AREAS
COLLECTION AND CONVEYANCE ALTERNATIVES**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO.2
HARDIN COUNTY, KENTUCKY**



FIGURE 7.03-2
JOB NO. 5-980-001

1. North Upper Nolin River Watershed (Gilead Church–Glendale Road and Glendale Industrial Tract)

Table 7.03-4 summarizes the system components required for each alternative and provides a comparison of the total present worth for each of the alternatives for the North Upper Nolin River Watershed.

Based on the present worth analysis presented in Table 7.03-4, the Elizabethtown WWTP alternative has the lowest total present worth, but the Nolin River WWTP is only 7 percent more on a total present worth basis. Since the two alternatives are less than 10 percent different on a total present worth basis, they would be considered equivalent on a monetary basis. Section 7.04 of this report reviews the noneconomic factors for each of these alternatives. The noneconomic factors will be considered in the selection of the most favorable alternative.

2. Rose Run Watershed (Glendale)

Table 7.03-5 summarizes the system components required for each alternative and provides a comparison of the total present worth for each of the alternatives for the Rose Run Watershed.

Based on the present worth analysis presented in Table 7.03-5, the Elizabethtown WWTP alternative has the lowest total present worth. The other alternative is not within 10 percent of the Elizabethtown alternative.

3. East Rhudes Creek Watershed (Glendale, Oxmoor Village, New Glendale Road, Hodgenville Road Area)

The East Rhudes Creek Watershed was accepted into the City of Elizabethtown updated planning area. The population projection for the East Rhudes Creek Watershed is given in Appendix F, and the table summarizing the system components required for each alternative and a present worth comparison for each alternative is included in Appendix G.

4. Middle Creek Branch Watershed (Thoroughbred Estates/Thousand Oaks, Hodgenville Road Area)

The Middle Creek Branch Watershed was accepted into the City of Elizabethtown updated planning area. The population projection for the Middle Creek Branch Watershed is given in Appendix F and the table summarizing the system components required for each alternative and a present worth comparison for each alternative is included in Appendix G.

TABLE 7.03-4

SOUTHERN SERVICE AREA YEAR 2017-NORTH UPPER NOLIN RIVER WATERSHED

	Size (in)	Conveyance and Treatment Alternatives	
		Elizabethtown WWTP	Nolin River WWTP
Population		377	377
Residential Flow (mgd)		0.0377	0.0377
Industrial Flow (mgd)		2.442	2.442
Total Flow (mgd)		2.4797	2.4797
Pumping Stations			
Number		2	2
Capacity (gpm)		4,500	4,500
		4,500	4,500
Gravity Interceptors (LF)			
	8	0	0
	10	7,960	7,960
	12	0	0
	15	12,050	12,050
Manholes (number)		80	80
Force Main (LF)			
	14	0	0
	16	0	0
	18	25,610	29,730
Total Present Worth			
Operation and Maintenance (20 yr)		\$50,150,000	\$42,779,000
Initial Capital Costs		\$16,043,000	\$28,316,000
Total Present Worth		\$66,193,000	\$71,095,000
Percent Greater Than Most Cost-Effective Alternative		0%	7%

TABLE 7.03-5

SOUTHERN SERVICE AREA YEAR 2017-ROSE RUN WATERSHED

	Size (in)	Conveyance and Treatment Alternatives	
		Elizabethtown WWTP	Nolin River WWTP
Population		750	750
Residential Flow (mgd)		0.075	0.075
Industrial Flow (mgd)			
Total Flow (mgd)		0.075	0.075
Pumping Stations			
Number		1	1
Capacity (gpm)		200	200
Gravity Interceptors (LF)			
	8	12,580	12,580
	10	0	0
	12	0	0
	15	0	0
Manholes (number)		50	50
Force Main (LF)			
	6	12,410	22,350
	8	0	0
	10	0	0
Total Present Worth			
Operation and Maintenance (20 yr)		\$2,701,000	\$2,852,000
Initial Capital Costs		\$2,446,000	\$3,409,000
Total Present Worth		\$5,147,000	\$6,261,000
Percent Greater Than Most Cost-Effective Alternative		0%	22%

5. West Rhudes Creek Watershed (Cecilia)

The West Rhudes Creek Watershed was accepted into the City of Elizabethtown updated planning area. The population projection for the West Rhudes Creek Watershed is given in Appendix F, and the table summarizing the system components required for each alternative and a present worth comparison for each alternative is included in Appendix G.

C. Eastern Service Area–Design Year 2017

Figure 7.03-3 illustrates the proposed collection systems and conveyance alternatives for the Eastern Service Area–Design Year 2017. In each scenario, the property owner would be responsible for the cost to connect to the new trunk sewer. The costs of collector sewers have not been included in these alternative evaluations since they are common to each alternative. Appendix G presents the cost development for the present worth analysis. The following paragraphs discuss the watersheds in the Eastern Service Area.

1. Upper Younger Creek Watershed (Springfield Road Area)

The Upper Younger Creek Watershed was evaluated for the conveyance of wastewater to both the Elizabethtown collection system as well as a new Younger Creek WWTP. A wasteload allocation for the Younger Creek WWTP was not permitted by KDOW, thereby leaving the Elizabethtown collection system as the only feasible alternative.

Table 7.03-6 summarizes the system components required and the total present worth for the Elizabethtown collection alternative for the Upper Younger Creek Watershed.

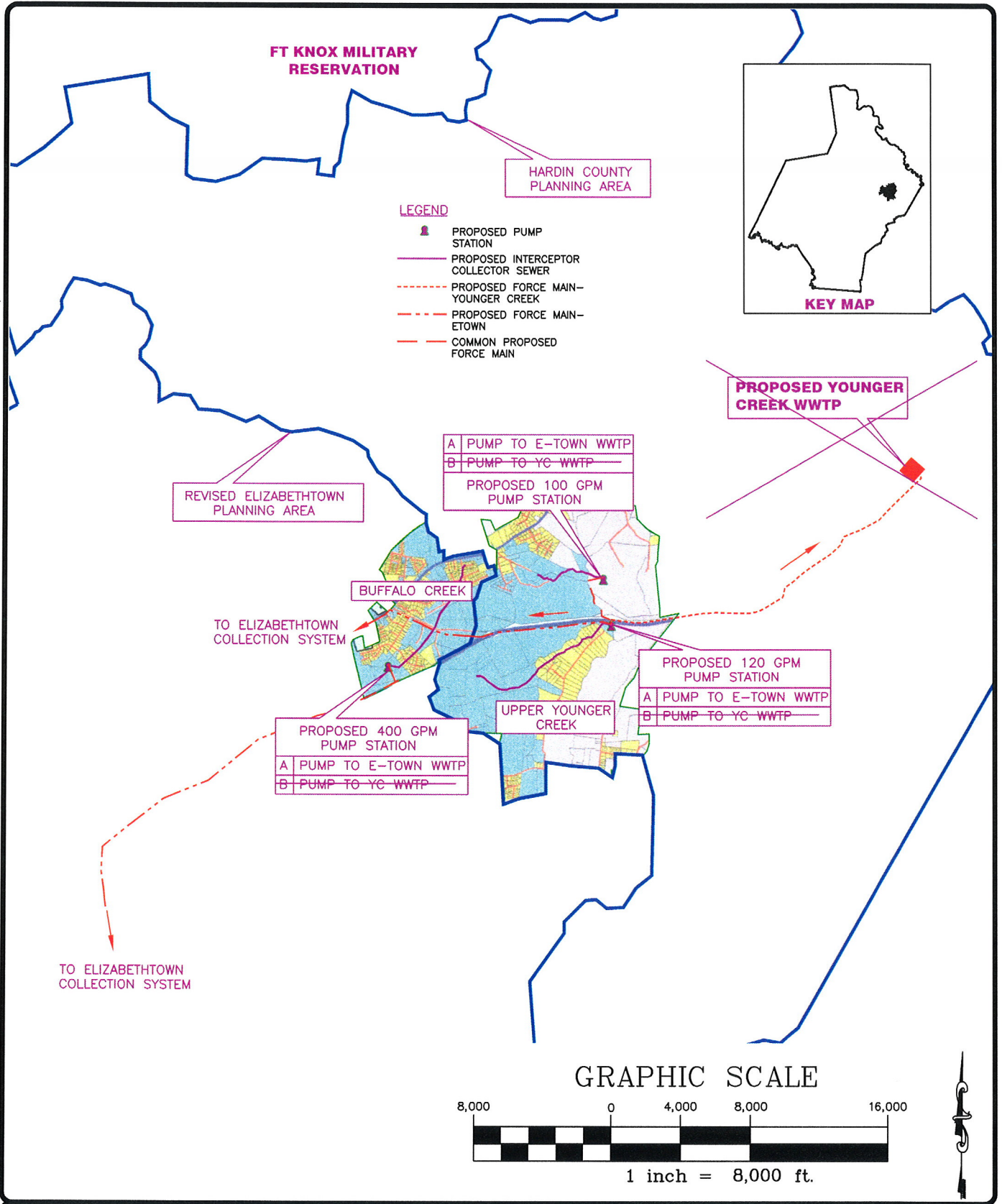
2. Buffalo Creek Watershed (Bardstown Road Area)

The Buffalo Creek Watershed was accepted into the City of Elizabethtown updated planning area. The population projection for the Buffalo Creek Watershed is given in Appendix F, and the table summarizing the system components required for each alternative and a present worth comparison for each alternative is included in Appendix G.

D. Valley Creek Service Area–Design Year 2017

The Valley Creek Watershed was accepted into the City of Elizabethtown updated planning area. The population projection for the Valley Creek Watershed is given in Appendix F, and the table summarizing the system components required for each alternative and a present worth comparison for each alternative is included in Appendix G.

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**DESIGN YEAR 2017 - EASTERN SERVICE AREAS
COLLECTION AND CONVEYANCE ALTERNATIVES**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 7.03-3
JOB NO. 5-980-001

TABLE 7.03-6

EASTERN SERVICE AREA YEAR 2017-UPPER YOUNGER CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives
		Elizabethtown WWTP
Population		1,160
Residential Flow (mgd)		0.116
Industrial Flow (mgd)		
Total Flow (mgd)		0.116
Pumping Stations		
Number		3
Capacity (gpm)		100
		120
		220
Gravity Interceptors (LF)		
	8	14,080
	10	0
	12	0
	15	0
Manholes (number)		56
Force Main (LF)		
	4	3,820
	6	36,800
	8	0
Total Present Worth		
Operation and Maintenance (20 yr)		\$5,197,000
Initial Capital Costs		\$5,281,000
Total Present Worth		\$10,478,000
Percent Greater Than More Cost-Effective Alternative		0%

E. Upton and Sonora Service Area–Design Year 2017 and 2027

The Upton and Sonora Service Area contain the Dorsey Run and Sandy Creek Watersheds. Figure 7.03-4 illustrates the proposed collection systems and conveyance alternatives for the Upton and Sonora Service Area–Design Year 2017 and 2027. In each scenario, the property owner would be responsible for the cost to connect to the new trunk sewer. The costs of collector sewers are not included in these alternative evaluations since they are common to each alternative. Appendix G presents the cost development for the present worth analysis.

1. Dorsey Run and Sandy Creek Watersheds (Upton and Sonora)

Table 7.03-7 summarizes the system components required for each alternative and provides a comparison of the total present worth for each of the alternatives for the Dorsey Run and Sandy Creek Watersheds.

Based on the present worth analysis presented in Table 7.03-7, the Caveland WWTP alternative has a total present worth more than 10 percent less than any other alternative.

The following paragraphs explain the proposed alternatives for Design Year 2027. These alternatives will include the near urban watersheds not included under Design Year 2017. Additionally, any incremental infrastructure needed to handle wastewater flow projections is evaluated for the urban watersheds listed under Design Year 2017. The opinions of cost exclude infrastructure constructed in Design Year 2017.

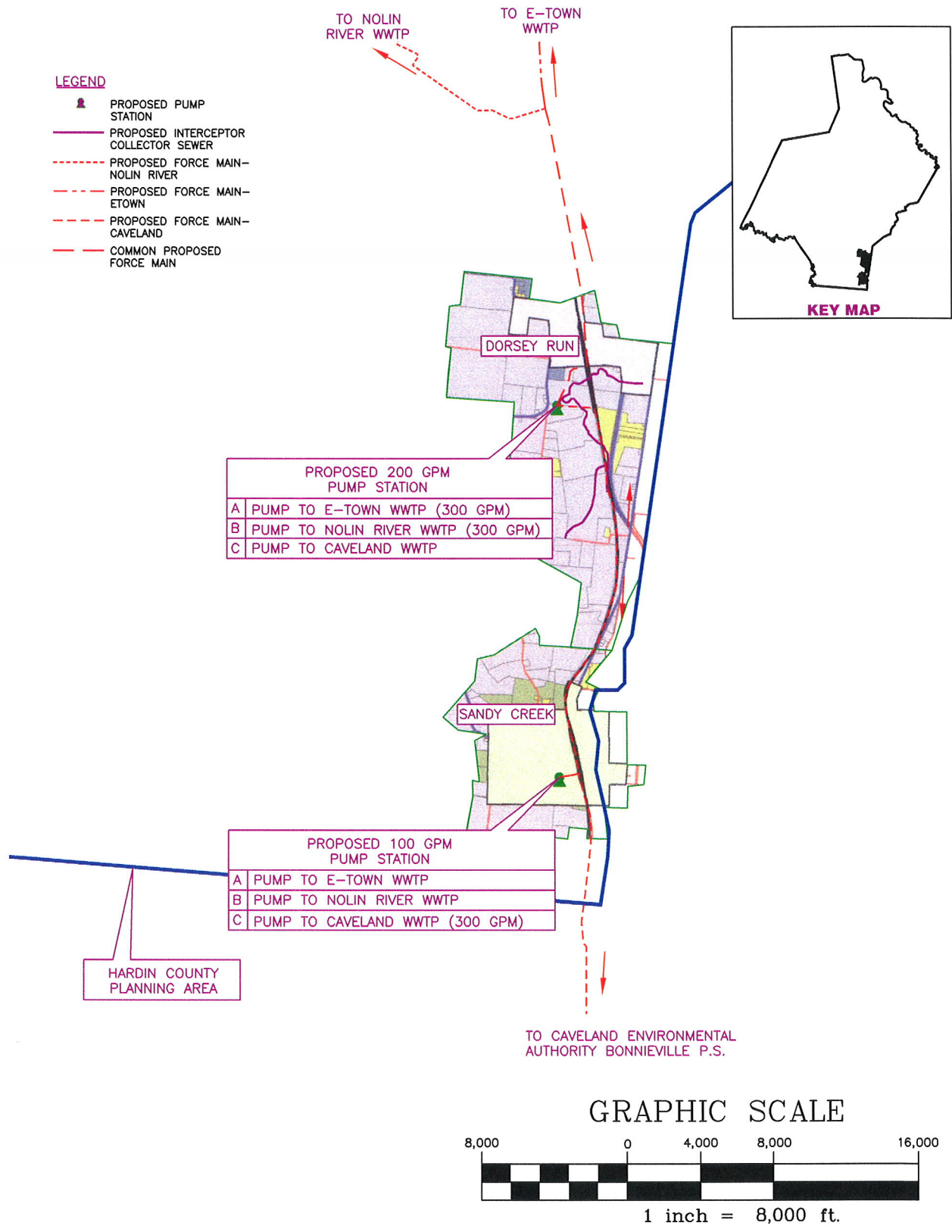
F. Northern Service Area–Design Year 2027

Figure 7.03-5 illustrates the proposed collection systems and conveyance alternatives for the Northern Service Area–Design Year 2027. In each scenario, the property owner would be responsible for the cost to connect to the new trunk sewer. The costs of collector sewers are not included in these alternative evaluations since they are common to each alternative.

1. Pawley Creek and Otter Creek Watersheds (LaVista Estates, Boone Road, and Rineyville)

The Upper Pawley Creek, Pawley Creek, Upper Otter Creek, and Lower Otter Creek Watersheds are included together because wastewater from these watersheds will be conveyed to a common pump station before it is transported to a WWTP. Table 7.03-8 summarizes the system components required for each alternative and provides a comparison of the total present worth for each of the alternatives for the Pawley Creek and Otter Creek Watersheds.

Based on the present worth analysis presented in Table 7.03-8, the Otter Creek WWTP has the lowest total present worth, but if the decision is made to convey wastewater to a Municipal WWTP in the 0- to 10-year time period, this alternative would continue to be utilized through design year 2027 instead of constructing a new WWTP.



**DESIGN YEAR 2017 AND 2027 - UPTON AND SONORA SERVICE AREAS
COLLECTION AND CONVEYANCE ALTERNATIVES**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO.2
HARDIN COUNTY, KENTUCKY**



FIGURE 7.03-4
JOB NO. 5-980-001

TABLE 7.03-7

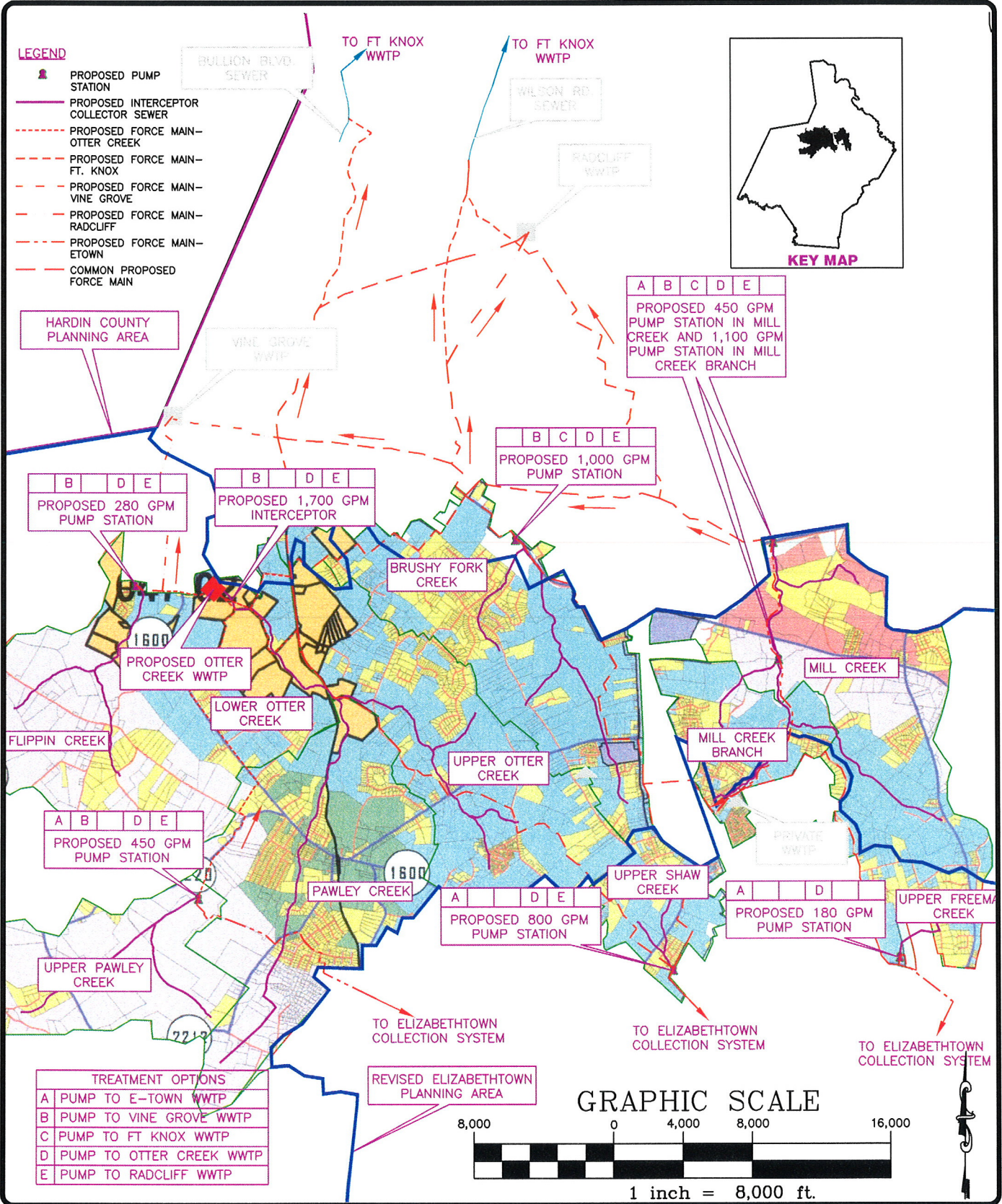
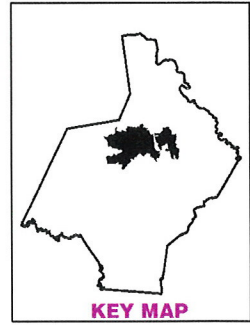
UPTON AND SONORA SERVICE AREA YEAR 2017-DORSEY RUN AND SANDY CREEK WATERSHEDS

	Size (in)	Conveyance and Treatment Alternatives		
		Elizabethtown WWTP	Nolin River WWTP	Caveland WWTP
Population		920	920	920
Residential Flow (mgd)		0.092	0.092	0.092
Industrial Flow (mgd)				
Total Flow (mgd)		0.092	0.092	0.092
Pumping Stations				
Number		3	3	2
Capacity (gpm)		300	300	150
		300	300	180
		100	100	
Gravity Interceptors (LF)				
	8	27,830	27,830	20,830
	10	0	0	0
	12	0	0	0
	15	0	0	0
Manholes (number)		111	111	83
Force Main (LF)				
	4	24,230	24,230	24,230
	6	47,140	46,150	33,700
	8	0	0	0
Total Present Worth				
Operation and Maintenance (20 yr)		\$6,663,000	\$6,358,000	\$5,862,000
Initial Capital Costs		\$7,864,000	\$8,271,000	\$6,204,000
Total Present Worth		\$14,527,000	\$14,629,000	\$12,066,000
Percent Greater Than Most Cost-Effective Alternative		20%	21%	0%

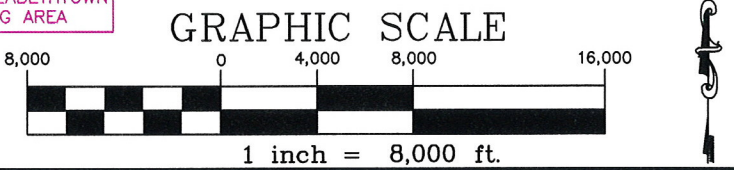
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LEGEND

- PROPOSED PUMP STATION
- PROPOSED INTERCEPTOR COLLECTOR SEWER
- PROPOSED FORCE MAIN - OTTER CREEK
- PROPOSED FORCE MAIN - FT. KNOX
- PROPOSED FORCE MAIN - VINE GROVE
- PROPOSED FORCE MAIN - RADCLIFF
- PROPOSED FORCE MAIN - ETOWN
- COMMON PROPOSED FORCE MAIN



TREATMENT OPTIONS				
A	P	M	P	T
PUMP TO E-TOWN WWTP				
B	P	M	P	T
PUMP TO VINE GROVE WWTP				
C	P	M	P	T
PUMP TO FT KNOX WWTP				
D	P	M	P	T
PUMP TO OTTER CREEK WWTP				
E	P	M	P	T
PUMP TO RADCLIFF WWTP				



**DESIGN YEAR 2027 - NORTHERN SERVICE AREAS
COLLECTION AND CONVEYANCE ALTERNATIVES**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 7.03-5
JOB NO. 5-980-001

TABLE 7.03-8

NORTHERN SERVICE AREA YEAR 2027-PAWLEY CREEK AND OTTER CREEK WATERSHEDS

	Size (in)	Conveyance and Treatment Alternatives			
		Vine Grove WWTP	Fort Knox WWTP	Otter Creek WWTP*	Radcliff WWTP
Population		9,560	9,560	9,560	9,560
Residential Flow (mgd)		0.956	0.956	0.956	0.956
Industrial Flow (mgd)					
Total Flow (mgd)		0.956	0.956	0.956	0.956
Pumping Stations					
Number		2	3	1	3
Capacity (gpm)		1,700	1,700	450	1,700
		450	1,700		1,700
			450		450
Gravity Interceptors (LF)					
	8	16,690	16,690	16,690	16,690
	10	2,880	2,880	2,880	2,880
	18	8,270	8,270	8,270	8,270
	21	2,270	2,270	2,270	2,270
Manholes (number)		120	120	120	120
Force Main (LF)					
	6	6,500	6,500	6,500	6,500
	10	0	0	0	0
	15	13,990	40,750	0	38,530
Total Present Worth					
Operation and Maintenance (20 yr)		\$6,191,000	\$4,685,000	\$2,676,000	\$6,521,000
Initial Capital Costs		\$5,420,000	\$5,916,000	\$3,300,000	\$7,039,000
Total Present Worth		\$11,611,000	\$10,601,000	\$5,976,000	\$13,560,000
Percent Greater Than Most Cost-Effective Alternative		94%	77%	0%	127%

* Assumes infrastructure for same alternative was built in the year 2017.

2. Brushy Fork Creek Watershed (Burns-Deckard School Road)

Table 7.03-9 summarizes the system components required for each alternative and provides a comparison of the total present worth for each of the alternatives for the Brushy Fork Creek Watershed.

Based on the present worth analysis presented in Table 7.03-9, the Fort Knox WWTP alternative has a total present worth more than 10 percent less than any other alternative.

3. Mill Creek Branch (Airview Estates)

Table 7.03-10 summarizes the system components required for each alternative and provides a comparison of the total present worth for each of the alternatives for the Mill Creek Branch Watershed.

Based on the present worth analysis presented in Table 7.03-10, the Elizabethtown collection alternative has the lowest total present worth.

4. Mill Creek

Table 7.03-11 summarizes the system components required for each alternative and provides a comparison of the total present worth for each of the alternatives for the Mill Creek Watershed.

Based on the present worth analysis presented in Table 7.03-11, the Elizabethtown collection alternative has the lowest total present worth, but the Radcliff WWTP alternative is only 4 percent more on a total present worth basis. Since the two alternatives are less than 10 percent different on a total present worth basis, they would be considered equivalent on a monetary basis. Section 7.04 of this report reviews the noneconomic factors for each of these alternatives. The noneconomic factors will be considered in the selection of the most favorable alternative.

Although an “area of concern” is not directly located within the Mill Creek Watershed, it is close to other areas of concern (Airview Estates and Smithersville). The watershed is expected to experience growth, therefore, it was included in wastewater planning.

5. Flippin Creek Watershed

Table 7.03-12 summarizes the system components required for each alternative and provides a comparison of the total present worth for each of the alternatives for the Flippin Creek Watershed.

Based on the present worth analysis presented in Table 7.03-12, the Fort Knox WWTP alternative has the lowest total present worth. No other alternative is within 10 percent of the Fort Knox WWTP alternative.

TABLE 7.03-9

NORTHERN SERVICE AREA YEAR 2027-BRUSHY FORK CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives			
		Vine Grove WWTP	Fort Knox WWTP*	Otter Creek WWTP	Radcliff WWTP
Population		4,270	4,270	4,270	4,270
Residential Flow (mgd)		0.427	0.427	0.427	0.427
Industrial Flow (mgd)					
Total Flow (mgd)		0.427	0.427	0.427	0.427
Pumping Stations					
Number		1	1	1	1
Capacity (gpm)		1,000	1,000	1,000	1,000
Gravity Interceptors (LF)					
	8	0	0	0	0
	10	0	0	0	0
	12	0	0	0	0
	15	0	0	0	0
Manholes (number)		0	0	0	0
Force Main (LF)					
	8	0	0	0	0
	10	0	0	0	0
	12	0	0	0	0
Total Present Worth					
Operation and Maintenance (20 yr)		\$1,075,000	\$470,000	\$485,000	\$863,000
Initial Capital Costs		\$503,000	\$117,000	\$359,000	\$406,000
Total Present Worth		\$1,578,000	\$587,000	\$844,000	\$1,269,000
Percent Greater Than Most Cost-Effective Alternative		169%	0%	44%	116%

* Assumes infrastructure for same alternative was built in the year 2017.

TABLE 7.03-10

NORTHERN SERVICE AREA YEAR 2027-MILL CREEK BRANCH WATERSHED

	Size (in)	Conveyance and Treatment Alternatives				
		Vine Grove WWTP	Fort Knox WWTP	Otter Creek WWTP	Radcliff WWTP	Elizabethtown WWTP*
Population		2,680	2,680	2,680	2,680	2,680
Residential Flow (mgd)		0.268	0.268	0.268	0.268	0.268
Industrial Flow (mgd)						
Total Flow (mgd)		0.268	0.268	0.268	0.268	0.268
Pumping Stations						
Number		2	2	2	2	1
Capacity (gpm)		450	450	450	450	1,100
		1,100	1,100	1,100	1,100	
Gravity Interceptors (LF)						
	8	7,089	7,089	7,089	7,089	7,089
	10	3,240	3,240	3,240	3,240	3,240
	12	0	0	0	0	0
	15	0	0	0	0	0
Manholes (number)		41	41	41	41	41
Force Main (LF)						
	6	46,030	41,610	47,750	36,080	0
	8	0	0	0	0	0
	10	0	0	0	0	0
	12	0	0	0	0	0
Total Present Worth						
Operation and Maintenance (20 yr)		\$1,621,000	\$1,420,000	\$1,449,000	\$546,000	\$622,000
Initial Capital Costs		\$2,458,000	\$2,358,000	\$2,462,000	\$1,934,000	\$855,000
Total Present Worth		\$4,079,000	\$3,778,000	\$3,911,000	\$2,480,000	\$1,477,000
Percent Greater Than Most Cost-Effective Alternative		176%	156%	165%	68%	0%

* Assumes infrastructure for same alternative was built in the year 2017.

TABLE 7.03-11

NORTHERN SERVICE AREA YEAR 2027-MILL CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives				
		Vine Grove WWTP	Fort Knox WWTP	Otter Creek WWTP	Radcliff WWTP	Elizabethtown WWTP
Population		1,670	1,670	1,670	1,670	1,670
Residential Flow (mgd)		0.167	0.167	0.167	0.167	0.167
Industrial Flow (mgd)						
Total Flow (mgd)		0.167	0.167	0.167	0.167	0.167
Pumping Stations						
Number		2	2	2	2	1
Capacity (gpm)		450	450	450	450	450
		450	450	450	450	
Gravity Interceptors (LF)						
	8	11,230	11,230	11,230	11,230	11,230
	10	0	0	0	0	0
	12	2,930	2,930	2,930	2,930	2,930
	15	0	0	0	0	0
Manholes (number)		57	57	57	57	57
Force Main (LF)						
	6	38,280	33,860	40,000	28,330	7,750
	8	0	0	0	0	0
	10	0	0	0	0	0
	12	0	0	0	0	0
Total Present Worth						
Operation and Maintenance (20 yr)		\$2,564,000	\$1,624,000	\$1,747,000	\$1,100,000	\$1,636,000
Initial Capital Costs		\$2,813,000	\$2,268,000	\$2,735,000	\$2,513,000	\$1,838,000
Total Present Worth		\$5,377,000	\$3,892,000	\$4,482,000	\$3,613,000	\$3,474,000
Percent Greater Than Most Cost-Effective Alternative		55%	12%	29%	4%	0%

TABLE 7.03-12

NORTHERN SERVICE AREA YEAR 2027-FLIPPIN CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives			
		Vine Grove WWTP	Otter Creek WWTP	Radcliff WWTP	Fort Knox WWTP
Population		1,060	1,060	1,060	1,060
Residential Flow (mgd)		0.106	0.106	0.106	0.106
Industrial Flow (mgd)					
Total Flow (mgd)		0.106	0.106	0.106	0.106
Pumping Stations					
Number		1	1	2	1
Capacity (gpm)		280	280	280 280	280
Gravity Interceptors (LF)					
	8	18,790	18,790	18,790	18,790
	10	0	0	0	0
	12	0	0	0	0
	15	0	0	0	0
Manholes (number)		75	75	75	75
Force Main (LF)					
	6	12,660	4,700	43,230	4,700
	8	0	0	0	0
	10	0	0	0	0
Total Present Worth					
Operation and Maintenance (20 yr)		\$1,613,000	\$959,000	\$1,914,000	\$911,000
Initial Capital Costs		\$1,904,000	\$1,531,000	\$2,847,000	\$1,304,000
Total Present Worth		\$3,517,000	\$2,490,000	\$4,761,000	\$2,215,000
Percent Greater Than Most Cost-Effective Alternative		52%	11%	115%	0%

Although an “area of concern” is not directly located within the Flippin Watershed, it is close to other areas of concern (Rineyville and LaVista Estates). The watershed is expected to experience growth, therefore, it was included in wastewater planning.

6. Upper Freeman Creek Watershed

The Upper Freeman Creek Watershed was accepted into the City of Elizabethtown updated planning area. The population projection for the Upper Freeman Creek Watershed is given in Appendix F, and the table summarizing the system components required for each alternative and a present worth comparison for each alternative is included in Appendix G.

G. Southern Service Area—Design Year 2027

Figure 7.03-6 illustrates the proposed collection systems and conveyance alternatives for the Southern Service Area—Design Year 2027. In each scenario, the property owner would be responsible for the cost to connect to the new trunk sewer. The costs of collector sewers are not included in these alternative evaluations since they are common to each alternative. Appendix G presents the cost development for the present worth analysis.

1. North Upper Nolin River, Upper Nolin River, Cox Run, Jackson Branch, and Nolin River Watersheds (Glendale Industrial Tract, Gilead Church-Glendale Road)

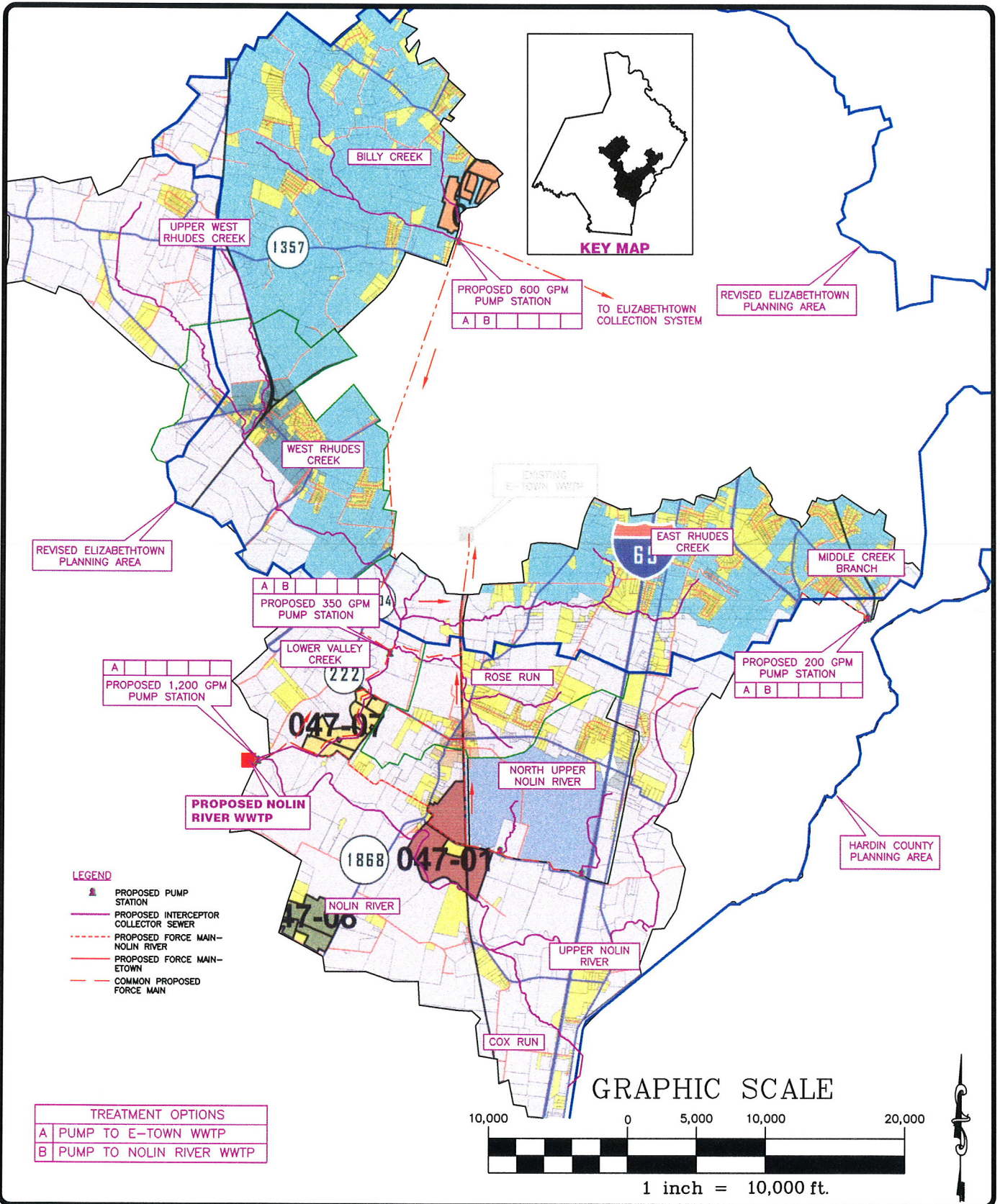
The Upper Nolin River, Cox Run, Jackson Branch, and Nolin River Watersheds are included together for Design Year 2027 because these watersheds convey wastewater to a common pump station for the Elizabethtown WWTP alternative or to the Nolin River WWTP (new southern WWTP) via gravity collection. After an initial analysis, leaving North Upper Nolin River Watershed to convey wastewater (Design Year 2017 selected alternative) was considered more cost-effective than abandoning that infrastructure and upsizing the 2027 gravity infrastructure for this entire area. Table 7.03-13 summarizes the system components required for each alternative and provides a comparison of the total present worth for each of the alternatives.

Based on the present worth analysis presented in Table 7.03-13, the Nolin River WWTP alternative has the lowest total present worth, but if the decision is made to convey wastewater to a Municipal WWTP in the 0-10 year time period, this alternative would continue to be utilized through design year 2027 instead of constructing a new WWTP.

2. Upper West Rhudes Creek, Lower Valley, and Rose Run Watersheds (Glendale)

The Upper West Rhudes Creek, Lower Valley, and Rose Run Watersheds are included together for Design Year 2027 because the topography of these watersheds direct flow to a common area. However, the collection infrastructure in the Upper West Rhudes Creek watershed will most likely convey the wastewater into the West Rhudes Creek watershed (Elizabethtown revised planning area) and ultimately into the Elizabethtown collection system.

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**DESIGN YEAR 2027 - SOUTHERN SERVICE AREAS
COLLECTION AND CONVEYANCE ALTERNATIVES**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 7.03-6
JOB NO. 5-980-001

TABLE 7.03-13

SOUTHERN SERVICE AREA YEAR 2027-NORTH UPPER NOLIN RIVER, UPPER NOLIN RIVER, NOLIN RIVER, COX RUN, AND JACKSON BRANCH WATERSHEDS

	Size (in)	Conveyance and Treatment Alternatives	
		Elizabethtown WWTP	Nolin River WWTP*
Population		1,690	1,690
Residential Flow (mgd)		0.169	0.169
Industrial Flow (mgd)		2.442	2.442
Total Flow (mgd)		2.611	2.611
Pumping Stations			
Number		1	0
Capacity (gpm)		1,200	
Gravity Interceptors (LF)			
	8	14,210	14,210
	10	25,580	25,580
	12	0	0
	15	5,710	5,710
	18	5,580	5,580
	21	15,990	15,990
	24	10,570	10,570
	27	0	0
	30	0	0
	33	0	0
Manholes (number)		311	311
Force Main (LF)			
	8	0	0
	10	0	0
	12	28,630	0
Total Present Worth			
Operation and Maintenance (20 yr)		\$3,981,000	\$2,840,000
Initial Capital Costs		\$7,102,000	\$5,857,000
Total Present Worth		\$11,083,000	\$8,697,000
Percent Greater Than Most Cost-Effective Alternative		27%	0%

* Assumes infrastructure for same alternative was built in the year 2017.

Lower Valley Creek and Rose Run watersheds were still analyzed together to develop the Design Year 2027 alternatives. Table 7.03-14 summarizes the system components required for each alternative and provides a comparison of the total present worth for each of the alternatives. This table includes the collection system components necessary for both the Upper West Rhudes Creek Watershed and Lower Valley Creek and Rose Run Watersheds.

Based on the present worth analysis presented in Table 7.03-14, the Nolin River WWTP alternative has the lowest total present worth, but the Elizabethtown WWTP is only 8 percent more on a total present worth basis. Since the two alternatives are less than 10 percent different on a total present worth basis, they would be considered equivalent on a monetary basis. Section 8.04 of this report reviews the non-economic factors for each of these alternatives. The nonmonetary factors will be considered in the selection of the most favorable alternative.

3. Billy Creek Watershed

The Billy Creek Watershed was accepted into the City of Elizabethtown updated planning area. The population projection for the Billy Creek Watershed is given in Appendix F, and the table summarizing the system components required for each alternative and a present worth comparison for each alternative is given in Appendix G.

H. Eastern Service Area—Design Year 2027

Figure 7.03-7 illustrates proposed collection systems and conveyance alternatives for the Eastern Service Area—Design Year 2027. In each scenario, the property owner would be responsible for the cost to connect to the new trunk sewer. The costs of collector sewers are not included in these alternative evaluations since they are common to each alternative. Appendix G presents the cost development for the present worth analysis.

1. Upper Younger Creek Watershed (Springfield Road Area)

Table 7.03-15 summarizes the system components required and the total present worth for the Elizabethtown collection alternative for the Upper Younger Creek Watershed.

2. Cedar Creek Watershed

Table 7.03-16 summarizes the system components required for each alternative and provides a comparison of the total present worth for each of the alternatives for the Cedar Creek Watershed.

Based on the present worth analysis presented in Table 7.03-16, the Elizabethtown collection alternative has a total present worth more than 10 percent less than any other alternative.

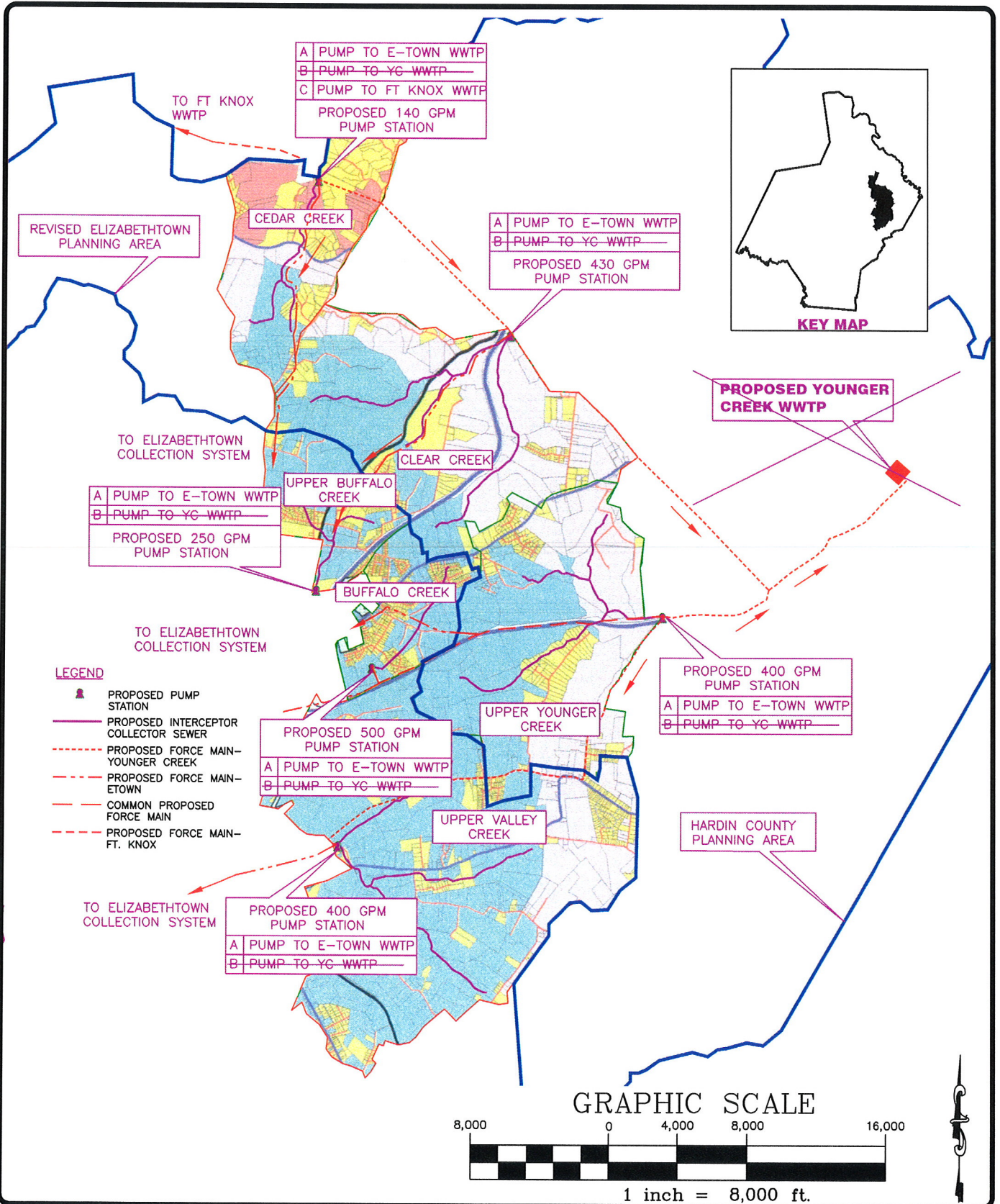
TABLE 7.03-14

SOUTHERN SERVICE AREA YEAR 2027-UPPER WEST RHUDES, LOWER VALLEY CREEK, AND ROSE RUN WATERSHEDS

	Size (in)	Conveyance and Treatment Alternatives	
		Elizabethtown WWTP	Nolin River WWTP*
Population		2,260	2,260
Residential Flow (mgd)		0.226	0.226
Industrial Flow (mgd)			
Total Flow (mgd)		0.226	0.226
Pumping Stations			
Number		1	1
Capacity (gpm)		350	350
Gravity Interceptors (LF)			
	8	35,090	35,090
	10	4,650	4,650
	12	7,230	7,230
	15	0	0
Manholes (number)		188	188
Force Main (LF)			
	6	14,690	15,970
	8	0	0
	10	0	0
Total Present Worth			
Operation and Maintenance (20 yr)		\$1,860,000	\$1,651,000
Initial Capital Costs		\$3,613,000	\$3,429,000
Total Present Worth		\$5,473,000	\$5,080,000
Percent Greater Than Most Cost-Effective Alternative		8%	0%

* Assumes infrastructure for same alternative was built in the year 2017.

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**DESIGN YEAR 2027 - EASTERN SERVICE AREAS
COLLECTION AND CONVEYANCE ALTERNATIVES**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 7.03-7
JOB NO. 5-980-001

TABLE 7.03-15

EASTERN SERVICE AREA YEAR 2027-UPPER YOUNGER CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives
		Elizabethtown WWTP*
Population		1,580
Residential Flow (mgd)		0.158
Industrial Flow (mgd)		
Total Flow (mgd)		0.158
Pumping Stations		
Number		2
Capacity (gpm)		400
		400
Gravity Interceptors (LF)		
	8	6,920
	10	3,940
	12	0
	15	0
Manholes (number)		43
Force Main (LF)		
	4	0
	6	0
	8	0
Total Present Worth		
Operation and Maintenance (20 yr)		\$794,000
Initial Capital Costs		\$1,034,000
Total Present Worth		\$1,828,000
Percent Greater Than Most Cost-Effective Alternative		0%

* Assumes infrastructure for same alternative is built in the year 2017.

TABLE 7.03-16

EASTERN SERVICE AREA YEAR 2027-CEDAR CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives	
		Elizabethtown WWTP	Fort Knox WWTP
Population		500	500
Residential Flow (mgd)		0.05	0.05
Industrial Flow (mgd)			
Total Flow (mgd)		0.05	0.05
Pumping Stations			
Number		1	2
Capacity (gpm)		140	140
Gravity Interceptors (LF)			
	8	14,060	14,060
	10	0	0
	12	0	0
	15	0	0
Manholes (number)		56	56
Force Main (LF)			
	4	19,210	50,080
	6	0	0
	8	0	0
Total Present Worth			
Operation and Maintenance (20 yr)		\$906,000	\$1,219,000
Initial Capital Costs		\$1,545,000	\$2,428,000
Total Present Worth		\$2,451,000	\$3,647,000
Percent Greater Than Most Cost-Effective Alternative		0%	49%

Although an “area of concern” is not directly located within the Cedar Creek Watershed, it is close to other areas of concern (Colesburg). The watershed is expected to experience growth therefore, it was included in wastewater planning.

3. Clear Creek Watershed

The Clear Creek Watershed was evaluated for the conveyance of wastewater to both the Elizabethtown collection system as well as a new Younger Creek WWTP. A wasteload allocation was not provided by KDOW for the Younger Creek WWTP, which resulted in the Elizabethtown collection system being the most desirable alternative.

Table 7.03-17 summarizes the system components required and the total present worth for the Elizabethtown collection alternative for the Clear Creek Watershed.

Although an “area of concern” is not directly located within the Clear Creek Watershed, it is close to other areas of concern (Colesburg). The watershed is expected to experience growth, therefore it was included in wastewater planning.

4. Upper Buffalo Creek Watershed

The Upper Buffalo Creek Watershed was accepted into the City of Elizabethtown updated planning area. The population projection for the Upper Buffalo Creek Watershed is given in Appendix F, and the table summarizing the system components required for each alternative and a present worth comparison for each alternative is included in Appendix G.

5. Upper Valley Creek Watershed

The Upper Valley Creek Watershed was accepted into the City of Elizabethtown updated planning area. The population projection for the Upper Valley Creek Watershed is given in Appendix F, and the table summarizing the system components required for each alternative and a present worth comparison for each alternative is given in Appendix G.

I. Rural Watersheds





Any development that occurs outside of the above 0- to 10-year and 10- to 20-year watersheds (service areas), as shown in Figure 7.03-8, is anticipated to be served by properly designed rural wastewater treatment systems such as recirculating media filters and drip irrigation, etc. These facilities would be designed and constructed in accordance with HCWD2 design standards for wastewater infrastructure. A responsible management utility (HCWD1 or HCWD2) would be responsible for management, operation, and maintenance of these facilities.

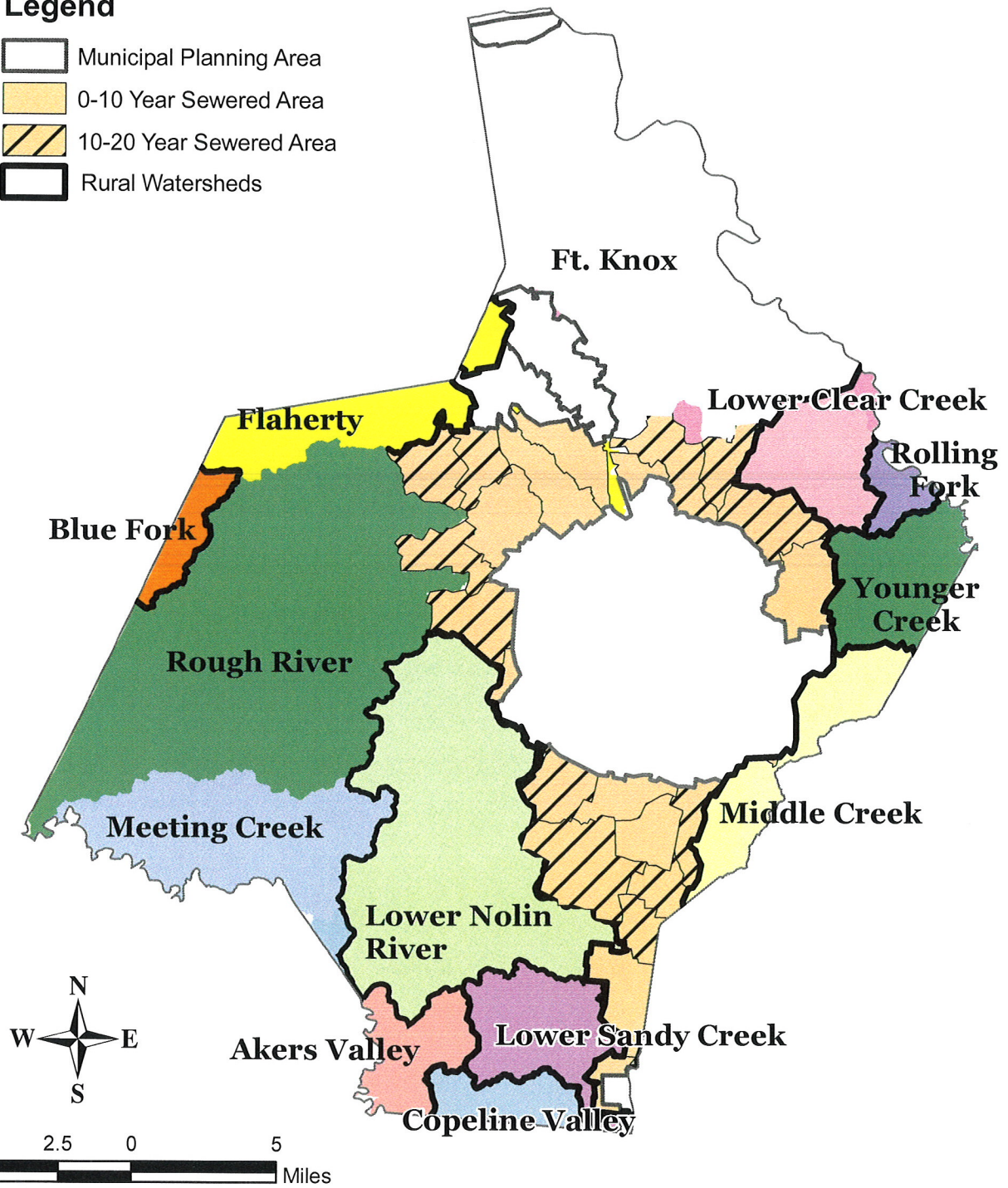
TABLE 7.03-17

EASTERN SERVICE AREA YEAR 2027-CLEAR CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives Elizabethtown Collection
Population		1,690
Residential Flow (mgd)		0.169
Industrial Flow (mgd)		
Total Flow (mgd)		0.169
Pumping Stations		
Number		1
Capacity (gpm)		430
Gravity Interceptors (LF)		
	8	33,120
	10	0
	12	0
	15	0
Manholes (number)		132
Force Main (LF)		
	8	18,890
	10	0
	12	0
Total Present Worth		
Operation and Maintenance (20 yr)		\$2,206,000
Initial Capital Costs		\$3,196,000
Total Present Worth		\$5,402,000
Percent Greater Than Most Cost-Effective Alternative		0%

Legend

-  Municipal Planning Area
-  0-10 Year Sewered Area
-  10-20 Year Sewered Area
-  Rural Watersheds



RURAL WATERSHEDS

REGIONAL WASTEWATER FACILITIES PLAN

HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY



FIGURE 7.03-8
5-980-001

7.04 EVALUATION OF NON-MONETARY FACTORS

The economic analysis considers only the cost implications of each alternative. There are often nonmonetary factors that can influence the selection or rejection of a given alternative. The nonmonetary factors were developed by evaluating the alternatives for the full 20-year planning horizon. The nonmonetary factors for each watershed are given in Appendix H. The nonmonetary factor evaluation will be considered when the monetary costs are within 10 percent of each other

7.05 WASTEWATER TREATMENT ALTERNATIVES

In general, two types of wastewater treatment were evaluated for each sub watershed; one being municipal treatment by an existing WWTP, the other being treatment at a new county WWTP. Five municipal WWTPs were considered for municipal treatment; Fort Knox, Radcliff, Vine Grove, Elizabethtown, and Caveland WWTP. Strand Associates inquired about upgrades and costs necessary for these municipal WWTPs to accept county wastewater flow. See Appendix B for correspondence from these municipal treatment entities. For the proposed county WWTPs, design criteria and costs were developed for an extended aeration, activated sludge WWTP for the 0- to 10-year flow projections, and upgrades in the future to accept the 10- to 20-year flow projections. Table 7.05-1 illustrates the design criteria and costs developed for the county WWTPs (Nolin River and Otter Creek).

Table 7.05-2 illustrates costs for upgrades and wastewater treatment required by the municipal entities to collect and treat county wastewater.

Utility	Terminal Force Main Location	Costs to County	Special Conditions	Volume Charge/1,000 gal
Fort Knox	Wilson Road gate or Bullion Blvd. Gate	Share in cost to upsize lines	Subject to PSC approval	\$2.00
Radcliff	WWTP	New WWTP Headworks	Capacity Charge \$1,000/customer	\$4.10
Vine Grove	WWTP	Build WWTP Capacity		\$5.00
Elizabethtown	Varies by area		Capacity charge \$1,500/customer for conveyance; \$500/customer for WWTP	\$3.35 (soon)
Caveland	Bonnieville PS	Provide equalization to limit PHF to 180 gpm		\$4.54

Table 7.05-2 Upgrades and Costs for Municipal Systems

TABLE 7.05-1

NEW COUNTY WWTP DESIGN CRITERIA AND COSTS

Item	Otter Creek		Nolin River		
	Initial 1 MGD	Expand to 2 MGD	Initial 2 MGD	Expand to 3 MGD	
Influent Pumping	\$300,000	\$50,000	\$350,000	\$75,000	
Screening	\$215,000	\$100,000	\$310,000	\$100,000	
Grit Removal	\$270,000	-	\$325,000	-	
Oxidation Ditch	\$900,000	\$900,000	\$1,700,000	\$850,000	
Final Clarifiers	\$540,000	\$270,000	\$680,000	\$340,000	
RAS/WAS/S Pumping	\$200,000	\$75,000	\$300,000	\$80,000	
UV Disinfection	\$225,000	\$75,000	\$300,000	\$75,000	
Post aeration, Sampling, Metering	\$50,000	\$20,000	\$60,000	\$30,000	
Sludge Handling	\$525,000	\$200,000	\$725,000	\$200,000	
Subtotal	\$3,225,000	\$1,690,000	\$4,750,000	\$1,750,000	
Site Work	5%	\$161,000	\$85,000	\$238,000	\$88,000
Piping	15%	\$484,000	\$254,000	\$713,000	\$263,000
Electrical & Controls	20%	\$645,000	\$338,000	\$950,000	\$350,000
HVAC & Plumbing	3%	\$97,000	\$51,000	\$143,000	\$53,000
Misc metals	2%	\$65,000	\$34,000	\$95,000	\$35,000
Painting	1%	\$32,000	\$17,000	\$48,000	\$18,000
Subtotal		\$4,709,000	\$2,469,000	\$6,937,000	\$2,557,000
Admin/Lab Building		\$200,000	-	\$250,000	-
Land		\$200,000	-	\$250,000	-
TOTAL		\$5,109,000	\$2,469,000	\$7,437,000	\$2,557,000
Cost per gpd capacity		\$5.11	\$2.47	\$3.72	\$2.56
Ultimate Capacity cost per gpd			\$3.79		\$3.33

A. “All or Nothing” County Treatment Approach

In the selection of alternatives, an “all or nothing” county treatment approach was considered. The “all or nothing” approach focused on either providing the majority of watersheds in a service area with wastewater conveyance and treatment at a new county WWTP or providing conveyance to an existing municipal WWTP based on present worth analysis and nonmonetary factors, where applicable. With cost playing a major role in the selection of the “all or nothing” approach, the lowest present worth for each municipal alternative was totaled and compared to the present worth of the County WWTP alternative for the same watersheds. This analysis was completed for the 0- to 10-year alternatives and for the 0- to 10-year added to the 10- to 20-year alternatives to determine the most economical solution within 10 years and within 20 years. The following paragraphs illustrate the results of this analysis

B. Northern Service Area

Tables 7.05-3 and 7.05-4 illustrate the capital costs and present worth of conveyance and treatment at a municipal WWTP as compared to a new county Otter Creek WWTP for the Northern Service Area watersheds.

Watershed	Municipal Treatment			County Treatment	
	Location	Capital Cost	Present Worth (0-10 year alternative–20 year present worth)	Otter Creek WWTP Capital Costs	WWTP Present Worth (0- 10 year alternative–20 year present worth)
Brushy Fork Creek	Fort Knox	\$5,866,000	\$12,736,000	\$8,679,000	\$17,124,000
Mill Creek Branch	Elizabethtown	This watershed was assumed to be treated by Elizabethtown, so it is excluded from the comparison.			
Pawley Creek and Otter Creek	Fort Knox	\$8,204,000	\$18,819,000	\$9,693,000	\$20,258,000
Total		\$14,070,000	\$31,555,000	\$18,372,000	\$37,382,000

Table 7.05-3 10-Year Planning Horizon “All or Nothing” Cost Summary–Northern Service Area

Watershed	Municipal Treatment			County Treatment	
	Location	Capital Cost	Present Worth (0-10+10-20 year)	Otter Creek WWTP Capital Costs	WWTP Present Worth (0-10+10-20 year)
Brushy Fork Creek	Fort Knox	\$5,983,000	\$13,323,000	\$9,038,000	\$17,968,000
Mill Creek Branch	Elizabethtown	These two watersheds were assumed to be treated by Elizabethtown, so they are excluded from the comparison.			
Mill Creek	Elizabethtown				
Flippin Creek	Fort Knox	\$1,304,000	\$2,215,000	\$1,531,000	\$2,490,000
Pawley Creek and Otter Creek	Fort Knox	\$14,120,000	\$29,420,000	\$12,993,000	\$26,234,000
Total		\$21,407,000	\$44,958,000	\$23,562,000	\$46,692,000

**Table 7.05-4 20-Year Planning Horizon “All or Nothing” Cost Summary
Northern Service Area**

The alternative evaluations for the Mill Creek Branch and Mill Creek Watersheds greatly favored municipal treatment, therefore, the economic contribution of these watersheds is excluded from the cost summary for the 0- to 10-year and the 10- to 20- year cost summary table in order to consider only those watersheds that would possibly be treated by a new Otter Creek WWTP.

The “all or nothing” county treatment evaluation of the Northern Service Area favors the municipal treatment alternative in the 10-year horizon and can be considered essentially equal in the 20-year horizon. The ability to attract grant funding by pursuing the more regional (municipal) solution would favor treatment by municipal entities as the preferred alternative.

Tables 7.05-5 and 7.05-6 illustrate that considering only the 0- to 10-year planning horizon, the most economical choice is municipal treatment in the southern service area. However, if the full 20-year planning horizon is considered, it is nearly as cost effective to initially construct a new Nolin River WWTP to provide wastewater treatment to the southern service area.

Watershed	Municipal Treatment			County Treatment	
	Location	Capital Cost	Present Worth (0-10 Year Alternative-20 Year Present Worth)	Nolin River WWTP Capital Costs	Nolin River WWTP Present Worth (0-10 Year Alternatives-20 Year Present Worth)
North Upper Nolin River	Elizabethtown	\$16,043,000	\$66,193,000	\$28,316,000	\$71,095,000
Rose Run	Elizabethtown	\$2,446,000	\$5,147,000	\$3,409,000	\$6,261,000
Dorsey Run and Sandy Creek	Caveland	\$6,204,000	\$12,066,000	\$8,271,000	\$14,629,000
Total		\$24,693,000	\$83,406,000	\$39,996,000	\$91,985,000

Table 7.05-5 10-Year “All or Nothing” Cost Summary–Southern Service Area

Watershed	Municipal Treatment			County Treatment	
	Location	Capital Cost	Present Worth (0-10+10-20 year)	Nolin River WWTP Capital Costs	Nolin River WWTP Present Worth (0-10+10-20 year)
Dorsey Run and Sandy Creek	Caveland	\$6,204,000	\$12,066,000	\$8,271,000	\$14,629,000
Nolin River, Cox Run, and Jackson Branch	Elizabethtown	\$23,145,000	\$77,276,000	\$34,173,000	\$79,792,000
Rose Run and Lower Valley	Elizabethtown	\$6,059,000	\$10,620,000	\$6,838,000	\$11,341,000
Total		\$35,408,000	\$99,962,000	\$49,282,000	\$105,762,000

Table 7.05-6 20-Year Planning Horizon “All or Nothing” Cost Summary Southern Service Area

7.06 SELECTION OF ALTERNATIVES

A. Northern Service Area

The selected alternatives are based primarily on the economic evaluation, and when the economic evaluation presents two or more alternatives within 10 percent, nonmonetary factors are considered. The following paragraphs discuss the selected alternatives for the watersheds in the Northern Service Area.

1. Brushy Fork Creek (Burns-Deckard School Road Area)

The present worth cost opinion to convey wastewater from the Brushy Fork Creek watershed to the Fort Knox WWTP is at least 34 percent less than all other alternatives, as shown in Table 7.03-2. Conveying wastewater to the Fort Knox WWTP is the most cost effective and is the

selected alternative for the Brushy Fork Creek watershed.

2. Pawley Creek and Otter Creek (LaVista Estates, Boone Road area, and Rineyville)

The present worth cost opinion to convey wastewater from the Pawley Creek and Otter Creek watershed to the Fort Knox WWTP is 8 percent less than conveying wastewater to the proposed Otter Creek WWTP during the 0- to 10-year planning horizon as shown in Table 7.03-2. However, in the 10- to 20-year planning horizon, conveying wastewater to the Otter Creek WWTP is the most cost effective. Considering the economic evaluation in the 0- to 10-year planning horizon, the nonmonetary factors (Appendix H), and that population projections may not occur as predicted, the Fort Knox WWTP is the selected alternative for the Pawley Creek and Otter Creek watersheds. Although the Otter Creek WWTP is the most cost effective alternative in the 10- to 20-year planning horizon, selecting the Fort Knox WWTP during the 0- to 10-year planning horizon means this alternative would continue to be utilized from 10 to 20 years.

3. Mill Creek Branch (Airview Estates)

The present worth cost opinion to convey wastewater from the Mill Creek Branch watershed to the Elizabethtown collection system and on to the Elizabethtown WWTP is at least 14 percent less than all other alternatives, as shown in Table 7.03-3. Conveying wastewater to the Elizabethtown WWTP is the most cost effective and is the selected alternative for the Mill Creek Branch watershed.

4. Mill Creek

The present worth cost opinion to convey wastewater from the Mill Creek watershed to the Elizabethtown collection system and on to the Elizabethtown WWTP is 4 percent less than conveying wastewater to the Radcliff WWTP, as shown in Table 7.03-11. The nonmonetary factors (Appendix H) indicate that conveying wastewater to the Elizabethtown collection system is more favorable than the Radcliff WWTP. Conveying wastewater to the Elizabethtown collection system and on to the Elizabethtown WWTP is the selected alternative for the Mill Creek watershed.

5. Flippin Creek

The present worth cost opinion to convey wastewater from the Flippin Creek watershed to the proposed Fort Knox WWTP is at least 11 percent less than all other alternatives, as shown in Table 7.03-12. Conveying wastewater to the Fort Knox WWTP is the most cost effective and is the selected alternative for the Flippin Creek watershed.

B. Southern Service Area

The following paragraphs discuss the selected alternatives for the watersheds in the Southern Service Area.

1. Rose Run (Glendale)

The present worth cost opinion to convey wastewater from the Rose Run watershed to the Elizabethtown WWTP is 22 percent less than conveying wastewater to the Nolin River WWTP, as shown in Table 7.03-5. Conveying wastewater to the Elizabethtown WWTP is the most cost effective and is the selected alternative for the Rose Run watershed.

2. Rose Run and Lower Valley Creek (Glendale)

The present worth cost opinion to convey wastewater from the Rose Run and Lower Valley Creek watersheds to the proposed Nolin River WWTP is 8 percent less than conveying wastewater to the Elizabethtown WWTP in the 10- to 20-year planning horizon as shown in Table 7.03-14. Considering the economic evaluation in the 0- to 10-year planning horizon, the nonmonetary factors (Appendix H), and that population projections may not occur as predicted, the Elizabethtown WWTP is the selected alternative for the Rose Run and Lower Valley Creek watersheds. Although the Nolin River WWTP is the most cost effective alternative in the 10- to 20-year planning horizon, the Nolin River WWTP would not be constructed based on the 2017 analysis and therefore is not available as an alternative.

3. North Upper Nolin River (Gilead Church—Glendale Road area, Glendale Industrial Tract)

The present worth cost opinion to convey wastewater from the North Upper Nolin River watershed to the Elizabethtown WWTP is 7 percent less than conveying wastewater to the Nolin River WWTP, as shown in Table 7.03-4. The nonmonetary factors (Appendix H) show that conveying wastewater to the Elizabethtown WWTP is slightly more favorable than conveying wastewater to the proposed Nolin River WWTP. The North Upper Nolin River watershed is expected to receive an industrial tenant in the future that may produce a considerable amount of wastewater flow. Conveying wastewater to the Elizabethtown WWTP is the selected alternative for the North Upper Nolin River watershed; however, this alternative may be revisited in the future once the industrial tenant is known.

4. Nolin River, Cox Run, and Jackson Branch (Gilead Church—Glendale Road area, Glendale Industrial Tract)

The present worth cost opinion to convey wastewater from the Nolin River, Cox Run, and Jackson Branch watersheds to the proposed Nolin River WWTP is 27 percent less than conveying wastewater to the Elizabethtown WWTP in the 10- to 20-year planning horizon as shown in Table 7.03-13. Considering the economic evaluation in the 0- to 10-year planning horizon, the nonmonetary factors (Appendix H), the “all or nothing” evaluation, and that

population projections may not occur as predicted, the Elizabethtown WWTP is the selected alternative for the Nolin River, Cox Run, and Jackson Branch watersheds. Although the Nolin River WWTP is the most cost-effective alternative in the 10- to 20-year planning horizon, the Nolin River WWTP would not be constructed based on the 2017 analysis and therefore is not available as an alternative.

C. Eastern Service Area

A county-owned treatment alternative was not permissible by KDOW. Alternatives for the Eastern Service Area were developed based on 0- to 10-year and 10- to 20-year projected wastewater needs. The Eastern Service Area includes the Upper Younger Creek (0- to 10- year), Clear Creek (10- to 20-year), and Cedar Creek (10- to 20-year) watersheds. These watersheds were evaluated to either be served by the Elizabethtown WWTP or served by a new Younger Creek WWTP. The wasteload allocation was not permitted by KDOW for the Younger Creek WWTP; therefore, the selected alternative for the Eastern Service Area watersheds is conveyance to the Elizabethtown collection system and treatment at the Elizabethtown WWTP.

D. Upton and Sonora Service Area

The plan did not consider a county-owned treatment plant for these areas. The Upton and Sonora Service Area, which includes the Dorsey Run and Sandy Creek watersheds, was evaluated to be served by the Elizabethtown WWTP, Caveland WWTP, or a new Nolin River WWTP. The Dorsey Run and Sandy Creek watersheds were assumed to reach the maximum projected population during the 0- to 10-year planning horizon. The present worth cost opinion to convey wastewater from the Dorsey Run and Sandy Creek watersheds to the Bonnierville Intermediate Pump Station and on to the Caveland WWTP is at least 20 percent less than all other alternatives, as shown in Table 7.03-7. Conveying wastewater to the Bonnierville Intermediate Pump Station and on to the Caveland WWTP is the most cost effective and is the selected alternative for the Dorsey Run and Sandy Creek watersheds.

E. Rural Watersheds

Any development within the rural watersheds shown in Figure 7.03-8 will be serviced by cluster-type systems designed and constructed in accordance with HCWD2 standards. A responsible management entity (HCWD1 or HCWD2) will be responsible for management, operation, and maintenance.

**SECTION 8
RECOMMENDED PLAN**

8.01 RECOMMENDED PLAN

The evaluation of the Hardin County collection, conveyance and treatment systems included the assessment of 74 conveyance and treatment alternatives in 31 watersheds. Since the initiation of this facilities plan, the City of Elizabethtown has expanded their planning area to include 10 entire watersheds and portions of three others. The alternatives were considered based on topography and relative location of existing WWTPs. Cost opinions of alternatives were developed for each watershed and nonmonetary factors were considered when the economic evaluation showed that any alternatives were within 10 percent of each other on a monetary basis. All capital cost opinions are shown in 2007 dollars, and the capital cost opinion during 10 to 20 years is the incremental cost to develop additional infrastructure during the 10- to 20- year planning horizon. The recommended alternatives are established based on the five service areas within the Hardin County planning area. The municipal treatment options were based on vicinity and capacity of existing WWTPs, and the new proposed WWTP was selected based on location and wasteload allocations for the receiving stream.

A. Northern Service Area

The Northern Service Area includes the Brushy Fork Creek (0- to 10-year and 10- to 20-year), Mill Creek Branch, (0- to 10-year), Mill Creek (10- to 20-year), Pawley Creek and Otter Creek (0- to 10-year and 10- to 20-year), and Flippin Creek (10- to 20-year) subwatersheds. These subwatersheds were evaluated to either be served by an existing municipal WWTP or a new Otter Creek WWTP. Table 8.01-1 illustrates the recommended alternatives for the Northern Service Area. Figure 8.01-1 and Figure 8.01-5 illustrate collection, pumping, and routing for the Recommended Plan for the 2017 and 2027 Northern Service Areas.

B. Southern Service Area

The Southern Service Area includes the North Upper Nolin River (0 to 10 year and 10 to 20 year), Rose Run (0 to 10 year and 10 to 20 year), Cox Run (10 to 20 year), Jackson Branch (10 to 20 year), Nolin River (10 to 20 year), Upper West Rhudes (10 to 20 year), and Lower Valley Creek (10 to 20 year) subwatersheds. These subwatersheds were evaluated to either be served by an existing municipal WWTP or a new Nolin River WWTP. Table 8.01-2 illustrates the recommended plan for the Southern Service Area. Figure 8.01-2 and Figure 8.01-6 illustrates collection, pumping, and routing for the Recommended Plan for the 2017 and 2027 Southern Service Areas.

C. Eastern Service Area

The Eastern Service Area includes the Upper Younger Creek (0 to 10 year), Clear Creek (10 to 20 year), and Cedar Creek (10 to 20 year) watersheds. These watersheds were evaluated to either be served by the Elizabethtown WWTP or served by a new Younger Creek WWTP. The wasteload allocation was not permitted by KDOW for the Younger Creek WWTP; therefore, it is recommended that the Eastern Service area watersheds construct infrastructure to convey wastewater to the existing Elizabethtown collection system for treatment at the Elizabethtown WWTP.

TABLE 8.01-1

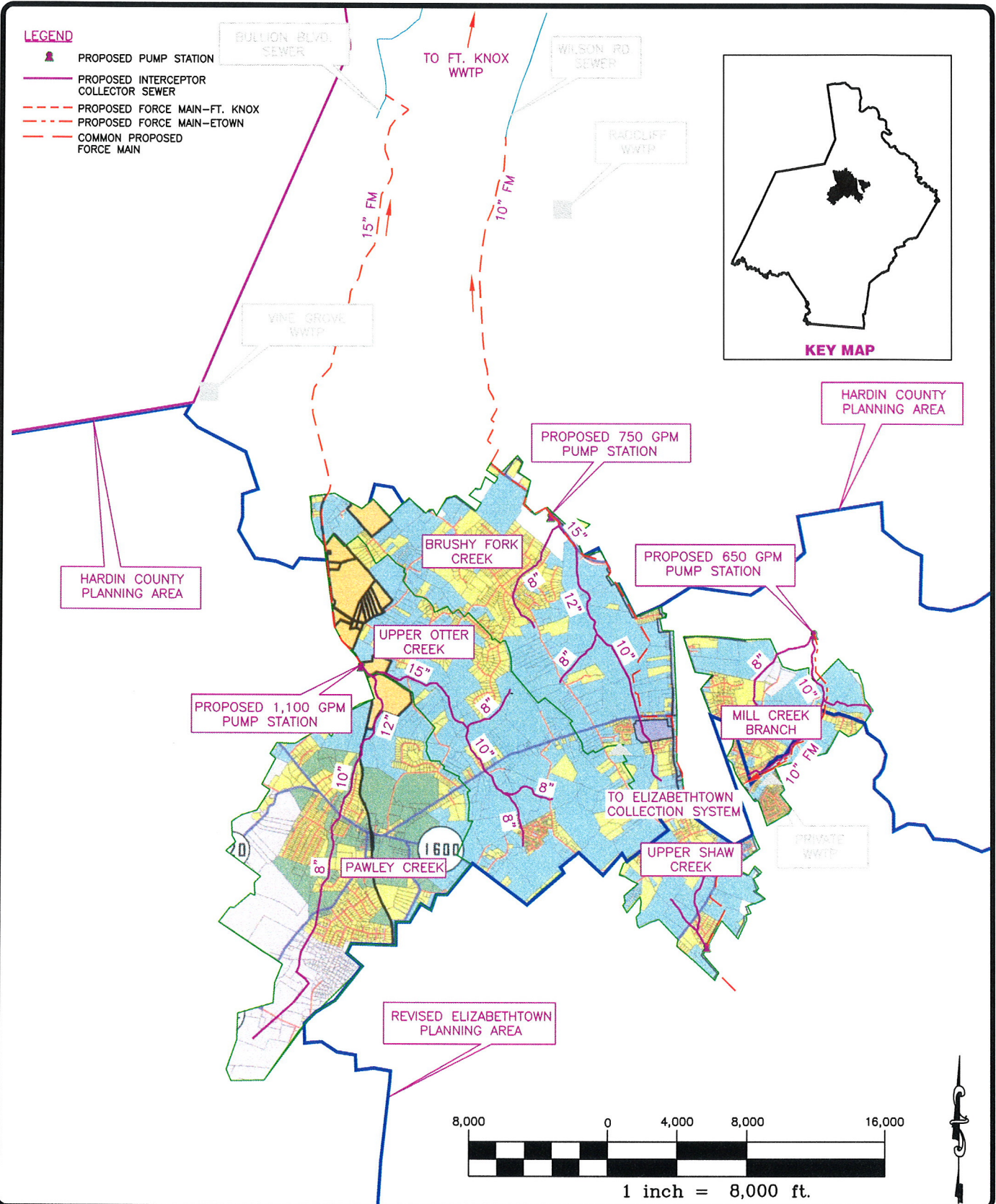
NORTHERN SERVICE AREA RECOMMENDED PLAN

Subwatershed	Area of Concern	Wastewater Flow (mgd)			Recommended Plan	Capital Cost Opinion ⁽¹⁾ (0 to 10 year)	Capital Cost Opinion ⁽¹⁾ (10 to 20 year)
		2003	2017	2027			
Brushy Fork Creek	Burns-Deckard School Road Area	0.22	0.31	0.43	Collect wastewater through 8,10,12, and 15-inch trunk sewers to a regional 750 gpm pump station with 10-inch force main to the Wilson Road sewer for treatment at the Ft. Knox WWTP in the 0-10 year planning horizon. Utilize existing infrastructure and upgrade pump station to a 1,000 gpm pump station in the 10-20 year planning horizon.	\$5,866,000	\$117,000
Pawley Creek and Otter Creek	LaVista Estates, Boone Road area, and Rineyville	0.43	0.47	0.96	Collect wastewater through 8,10,12, and 15-inch trunk sewers, to a regional 1,100 gpm pump station with 15-inch force main to the Bullion Blvd. sewer for treatment at the Ft. Knox WWTP in the 0-10 year planning horizon. In the 10-20 year planning horizon, abandon the existing pump station and utilize existing trunk sewers, and construct additional 8,10, 18 and 21-inch trunk sewers to flow by gravity to a 1,700 gpm regional pump station at the location of the proposed Otter Creek WWTP. Utilize the existing 15-inch force main to the Bullion Blvd. sewer for treatment at the Ft. Knox WWTP.	\$8,204,000	\$5,916,000
Mill Creek Branch	Airview Estates	0.20	0.23	0.27	Collect wastewater through 8 and 10-inch trunk sewers to a regional 650 gpm pump station with a 10-inch force main to the Elizabethtown collection system for treatment at the Elizabethtown WWTP in the 0-10 year planning horizon. In the 10-	\$5,220,000	\$855,000

Subwatershed	Area of Concern	Wastewater Flow (mgd)			Recommended Plan	Capital Cost Opinion ⁽¹⁾ (0 to 10 year)	Capital Cost Opinion ⁽¹⁾ (10 to 20 year)
		2003	2017	2027			
					20 year planning horizon, utilize the existing trunk sewers and construct new 8 and 10-inch trunk sewers. Upgrade the pump station capacity to 1,100 gpm and utilize existing force main to the Elizabethtown collection system for treatment at the Elizabethtown WWTP.		
Mill Creek		0.11	0.14	0.17	Collect wastewater through 8 and 12-inch trunk sewers to a regional 450 gpm pump station with a 6-inch force main to the 1,100 gpm Mill Creek Branch pump station. The existing 10-inch force main to the Elizabethtown collection system will be utilized and treatment will be provided at the Elizabethtown WWTP.	N/A	\$1,838,000
Flippin Creek		0.03	0.07	0.11	Collect wastewater through 8-inch trunk sewer to the regional 1,700 gpm pump station at the location of the proposed Otter Creek WWTP. Utilize the existing 15-inch force main to the Bullion Blvd. Sewer with treatment at the Fort Knox WWTP.	N/A	\$1,304,000
Total		1.00	1.22	1.92		\$19,290,000	\$10,030,000

⁽¹⁾Does not include cost of collector sewers.

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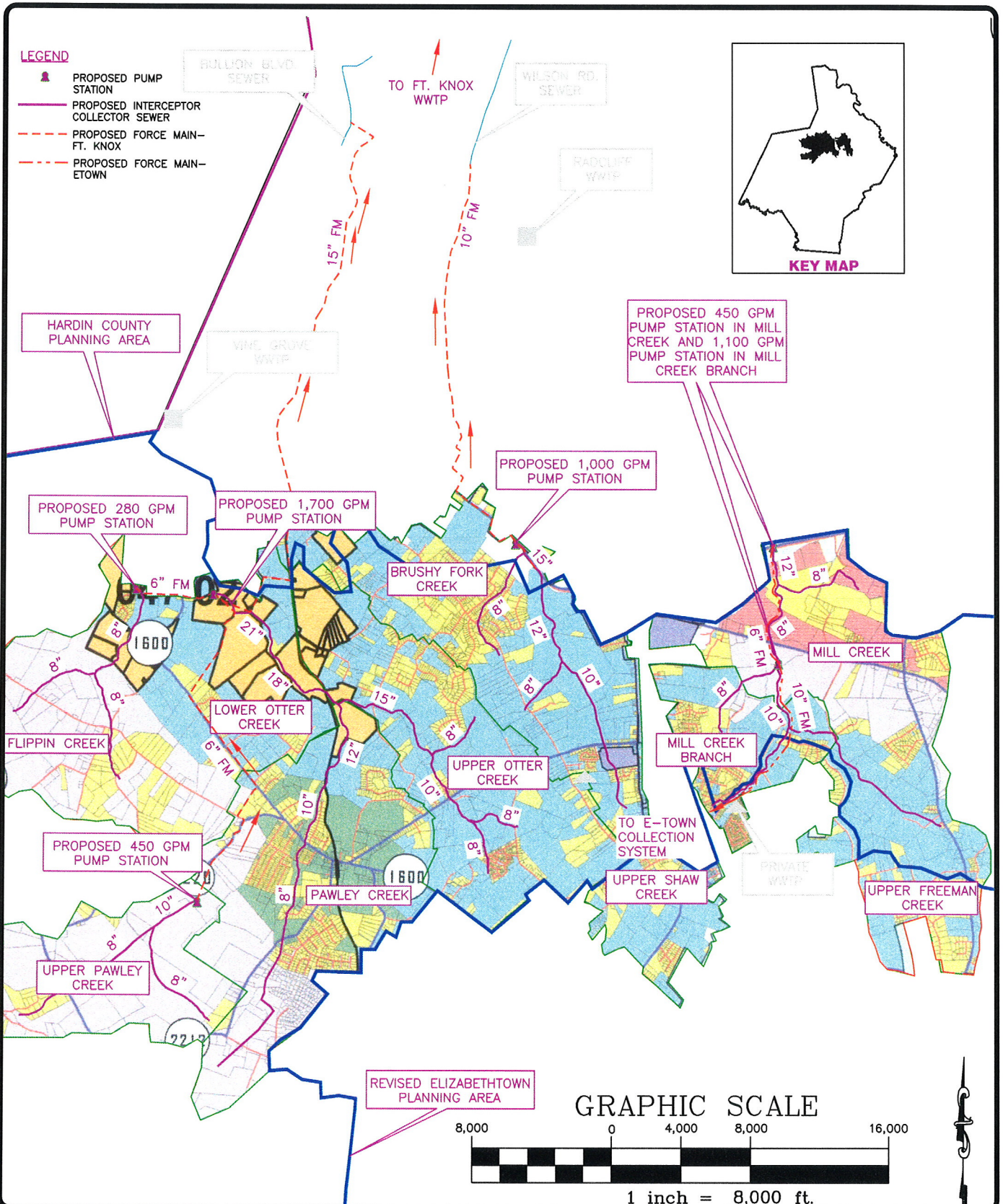
**DESIGN YEAR 2017 - NORTHERN SERVICE AREAS
RECOMMENDED PLAN**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 8.01-1
JOB NO. 5-980-001

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**DESIGN YEAR 2027 - NORTHERN SERVICE AREAS
RECOMMENDED PLAN**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 8.01-5
JOB NO. 5-980-001

TABLE 8.01-2





SOUTHERN SERVICE AREA RECOMMENDED PLAN

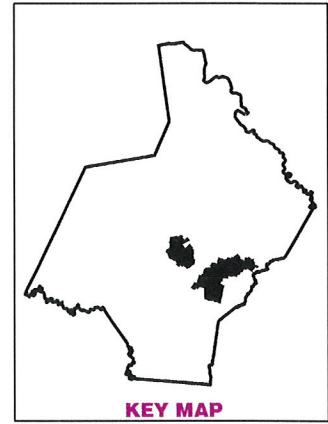
Subwatershed	Area of Concern	Wastewater Flow (mgd)			Recommended Plan	Capital Cost Opinion ⁽¹⁾ (0 to 10 Year)	Capital Cost Opinion ⁽¹⁾ (10 to 20 Year)
		2003	2017	2027			
Rose Run	Glendale	0.05	0.08	-	Collect wastewater through 8-inch trunk sewer to a regional 200 gpm pump station with a 6-inch force main to the Elizabethtown WWTP.	\$2,446,000	N/A
Rose Run, Lower Valley Creek, Upper West Rhudes Creek (partial)	Glendale	0.71	-	0.23	Collect wastewater through existing 8-inch trunk sewer and construct additional 8, 10, and 12-inch trunk sewers. The existing 200 gpm pump station will be abandoned and wastewater will flow by gravity to a new 350 gpm pump station with a 6-inch force main to the Elizabethtown WWTP. Trunk sewers in the Upper West Rhudes Creek will flow in the Elizabethtown collection system for treatment at the Elizabethtown WWTP.	N/A	\$3,613,000
North Upper Nolin River	Gilead Church-Glendale Road Area, Glendale Industrial Tract	0.02	2.48		Collect wastewater through 10 and 15-inch trunk sewers to regional 4,500 gpm pump stations with 18-inch force main to the Elizabethtown WWTP.	\$16,043,000	N/A
Nolin River, Cox Run, Jackson Branch	Gilead Church-Glendale Road Area, Glendale Industrial Tract	0.10	-	2.61	Utilize existing 10- and 15-inch trunk sewers with 4,500 gpm pump stations for the Glendale Industrial tract. Construct additional 8, 10, 15, 18, 21, and 24-inch trunk sewers with gravity flow to a new 1,200 gpm pump station at the location of the proposed Nolin River WWTP. Construct a 12-inch force main to the Elizabethtown WWTP.	N/A	\$7,102,000
Total		0.88	2.56	2.84		\$18,489,000	\$10,715,000

⁽¹⁾Does not include cost of collector sewers.

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LEGEND

-  PROPOSED PUMP STATION
-  PROPOSED INTERCEPTOR COLLECTOR SEWER
-  PROPOSED FORCE MAIN - ETOWN
-  COMMON PROPOSED FORCE MAIN



FUTURE GRAVITY SERVICE INTO ELIZABETHTOWN

REVISED ELIZABETHTOWN PLANNING AREA

WEST RHUDES CREEK

EXISTING E-TOWN WWTP

EAST RHUDES CREEK

MIDDLE CREEK BRANCH

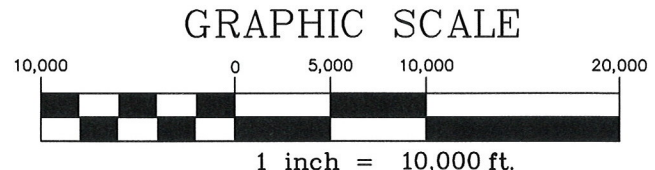
PROPOSED 200 GPM PUMP STATION

ROSE RUN

NORTH UPPER NOLIN RIVER

HARDIN COUNTY PLANNING AREA

PROPOSED 4,500 GPM PUMP STATIONS



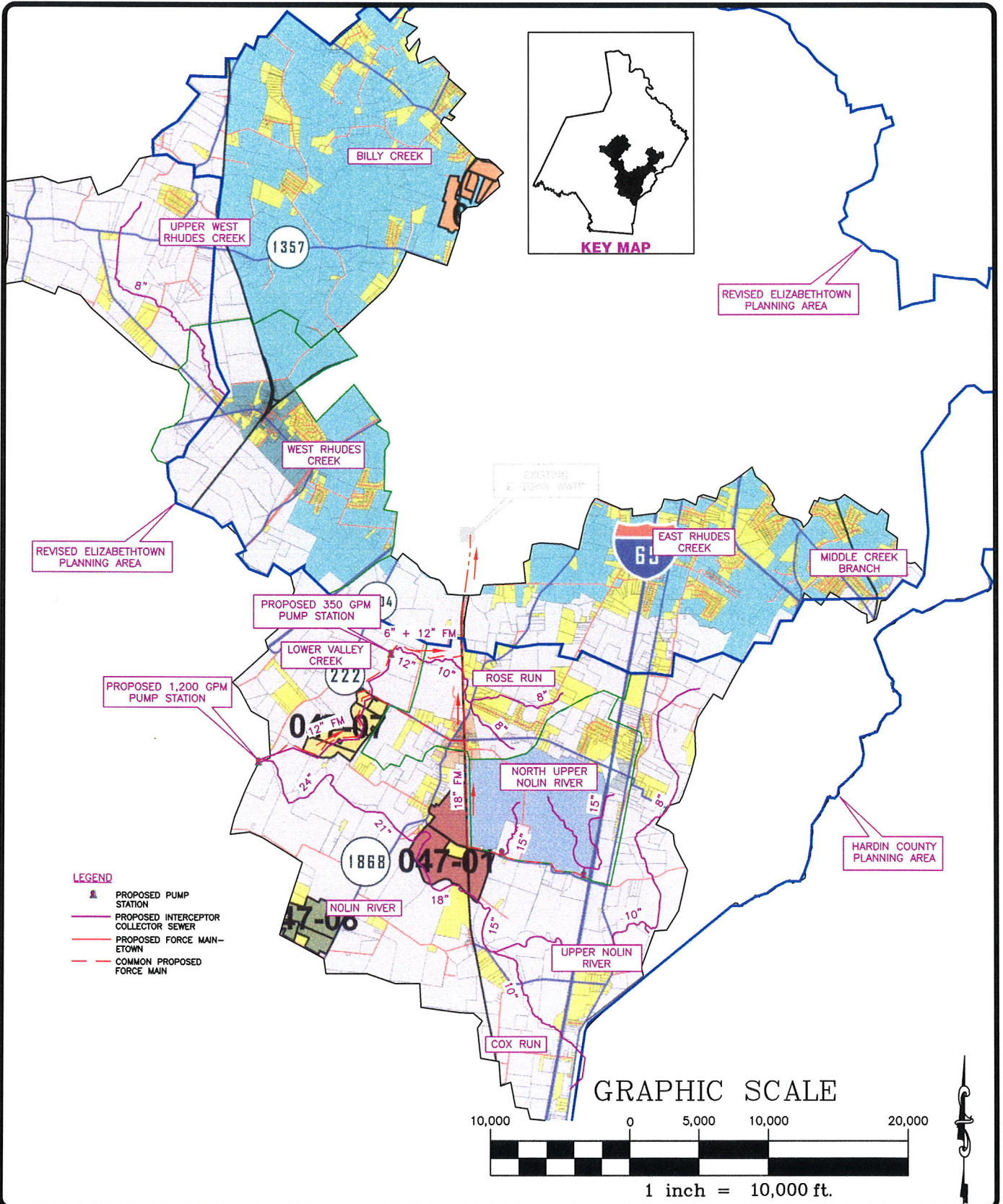
**DESIGN YEAR 2017 - SOUTHERN SERVICE AREAS
RECOMMENDED PLAN**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 8.01-2
JOB NO. 5-980-001

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**DESIGN YEAR 2027 - SOUTHERN SERVICE AREAS
RECOMMENDED PLAN**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 8.01-6
JOB NO. 5-980-001

Table 8.01-3 illustrates the recommended plan for each subwatershed and the capital cost opinion to develop that alternative. Figure 8.01-3 and Figure 8.01-7 illustrates collection, pumping, and routing for the Recommended Plan for the 2017 and 2027 Eastern Service Areas.

D. Upton and Sonora Service Area

The Upton and Sonora Service Area, which includes the Dorsey Run and Sandy Creek subwatersheds, was evaluated to be served by the Elizabethtown WWTP, Caveland WWTP, or a new Nolin River WWTP. The Dorsey Run and Sandy Creek subwatersheds were assumed to reach the maximum projected population during the 0- to 10-year planning horizon. Table 8.01-4 illustrates the recommended alternative for the subwatersheds and the capital cost opinion to develop that alternative.

Conveying wastewater to the Bonnieville pump station then to the Caveland WWTP is the most cost effective and is the recommended alternative for the Dorsey Run and Sandy Creek watersheds. Figure 8.01-4 illustrates collection, pumping, and routing for the Recommended Plan for the 2017 and 2027 Upton and Sonora Service Areas.

E. Rural Watersheds

The rural watersheds will be served by continued use of on-site treatment/disposal systems. In the event any subdivisions are planned, the developer will be expected to construct a cluster-type collection and treatment system for long-term management, operation and maintenance by HCWD1 or HCWD2. The cost of the construction will be borne by the developer and the OM&R costs will be funded by user rates.

8.02 SUMMARY

The Recommended Plan includes an ambitious effort to provide reliable wastewater service to many densely populated and unsewered areas of the county. The completion of these projects will take many years and require substantial funding. In total, the capital costs total over \$76 million for the recommended plan. See Table 8.02-1 for a breakdown of capital costs.

Service Area	Capital Cost by Year 2017 ⁽¹⁾	Capital Cost by Year 2027 ⁽¹⁾	Total
Northern	\$19,290,000	\$10,030,000	\$29,320,000
Southern	\$18,489,000	\$10,715,000	\$30,059,000
Eastern	\$5,281,000	\$5,775,000	\$11,056,000
Upton and Sonora	\$6,204,000	N/A	\$6,204,000
Rural	\$0	\$0	\$0
TOTAL	\$49,264,000	\$26,520,000	\$75,784,000

⁽¹⁾Does not include cost of collector services.

Table 8.02-1 Service Area Capital Costs

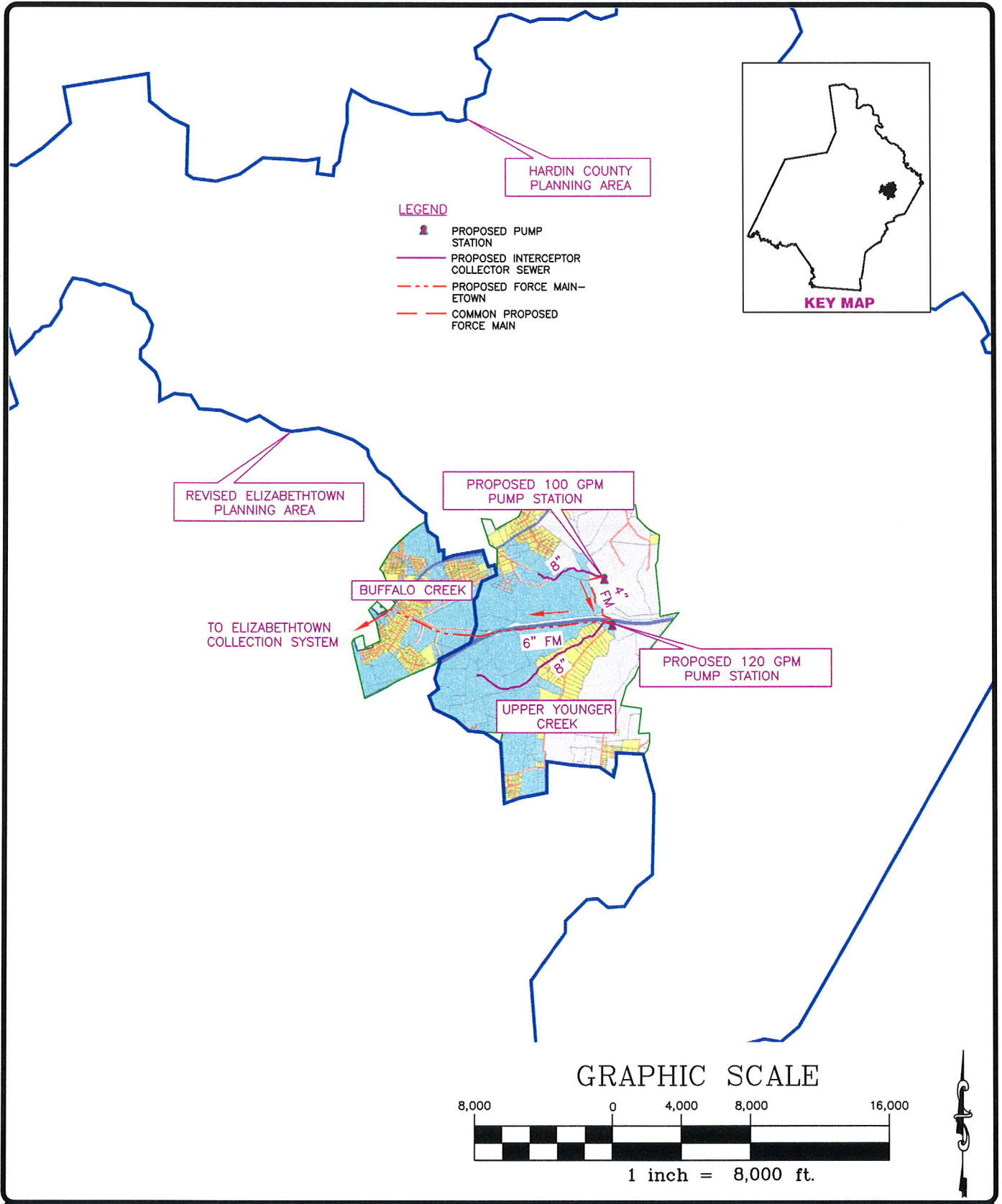
TABLE 8.01-3

EASTERN SERVICE AREA RECOMMENDED PLAN

SubWatershed	Area of Concern	Wastewater Flow (mgd)			Recommended Plan	Capital Cost Opinion ⁽¹⁾ (0 to 10 Year)	Capital Cost Opinion ⁽¹⁾ (10 to 20 Year)
		2003	2017	2027			
Upper Younger Creek	Springfield Road Area	0.08	0.12	0.16	In the 0-10 year planning horizon, collect wastewater through 8-inch trunk sewer to a 100 gpm and 120 gpm pump station. Construct a 4 and 6-inch force main and pump to the Elizabethtown collection system for treatment at the Elizabethtown WWTP. In the 10-20 year planning horizon, utilize existing 8-inch and construct additional 8 and 10-inch trunk sewers; abandon existing 100 and 120 gpm pump stations and flow by gravity to a new 400 gpm pump station. Utilize existing 6-inch force main into the Elizabethtown collection system for treatment at the Elizabethtown WWTP.	\$5,281,000	\$1,034,000
Cedar Creek		0.04	0.04	0.05	Collect wastewater through 8-inch trunk sewer to a regional 140 gpm pump station with 6-inch force main and pump to Elizabethtown collection system for treatment at the Elizabethtown WWTP	N/A	\$1,545,000
Clear Creek		0.10	0.13	0.17	Collect wastewater through 8-inch trunk sewer, to regional 430 gpm pump station with 8-inch force main and pump to Elizabethtown collection system for treatment at the Elizabethtown WWTP	N/A	\$3,196,000
Total		0.22	0.29	0.38		\$5,281,000	\$5,775,000

⁽¹⁾Does not include cost of collector sewers.

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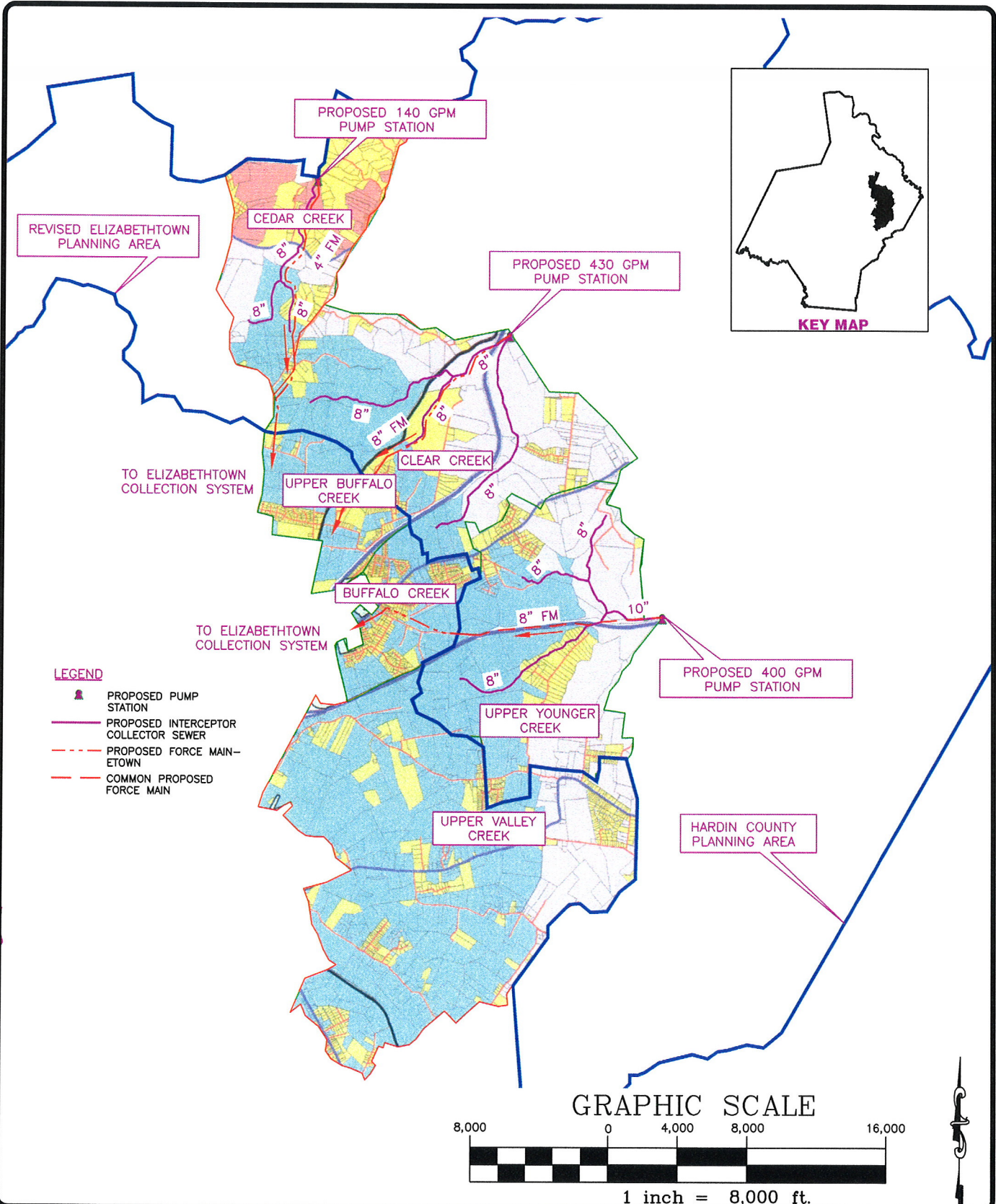
**DESIGN YEAR 2017 - EASTERN SERVICE AREAS
RECOMMENDED PLAN**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 8.01-3
JOB NO. 5-980-001

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**DESIGN YEAR 2027 - EASTERN SERVICE AREAS
RECOMMENDED PLAN**

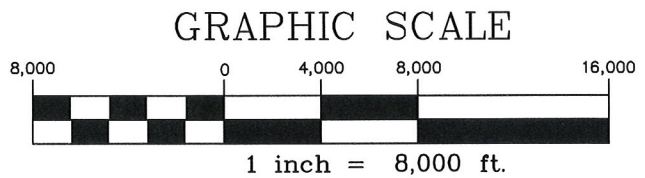
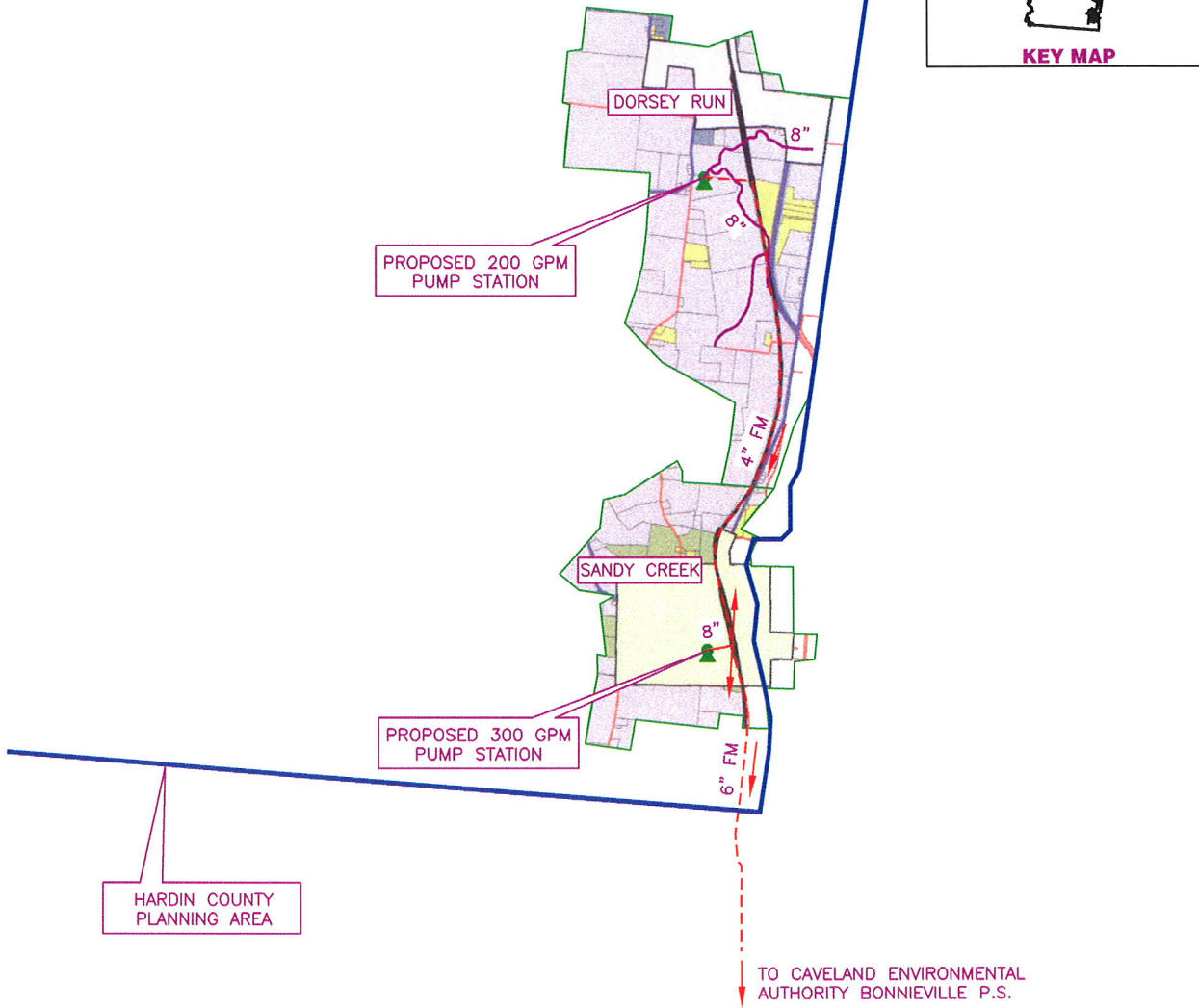
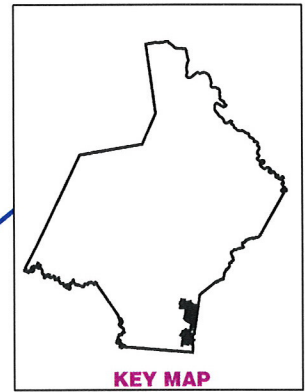
**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 8.01-7
JOB NO. 5-980-001

LEGEND

-  PROPOSED PUMP STATION
-  PROPOSED INTERCEPTOR COLLECTOR SEWER
-  PROPOSED FORCE MAIN-CAVELAND
-  COMMON PROPOSED FORCE MAIN



**DESIGN YEAR 2017 AND 2027 - UPTON AND SONORA SERVICE AREAS
RECOMMENDED PLAN**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



FIGURE 8.01-4
JOB NO. 5-980-001

TABLE 8.01-4

UPTON AND SONORA SERVICE AREA RECOMMENDED PLAN

SubWatershed	Area of Concern	Wastewater Flow (mgd)			Recommended Plan	Capital Cost Opinion ⁽¹⁾ (0 to 10 Year)	Capital Cost Opinion ⁽¹⁾ (10 to 20 Year)
		2003	2017	2027			
Dorsey Run and Sandy Creek	Upton and Sonora	0.08	0.09	0.09	Collect wastewater through 8-inch trunk sewer to regional 200 and 300 gpm pump stations with 4-inch and 6-inch force main and on to the Bonnieville Intermediate Pump Station for treatment at the Caveland WWTP.	\$6,204,000	N/A
Total		0.08	0.09	0.09		\$6,204,000	\$0

⁽¹⁾Does not include cost of collector sewers.

8.03 WORKING WITH MUNICIPAL TREATMENT PROVIDERS

HCWD2 has engaged the entities whom may provide treatment service for county wastewater (Elizabethtown, Radcliff, Fort Knox, and Caveland Environmental) in dialogue concerning the manner of working together in this endeavor. Each treatment plant either has adequate capacity or is in the process of being expanded. Table 8.03-1 lists the treatment needs for the existing facilities. This plan can provide insight to those cities expanding their plants. The previously mentioned entities have welcomed the concept of providing wholesale treatment of county wastewater under certain terms and conditions spelled out in letters included in Appendix E. The terms and conditions of the working relationship between HCWD2, HCWD1, and the treatment entities, including rates, should be documented in an Interlocal Agreement.

Municipal Facility	Current Capacity (mgd)	Current Average Flow (mgd)	2017 County Wastewater Flow (mgd)	2027 County Wastewater Flow (mgd)	Comment
Elizabethtown	7.20	6.20	2.90	3.60	Expansion under design
Radcliff	4.00	2.30	0.00	0.00	Adequate Capacity
Fort Knox	6.00	2.00	0.80	1.50	Adequate Capacity
Caveland Environmental	0.28	0.15	0.10	0.10	Adequate Capacity

Table 8.03-1 Treatment Needs for Existing Facilities

8.04 FUNDING SOURCES

Funding for the proposed sewer collection and conveyance system can be through many sources. Anticipated funding sources at this time include the following:

- Community Development Grant (CDBG)
- Kentucky Infrastructure Authority Grant (KIA)
- Economic Development Administration Grant (EDA)
- Rural Development (RD)-50% Grant/50% Loan-(May be eligible for 60/40 or 75/25 Loan.)
- State Revolving Fund Loan
- User Tap Fees (System Development Charges for Conveyance and Treatment)
- User Assessments (for collector sewers)
- Cash on Hand
- Direct Grants
- Developers/Recapture Agreements

HCWD2 should work closely with developers to help pay for or offset some of the capital costs for conveyance infrastructure. Many regional sewerage agencies were able to fund portions of their infrastructure in this manner.

As previously mentioned, the regional nature of the proposed projects and the environmental benefit that will result make the projects very attractive for grant funding. HCWD2 should prepare project profiles and regularly discuss these projects with funding agencies and elected officials to maximize the funding with grants.

8.05 USER CHARGE EVALUATION

HCWD2 does not have any sewer customers at this time and thus does not have any current rates. The potential user charge rates for an assumed area were computed based on several assumptions. An official rate study should be prepared to establish fair and equitable rates once the project is near completion. The following assumptions were made in this cursory evaluation:

- Existing customers would pay an assessment for the construction of collector sewers. The amount of the assessment is dependent on the cost to install sewers and the number of customers. Where other agencies have used this approach, assessments ranged from \$8,000 to \$12,000.
- HCWD2 would use grant monies (\$1,000,000) and an additional 25 percent grant/75 percent loan package from Rural Development to provide funding for the \$5,866,000 project.
- The entire life of the loan would be over 40 years.
- The anticipated interest rate for the 75 percent loan is expected to be approximately 4.5 percent.
- The estimated annual debt service payment is approximately \$198,000 per year.
- Rates would collect 5 percent additional revenue for debt service coverage.
- A replacement fund account would be funded at \$5,000 per year.
- An operational budget would include the following:
 - \$10,000 in administrative expense
 - \$25,000 for part-time employees
 - \$10,000 for electric and chemicals
 - \$10,000 for emergency expenses (clogs, etc.)
 - \$5,000 for billing expense
- The Brushy Fork Creek watershed generates 223,000 gpd of wastewater (assumes nominal I/I).
- HCWD2 pays Fort Knox rates of \$2 per 1,000 gallons.
- Each customer discharges 4,000 gallons per month of wastewater.

- Customers would be billed based on their metered water usage.

Based upon the above assumptions, a customer discharging 4,000 gallons per month would be charged about \$41 per month to become an annual total of \$489 per year. These costs do not include the installation of collector sewers (assessment).

If the initial construction was limited to just the more densely-populated Burns-Deckard School Road area, the monthly rates using similar assumptions as above would be about \$38 per month or \$450 per year. These costs do not include the installation of collector sewers (assessment).

Any additional grants or customers above the existing number of homes will help to reduce these future costs.

A more extensive rate evaluation study will need to be completed at the time of the project. Public Service Commission approval would be required.

HCWD2 will have to evaluate rates for each specific service area and determine the equitability of charging rates that vary by area or rates that are universal. Public Service Commission approval would be required.

Rate determinations for other service areas are too dependent on actual project costs and funding scenarios to be predicted in this report. There is risk in under and over projecting potential rates.

8.06 IMPLEMENTATION PLAN

A. General

Because of the number of regulatory and funding agencies that will be involved in the development of county wastewater conveyance and treatment, and the length of time required for each, implementation of the recommended plan should begin upon plan approval to eliminate failing on-site wastewater treatment systems and protect the environment and the public health for the residents of Hardin County. Projects within the 0- to 10-year time frame can be prioritized based on need, citizen interest, development interest, and funding availability.

B. Action Plan

Hardin County Water District No. 2 should initiate the following actions:

1. Review, approve, and adopt this Facilities Plan report. Resolutions will be required by HCFC (adopting the planning area), HCWD2 (adopting the plan), HCWD1 (adopting the plan), and City of Elizabethtown (adopting their revised planning area).
2. Conduct a public hearing to discuss the Facilities Plan Report and Recommended Plan.

3. Submit the adopted Facilities Plan to the Kentucky Environmental and Public Protection Cabinet–Division of Water for review, comment, and approval.
4. Initiate the procurement process for engineering services necessary for the design, bidding, and construction of the facilities described in the Recommended Plan according to the requirements of the anticipated funding sources.
5. Gauge public interest, development pressure, public health, environmental impact, and availability of funding to prioritize 0- to 10-year projects.
6. Pursue sources of grant monies for the proposed projects.
7. Study and implement a customer System Development Charge to begin equitably charging new customers for their share of the proposed infrastructure.
8. Study and implement a customer rate to help offset the cost for continued improvement to your system. PSC approval is likely required.
9. Procure the sites to build new pump stations and acquire easements for gravity sewer and force mains as soon as it is feasible.
10. Negotiate equitable Interlocal Agreements with those treatment entities included in the Recommended Plan (Elizabethtown, Caveland Environmental, Radcliff, and Fort Knox).

**SECTION 9
PUBLIC PARTICIPATION**

9.01 INTRODUCTION AND BACKGROUND

KDOW requires a public participation process as part of the review/approval of a RWWFP. HCWD2 has accomplished the following efforts:

1. Assembled an Advisory Committee and conducted 12 meetings of the Advisory Committee throughout the plan development. The Advisory Committee is made up of representatives from HCWD2, HCWD1, County Judge-Executive, County Planning and Development, County Engineer, County Environmental Service, City of Elizabethtown, City of Radcliff, City of Vine Grove, and Fort Knox. Meeting materials and minutes have been posted to the HCWD2 website so they may be made available to the public.
2. Delivered a presentation to the Hardin County Planning Commission Public Hearing introducing the plan and presenting findings to date. A meeting was held on November 22, 2005. A copy of the presentation made at the meeting is included in Appendix C.
3. Made periodic presentations to the HCWD2 board at monthly meetings that are open to the public.
4. Published an article in The News-Enterprise on November 27, 2005 introducing the plan to the public. A second article was published in The News-Enterprise on October 30, 2007 summarizing the results of the study. A copy of each of these articles is included in Appendix I.
5. Conducted a Public Hearing of the Draft Regional Wastewater Facilities Plan on October 25, 2007 at 6:30 P.M. at the H. B. Fife Courthouse on the square in Elizabethtown, KY. A copy of the Public Notice is included in Appendix B. The public comment period ran for 30 days from the date of first publication on October 11, 2007 to November 12, 2007. Meeting minutes of the public hearing is included in Appendix A.

9.02 CLEARINGHOUSE LETTERS

Letters describing the proposed 0- to 10-year projects were sent to the Kentucky Heritage Council, Kentucky Fish and Wildlife Service, and U.S. Fish and Wildlife Service for review on November 9, 2007. A copy of these letters are included in Appendix J.

**APPENDIX A
PUBLIC HEARING MEETING MINUTES**

PUBLIC HEARING MEETING MINUTES
HARDIN COUNTY REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
OCTOBER 25 2007, 6:30 P.M.

MEETING DATE: October 25, 2007

LOCATION: Hardin County Fiscal Courthouse

PURPOSE: Public Hearing to present the results of the Hardin County Regional Wastewater Facilities Plan

ATTENDEES: See attached list

Discussion Items

Question and Answer

Q (Public): If Radcliff gave the responsibility of operating and maintaining their municipal wastewater collection system to Hardin County Water District No. 1, could that decrease project costs to the county to hook into the system?

A (Strand): County wastewater would need to be conveyed directly to the Radcliff wastewater treatment plant due to the large number of pump stations in the collection system.

Q (Public): Radcliff has constructed and is constructing new gravity sewers that could help convey county wastewater. Would this potentially help decrease costs?

A (Strand): The 20-year present worth analysis indicates that conveying wastewater to Ft. Knox is probably a better solution due to the large amount of reserve capacity at the wastewater treatment plant. An evaluation should be made prior to any construction project to make sure the recommended plan is still the most cost-effective.

Q (Public): The Ft. Knox Base Realignment and Closure will cause an additional 8,000 to 9,000 people generating wastewater by 2010. Will this create capacity problems at the Ft. Knox wastewater treatment plant?

A (Strand): Fort Knox should still have adequate capacity based on current usage.

Q (Public): Were the prices reflected in the presentation in today's dollars or in projected dollars?

A (Strand): Prices reflected in the presentation were given in today's dollars. Future prices are highly variable on material and labor costs and one could probably plan for about 3 percent inflation per year.

PUBLIC INFORMATION MEETING MINUTES
HARDIN COUNTY REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
OCTOBER 25, 2007 6:30 P.M.
Page 2

Q (Public): How will the rate structure be addressed?

A (Strand): The rate structure will need to be addressed by the Public Service Commission.

Q (Public): Radcliff has been working aggressively on an Infiltration and Inflow reduction plan to reduce flow to the wastewater treatment plant. Could this allow the Radcliff wastewater treatment plant to potentially accept county wastewater?

A (Strand): That is a possibility.

Comments

Comment (Strand): The Regional Wastewater Facilities Plan is a dynamic plan and is written so that changes can be made and on a watershed-by-watershed basis; this can be done through amendments to the plan.

Comment (Strand): The longer the wait is to start implementing the projects in the plan, the more expensive it will become.

If there are any additions and/or comments, please contact me at 502-583-7020.

Sincerely,

STRAND ASSOCIATES, INC.



Mark Sneve, P.E.



**APPENDIX B
PUBLIC HEARING NOTICE**

*For publication in
The News-Enterprise
10/11/07 to 10/18/07*

Notice of Public Hearing

(Pursuant to 401 KAR 5:006 Sections 4 & 5, KRS 24 and 40 CFR 25.5 & 6)

Interested citizens of Hardin County are invited to a public hearing sponsored by the Hardin County Water District No. 2. The meeting will start at 6:30 p.m. on Thursday, October 25, 2007 in the H.B. Fife Courthouse, 100 Public Square 3rd Floor, Elizabethtown, KY. An open house will be held at 6:00 p.m.

The Hardin County Water District No. 2, under the authority of the Hardin County Fiscal Court, has prepared a 20-year Regional Wastewater Facilities Plan for areas of Hardin county without municipal wastewater service. The planning area is all of Hardin County with the exception of Fort Knox, the existing planning areas of West Point, Radcliff, Vine Grove and the revised planning area of Elizabethtown. The recommended plan represents the alternatives with the lowest present worth cost, a minimal environmental impact, and the highest capability for implementation. The recommended plan calls for wastewater to be collected from the high growth areas and areas of greatest public health and environmental need within the planning area and conveyed to various municipal facilities for treatment. The draft plan is available for review by any citizen at the Hardin County Water District No. 2 office, 360 Ring Road, Elizabethtown during normal business hours until November 12.

The purpose of the public hearing is to discuss the draft plan and its contents, specifically the alternatives, estimates of project cost, financing sources, user charges, etc. Verbal and written comments will be entertained at the public hearing. Written comments concerning the plan will also be accepted until November 12, 2007. Written comments should be addressed to Hardin County Water District No. 2, 360 Ring Road, Elizabethtown, KY 42701.

APPENDIX C
PUBLIC HEARING PRESENTATIONS

Regional Wastewater Facilities Plan

Hardin County Water District No. 2



Public Hearing
October 25, 2007



Agenda

- Introductions
- Public Involvement
- Overview
- Planning Areas
- Areas of need
- Municipal Systems
- Recommended Plan
- Rate Impacts
- Implementation
- Public Comment



Public Comment Period

Plan is available for review:
Hardin County Water District No. 2 Office

Public Comments will be accepted at Public Hearing
(please sign in)

Written Comments will be accepted until November 12
Hardin County Water District No. 2
360 Ring Road
Elizabethtown KY 42701



What is a Regional Wastewater Facilities Plan (RFP)?

- Comprehensive
- Wastewater Collection and Treatment
- Local Solution
- Defined Planning Area
- Defined period of time
- Universal Goal = Protect Environment and Human Health by Providing Reliable Wastewater Disposal

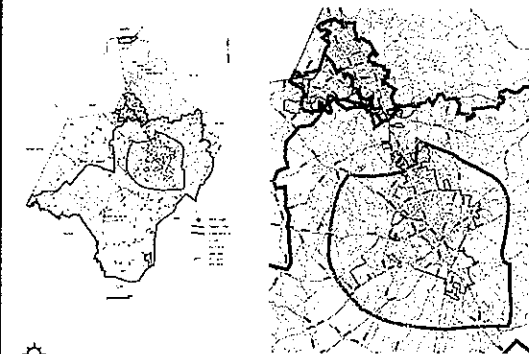


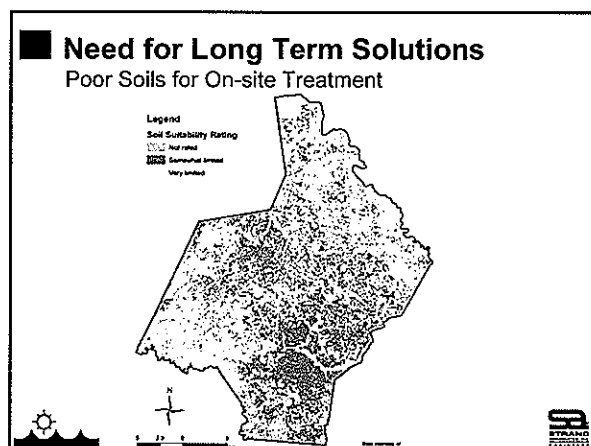
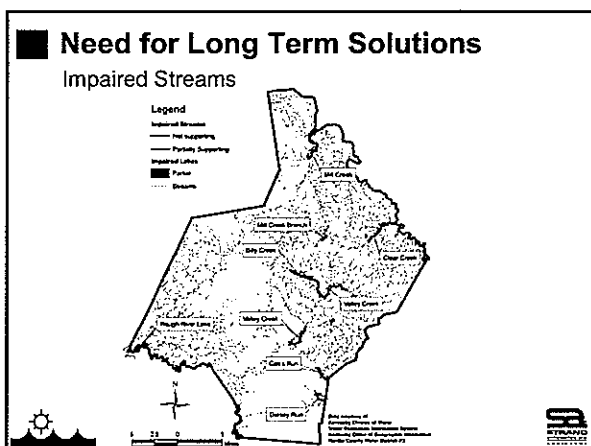
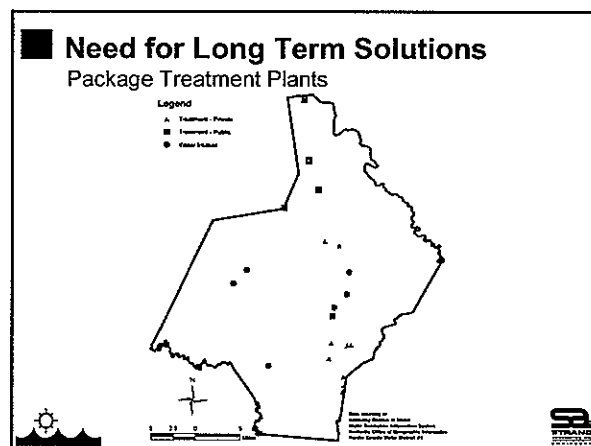
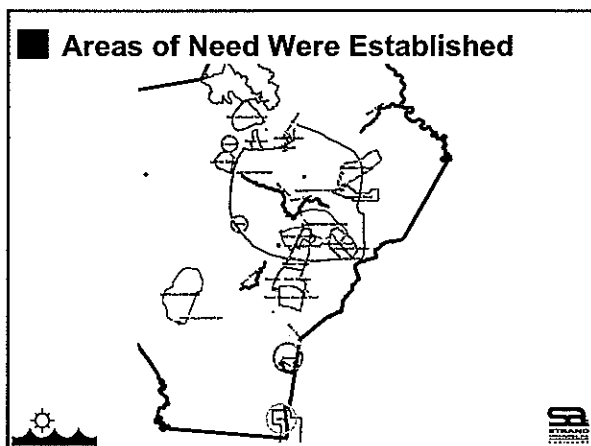
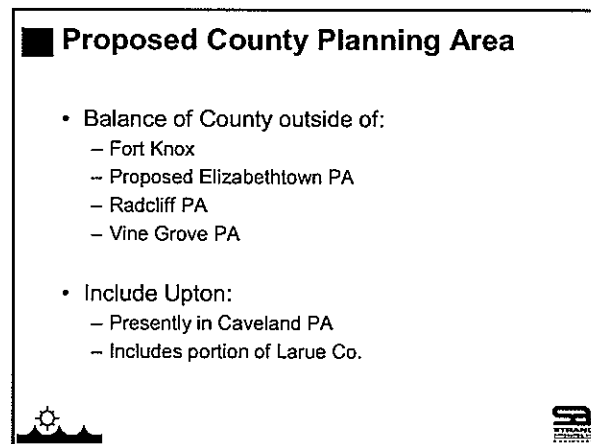
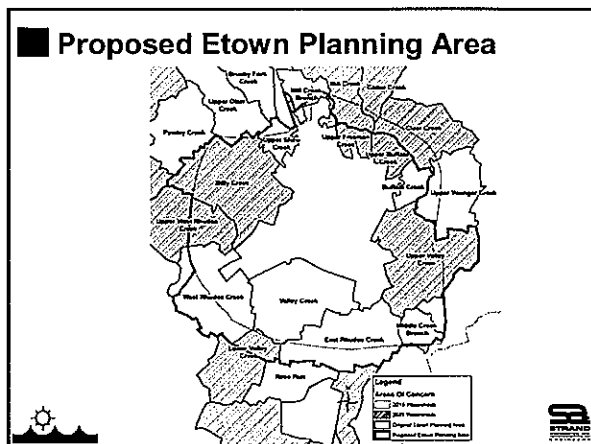
Objectives

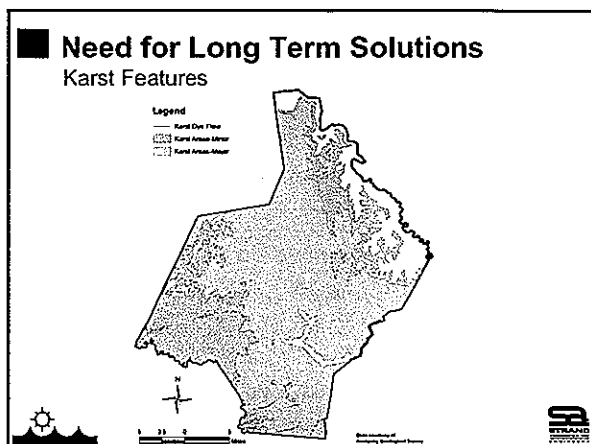
1. Develop a cost-effective, environmentally-sound solution for wastewater disposal.
2. Explore regional solutions.
3. Provide flexibility to serve existing and future needs.
4. Involve citizens and stakeholders in the process.
5. Gain state approval.
6. Obtain grants and low-interest loans to minimize financial impact on County customers.



Existing Planning Areas







- ### Need for Long Term Solutions
- #### Failing On-site Systems
- Bardstown Road Area
 - LaVista Estates
 - Rineyville
 - Boone Road
 - Burns-Deckard School Road Area
 - Smithersville
 - Glendale and Areas North
 - New Glendale Road
 - Thoroughbred Estates/Thousand Oaks
- STRAND CONSULTANTS

Permitted WWTPs

WWTP Name	Type	Rated Capacity (mgd)	Average Flow (4/02 - 3/03) (mgd)	Percent of Capacity
Elizabethtown	Municipal	7.2	6.18	86
Radcliff	Municipal	4.0	2.34	59
Vine Grove	Municipal	0.714	0.30	41
West Point	Municipal	0.20	0.11	53
Ft. Knox	Government	6.0	2.0	33

11 Small Package WWTPs

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Future Needs

- Growth Projected at 2X KSDC
- 2027 Flow by Region

Service Region	2017 Need	2027 Need
North & Northwest	1.2 mgd	1.9 mgd
East	0.3 mgd	0.4 mgd
South & Southwest (1)	2.5 mgd	2.9 mgd

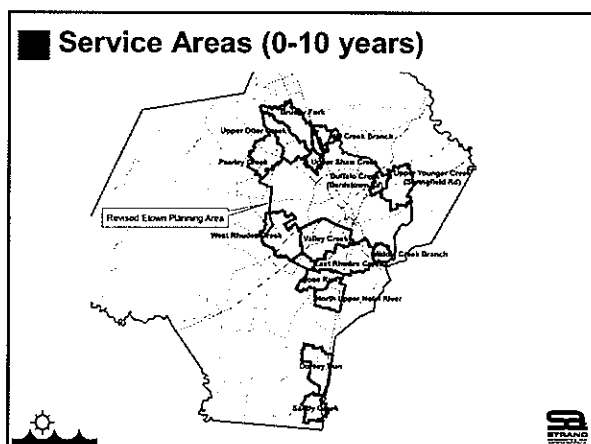
(1) Includes Upton & Sonora and 2 mgd for industrial tract

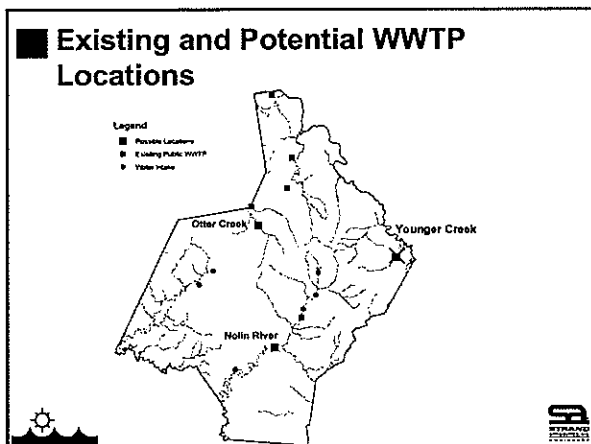
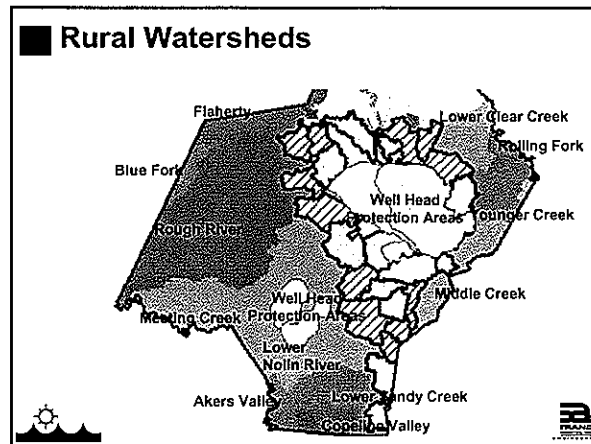
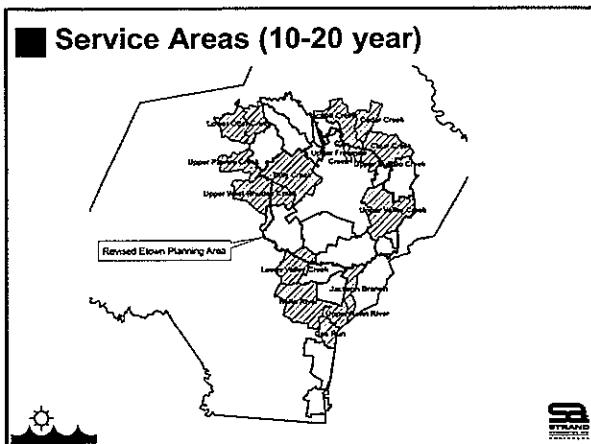
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Information Requests From Utilities

Utility	Terminal FM Location	Costs to County	Special Conditions	Volume Charge /1000 gal
FL Knox	Wilson Road gate or Bullion Blvd Gate	Share in cost to upsize lines	Subject to PSC approval	\$2.00
Radcliff	WWTP	New WWTP Headworks	Capacity charge \$1000/cust.	\$4.10
Vine Grove	WWTP	Build WWTP Capacity		\$5.00
E-town	Varies by area		Capacity Charge \$1500/Cust. for Convey & \$500/Cust. for WWTP	\$3.35 (soon)
Caveland	Bonnieville PS	Provide Equalization		\$4.54

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- ### Alternatives Defined
- Watershed - by - Watershed
 - Work with various existing utilities
 - County treatment solution

- ### Alternatives Evaluation
- Capital Costs (up front investment)
 - Present Worth Costs (20 year total costs)
 - Non-economic Factors

Typical Non-economic Evaluation



Factor	Alternative		
	Pump to Etowah WWTP	Pump to Otter Creek WWTP	Pump to Radcliff WWTP
Ability to Construct	1	0	0
Ability to Expand	0	0	0
Ability to Upgrade for Future Flow	1	0	0
Operation and Maintenance	0	-1	-1
Anticipated Public Acceptance	1	0	0
Regional Solution	1	0	1
Reliability	1	-1	-1
Odor Potential	1	-1	-1
Impact to Land	1	-1	-1
Impact on Future Development	0	0	0
Total	7	-4	-3

Most Favorable

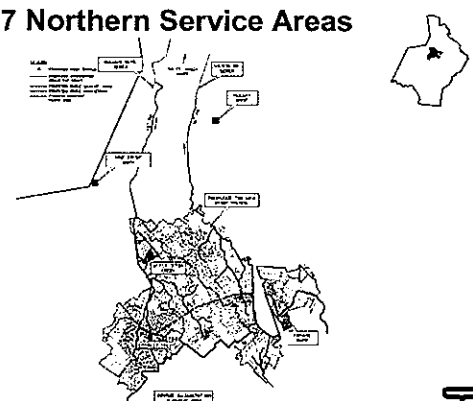


Recommended Plan

Discussed by Service Area
Considered in Making Recommendations:

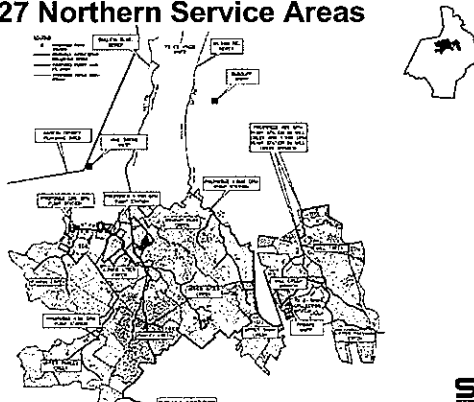


1. Capital Cost
2. Present Worth Cost
3. Non-Monetary Factors

2017 Northern Service Areas

2027 Northern Service Areas

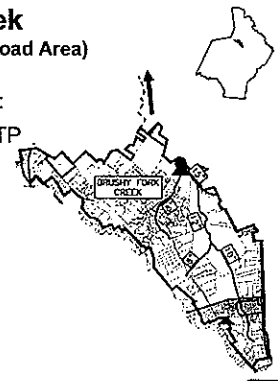






Brushy Fork Creek (Burns-Deckard School Road Area)

Recommended Alternative:
Pump to Fort Knox WWTP

Costs:
by 2017 - \$5,866,000
by 2027 - \$117,000

Schedule:
Initiate before year 10

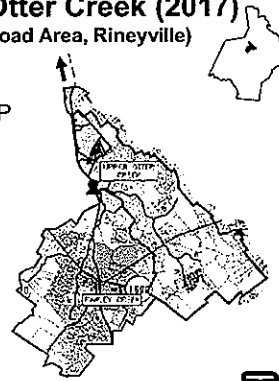






Pawley & Upper Otter Creek (2017) (LaVista Estates, Boone Road Area, Rineyville)

Recommended Alternative:
Pump to Fort Knox WWTP

Costs:
by 2017 - \$8,204,000
by 2027 - \$5,916,000

Schedule:
Initiate before year 10

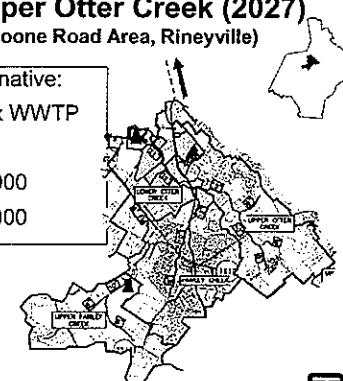






Pawley & Upper Otter Creek (2027) (LaVista Estates, Boone Road Area, Rineyville)

Recommended Alternative:
Pump to Fort Knox WWTP

Costs:
by 2017 - \$8,204,000
by 2027 - \$5,916,000

Schedule:
Between Year
10 & 20

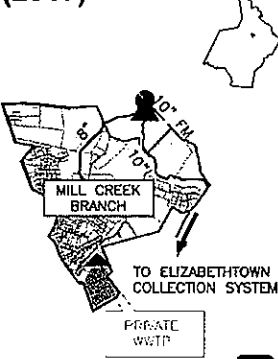




Mill Creek Branch (2017)
(Airview Estates)


Recommended Alternative:
Pump to ETown WWTP

Costs:
by 2017 - \$5,220,000
by 2027 - \$855,000

Schedule:
By Year 10



TO ELIZABETHTOWN COLLECTION SYSTEM
PRIVATE WWTP

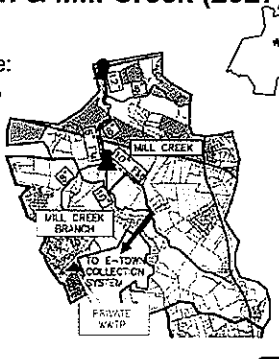


Mill Creek Branch & Mill Creek (2027)
(Airview Estates)


Recommended Alternative:
Pump to ETown WWTP

Costs:
by 2017 - \$0
by 2027 - \$1,838,000

Schedule:
Between Year 10 & 20



TO ELIZABETHTOWN COLLECTION SYSTEM
PRIVATE KKTP

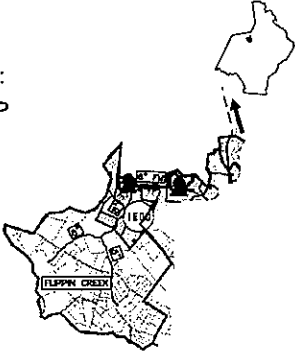



Flippin Creek

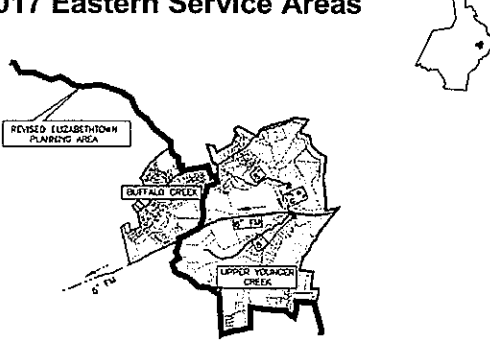
Recommended Alternative:
Pump to Ft. Knox WWTP

Costs:
by 2017 - \$0
by 2027 - \$1,304,000


Schedule:
Between Year 10 & 20

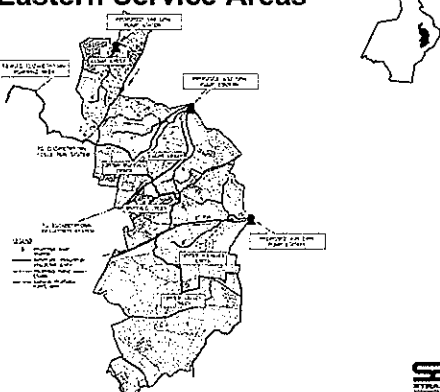

2017 Eastern Service Areas



REVISED ELIZABETHTOWN PLANNING AREA
BUFFALO CREEK
UPPER YOUNGER CREEK



2027 Eastern Service Areas





Upper Younger Creek
(Springfield Road Area)


Recommended Alternative:
Pump to ETown WWTP

Costs:
by 2017 - \$5,281,000
by 2027 - \$1,034,000

Schedule:
By Year 10



REVISED ELIZABETHTOWN PLANNING AREA
UPPER YOUNGER CREEK

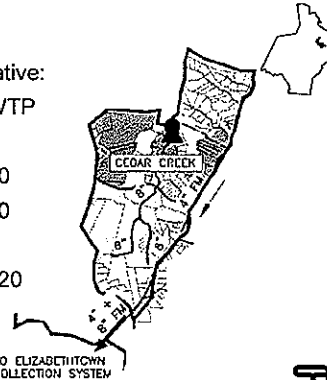


■ Cedar Creek


Recommended Alternative:
Pump to ETown WWTP

Costs:
by 2017 - \$0
by 2027 - \$1,545,000

Schedule:
Between Year 10 & 20



TO ELIZABHTOWN COLLECTION SYSTEM

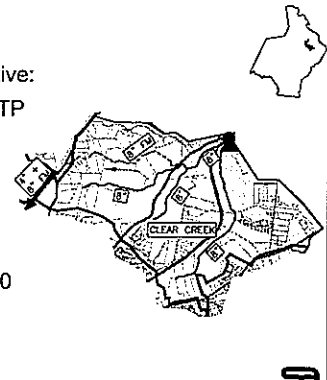



■ Clear Creek

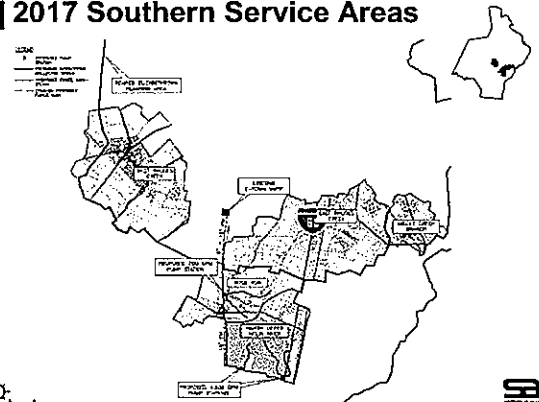

Recommended Alternative:
Pump to ETown WWTP

Costs:
by 2017 - \$0
by 2027 - \$3,196,000

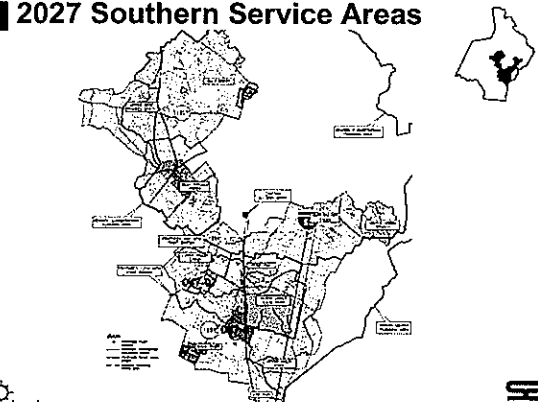

Schedule:
Between Year 10 & 20

■ 2017 Southern Service Areas

■ 2027 Southern Service Areas

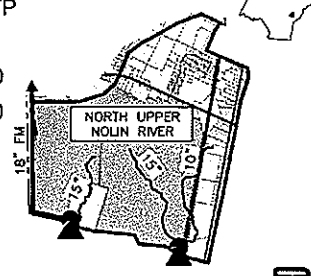




■ North Upper Nolin River (Gilead Church-Glendale Rd, Glendale Industrial Tract)

Recommended Alternative:
Pump to ETown WWTP

Costs:
by 2017 - \$16,043,000
by 2027 - \$855,000

Schedule:
By Year 10

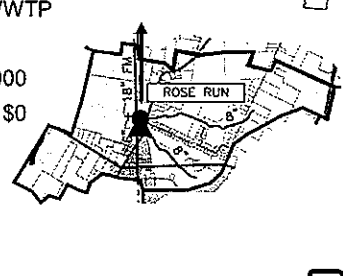




■ Rose Run (Glendale)

Recommended Alternative:
Pump to ETown WWTP

Costs:
by 2017 - \$2,446,000
by 2027 - \$0

Schedule:
By Year 10

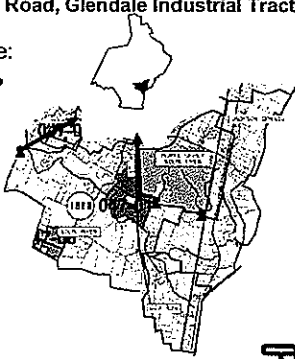





Nolin River, Cox Run, and Jackson Branch
(Gilead Church-Glendale Road, Glendale Industrial Tract)

Recommended Alternative:
Pump to ETown WWTP

Costs:
by 2017 - \$0
by 2027 - \$7,102,000

Schedule:
Between Year 10 & 20

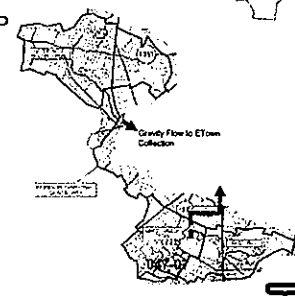






Lower Valley, Upper West Rhudes and Rose Run (2027) (Glendale)

Recommended Alternative:
Pump to ETown WWTP

Costs:
by 2017 - \$0
by 2027 - \$3,613,000

Schedule:
Between Year 10 & 20

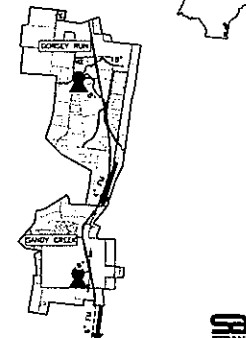


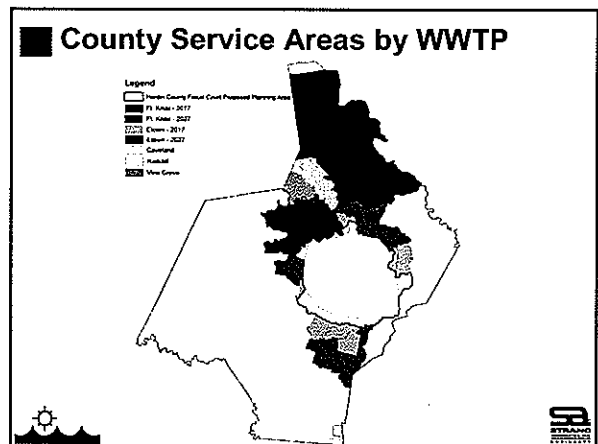




Dorsey Run and Sandy Creek
(Upton & Sonora)

Recommended Alternative:
Pump to Caveland WWTP

Costs:
by 2017 - \$6,204,000
by 2027 - \$0


Schedule:
By Year 10

County Wastewater Flow by WWTP

	Average Daily Flow (mgd)	
	By 2017	By 2027
Ft. Knox ⁽²⁾	0.8	1.5
Elizabethtown ⁽¹⁾	2.9	3.6
Cavland ⁽²⁾	0.1	0.1
TOTAL	3.8	5.2

(1) Under Expansion
(2) Adequate Capacity




Recommended Plan Summary

	Capital Cost (\$M)	
	By 2017	By 2027
Northern Area	\$19.3	\$10.0
Eastern Area	\$5.3	\$5.8
Southern Area	\$18.5	\$10.7
Upton & Sonora	\$6.2	\$0.0
TOTAL	\$49.3	\$26.5

Population served about 18,000 about 14,000

Total Cost \$75.8M for 32,000 Population served





■ Potential User Rates

Brushy Fork Area

Assumptions:
 Grant \$1M
 RD Grant (25%/Loan (75%)
 RD Loan 40 year, 4.5%
 Customer pays assessment for sewer installation



Rates fund:
 O&M,
 Replacement,
 Debt Service & coverage,
 Treatment cost (Ft. Knox)

Typical Customer @ 4000 gal/mo \$41/month

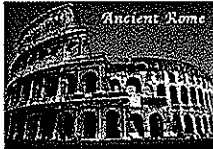



■ Completion

<u>Task</u>	<u>Schedule</u>
Public Hearing	Oct. 25
Public Comment Period Closes	Nov. 12
Submit Facilities Plan to KDOW	Nov. 15
Approval by KDOW	??






■ Implementation

Prioritize Projects
 Pursue Funding
 Design
 Construction








■ Public Comment

■ Implementation Steps

- Solicit Public Comment
- Obtain Approval for Plan from KDOW
- Finalize Interlocal Agreements with Municipalities
- Pursue Funding (grants, loans)
- Begin 0-10 year Projects
- Establish Rates Based on Project Cost and Sources of Funding
- Continue with Future Projects






■ Public Comment Period

Plan is available for review:
 Hardin County Water District No. 2 Office

Public Comments will be accepted at Public Hearing
 (please sign in)

Written Comments will be accepted until November 12
 Hardin County Water District No. 2
 360 Ring Road
 Elizabethtown KY 42701

Regional Wastewater Facilities Plan Update

Mark Sneve, P.E.
Project Manager

Hardin County Planning Commission
Comprehensive Plan Public Hearing No. 3
November 22, 2005



OUTLINE

- Overview of Facilities Planning
- Wastewater Treatment in Hardin County
- Areas of Need
- Proposed Service Areas
- Alternatives Refinement
- Questions and Answers

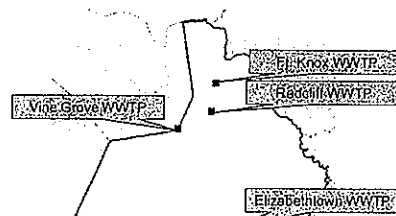


What is a Regional Wastewater Facilities Plan (RFP)?

- Comprehensive
- Wastewater Collection and Treatment
- Local Solution
- Defined Planning Area
- Defined period of time
- Universal Goal = Protect Environment and Human Health by Providing Reliable Wastewater Disposal



Hardin County Treatment Plants



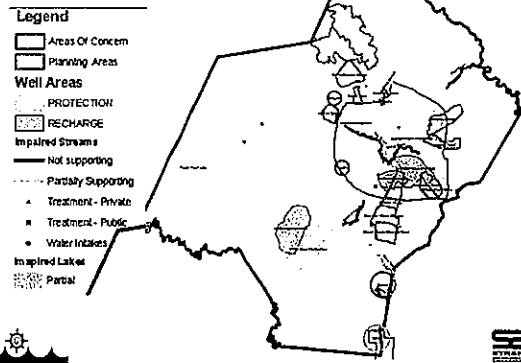
Permitted WWTPs

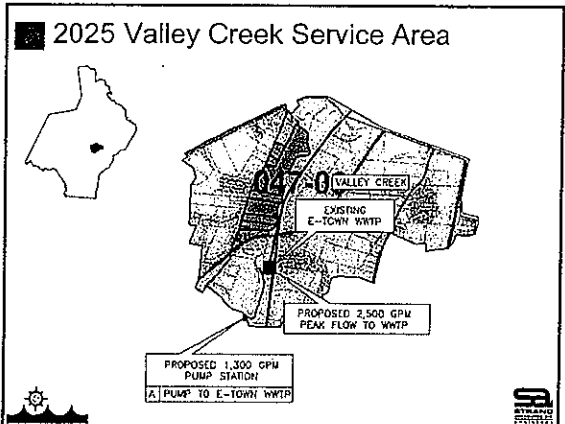
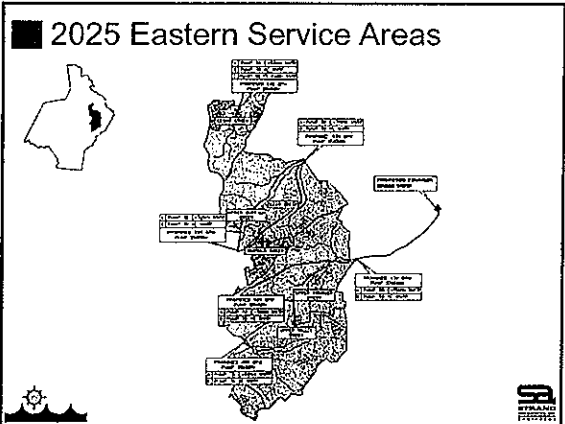
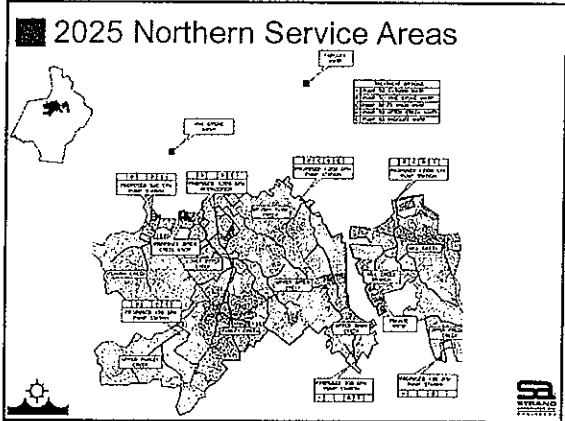
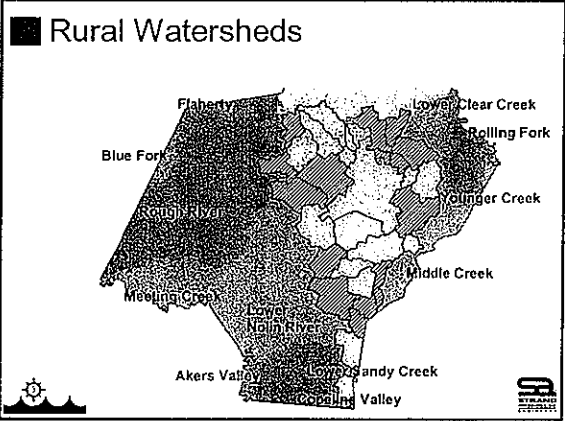
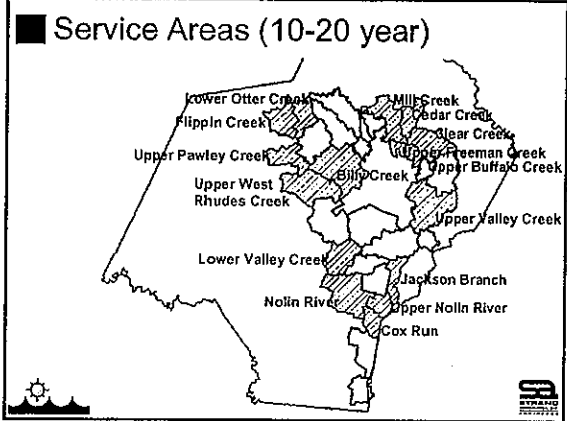
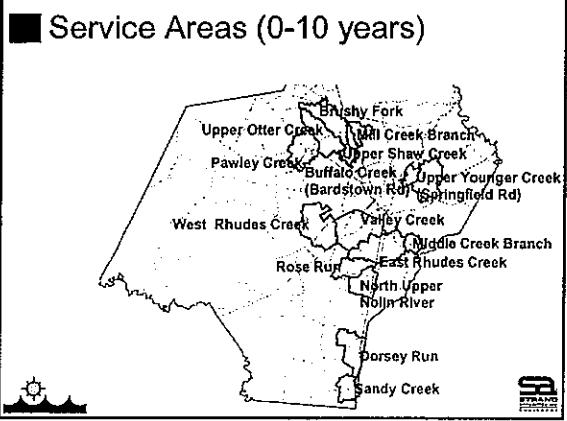
WWTP Name	Type	Rated Capacity (mgd)	Average Flow (4/02 - 3/03) (mgd)	Percent of Capacity
Elizabethtown	Municipal	7.2	6.18	86
Radcliff	Municipal	4.0	2.34	59
Vine Grove	Municipal	0.714	0.30	41
West Point	Municipal	0.20	0.11	53
FL Knox	Government	6.0	2.0	33

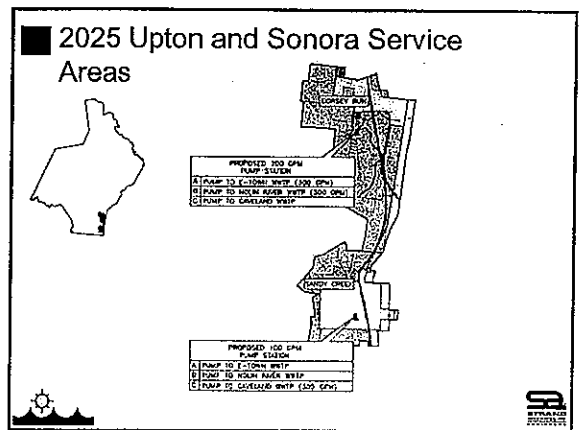
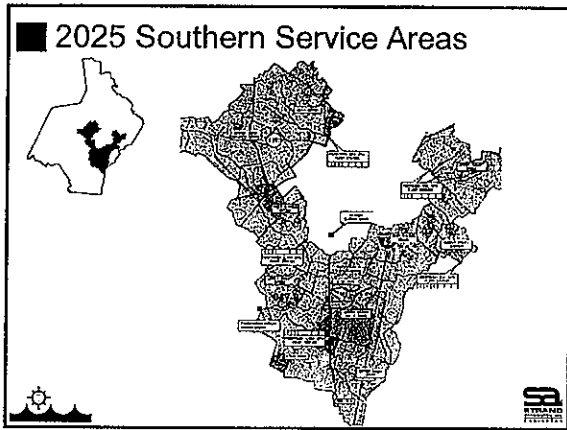
11 Small Package WWTPs



AREAS OF CONCERN







Regional Wastewater Facilities Plan Update

Questions & Answers

Follow our Progress at
www.hardincountywater2.org

APPENDIX D
REGIONAL FACILITIES PLAN PREPARATION CHECKLIST

REGIONAL FACILITIES PLAN PREPARATION CHECKLIST
 (Page Numbers should be entered and this document submitted with plan)

Name of Facility Hardin County Regional
Wastewater Facilities Plan

Date 10/10/07

Section

Page No.

I. Introduction

- A. Summary, Conclusions, and Recommendations
 (include detailed scope of the proposed project)

1-1

II. Project Background

- A. Planning Area (PA) Characteristics

1. Delineation of PA (on USGS 7 1/2 minute topo).
 You may use any mapping system you wish, but at least one USGS topo map must be submitted.

Fig. 2.03-1

The map of the PA must identify the following where applicable:

- a. The area proposed to be served in the next 20 years broken down into phases of 0-2 years, 3-10 years and 11-20 years. If this phasing just is not suitable, you may propose others.
- b. Existing treatment facilities, package plants, water intakes.
- c. Sludge disposal sites, if applicable.
- d. Existing interceptors, pumping stations and force mains.
- e. Proposed interceptors including pump stations and force mains for the entire planning area.

Fig. 3.03-1 &
3.03-2

Fig. 3.05-1

N/A

N/A

Figs 7.03-1
through 7.03-7

2. Land Use in PA - attach current land use map, if existing, with planning area shown on it. If none exist, just state that none exist.

None Exist

B. Existing Facilities

Describe the existing municipal sewage transport/treatment/disposal facilities including:

Section 4

1. The method of wastewater treatment and the physical condition (e.g., sizing or efficiency of components) of facilities, which should include years in service of major components. *Discuss how existing WWTP meets reliability standards and shortcomings if existing WWTP does not.* 4-4
2. The method of sludge handling and disposal. 4-4
3. The design capacity, existing flows, and characteristics of wastes. 4-4
4. An analysis of average peak, dry, and wet weather flows. N/A
5. Discuss infiltration/inflow including calculations of gallons per capita per day. Describe any known I/I problems including any SSES reports. Discuss ongoing program addressing I/I problems. For average gallons per capita per day, use the most recent twelve month average flows. For maximum gallons per capita per day, use the highest 24-hour flow recorded in the last twelve months. 4-10

6. The location of all bypasses and combined sewer overflows with their frequency, duration, and cause. 4-10
7. If there are any recurring bypasses due to wet weather, in the system, a Sanitary Sewer Overflow Plan (SSOP) must be included as part of the facility plan. The criteria for an SSOP can be obtained from the Municipal Planning Section of the Division of Water. 4-10
8. An evaluation of pump station capacities. N/A
9. A discussion of operation and maintenance including any problems. N/A

C. Need for the Project

The need for the proposed project should include a discussion of the following:

1. Compliance Status

N/A

Describe the status of compliance with the existing KPDES permit.

a. An identification of any unpermitted discharges.

b. A copy of the latest permit.

2. Orders

N/A

Describe any court or enforcement order against the community including a copy of the order.

3. Water quality problems. Discuss whether or not streams are listed in 305(b) report as not meeting uses or if any other documentation exist showing stream(s) not meeting uses.

3-3

4. Future environment without the proposed project.

Throughout

5. Discussion of any septic tank problems or straight pipe discharges. Include actual number of households on septic tanks, number of failing systems, number of straight pipes.

3-6

6. Discussion of capacity of existing facilities compared to projected growth.

Sections 4 and 6

D. Population Data

Section 6

1. Discuss the existing and projected population in the planning area by phases mentioned in IIA 1.a. Show current and projected populations for each phase.

E. Environmental Setting

1. Describe the water quality of the streams and lakes in the planning area. 3-3
2. Submit wasteload allocation (WLA) for each proposed new site or expansion/upgrade of existing site. Appendix B
3. Discuss existence or non-existence of wetlands in the planning area and show their location on a map in conjunction with the discharge point and any proposed pipes. 3-6
4. Provide map showing the 100 year floodplain in relation to the PA. Fig 3.04-1
5. Discuss the topography of the PA and its effect on sewage treatment/collection. 3-1
6. Discuss the geology and groundwater of the PA and its' effect on sewage treatment/collection. 3-1
7. Discuss the soils in the PA and their relation to on-site sewage disposal. 3-2

III. Analysis of Alternatives

1. Discuss the "No Action" alternative. Section 7
2. Discuss the possibility of regionalization. Section 7
3. *Discuss design criteria used to evaluate alternatives. Complete Unit Process Design Criteria and Design Flows and Concentrations forms.* Section 7
4. For treatment processes, discuss at least three alternatives. *Include schematic showing the number of units/tanks in each process for each alternative.* N/A
5. For collection systems, discuss at least two alternatives. Section 7

6. For the 0-2 year phase, i.e., current project, provide a 20 year present worth analysis. Also, provide a non-monetary evaluation of the alternatives considering implementability, environmental impact, engineering evaluation, public support and regionalization for subsequent phases, simply provide cost estimates.

Section 7

Selected Alternatives

1. Provide a schematic flow diagram showing all major process features.
2. Summarize the basis of design including detention times, overflow rates, process loadings, initial and design flows and other aspects of the preliminary basis of design.
3. For collection systems, show length and size of all pipes and for pump stations show horsepower, head, and GPM capacity.
4. If earthen basins are proposed, provide schematic and cross section showing dimensions and side slopes.

Section 7

Section 7

Section 7

N/A

IV. Implementability of the Project

- A. Legal authority of the applicant.
- B. Concurrence by all involved entities. All cities, counties, sanitation districts or other legally formed entities that are wholly or partially within the planning area must concur with the project. Copies of resolutions or contracts should be included as part of the proposal.
- C. User Costs
 1. Provide a discussion of the current and projected user costs.
 2. Provide a discussion of projected sources of funding. If more than one funding package is discussed, provide projected user rates for each.

✓

Appendix B

Section 8

Section 8

V. Public Participation

- A. Provide a copy of the public hearing transcript. This hearing must cover the description and effects of all alternatives, selected alternatives, proposed user cost and proposed method of financing.
- B. Provide a copy of the public hearing notice. The notice must be advertised in the paper of largest circulation for the area and be advertised 7-21 days in advance of the hearing date.
- C. Provide copies of any written comments.

Appendix X

Appendix I

VI. National Environmental Policy Act

- A. The Division of Water sends all projects through the State Clearinghouse. It is not necessary for the applicant to send the project through the Clearinghouse. However, if you suspect the need for an archeological or vegetative survey, you may choose to send it through the Clearinghouse in the early stages of your planning.

N/A

N/A

VII. P.E. Stamp

- A. *The facilities plan and all loose items, such as unbounded drawings, must bear the stamp and signature of a licensed professional engineer of the Commonwealth of Kentucky.*

✓

WLC/hlm 6-15-01

Note: Latest revisions from previous Checklist are italicized.

APPENDIX E
CORRESPONDENCE AND WASTELOAD ALLOCATION

COUNCIL
EDNA BALE BERGER
ANTHONY J. BISHOP
MARTY E. FULKERSON
RONALD B. THOMAS
TIM C. WALKER
WILLIAM G. WOOD



200 West Dixie Avenue
P. O. Box 550
Elizabethtown, KY 42702
(270) 765-6121
Fax: (270) 737-5362
Web Site: www.etownky.org

CITY OF ELIZABETHTOWN
DAVID L. WILLMOTH, JR., MAYOR

February 20, 2006

Mark Sneve
Strand Associates, Inc.
325 West Main Street
Suite 710
Louisville, KY 40202

RE: Hardin County Regional Wastewater Planning Study

Dear Mark:

The City of Elizabethtown has reviewed the proposed county areas for service by the Elizabethtown Wastewater Treatment Facility. The method we used to evaluate the potential flows to the existing system is explained in the attachments.

Please note that this evaluation is very conceptual. Actual planning for any connection to the City's system would require detailed engineering. Also, it does not include an analysis of any capital or treatment costs associated with the treatment plant. Such conditions are yet to be examined.

Finally, this information has not been reviewed by the City Council. Any potential service to the county area will require approval by the Council.

Sincerely,

Charles Bryant, P.E.
Executive Assistant

CB/ko

Evaluation Method

1. Identify drainage basins and related existing sewer outfalls.
2. Calculate capacity restrictions of outfall line.
3. Categorize areas to be served based upon zoning/flow potential and service priority.
 - a. Existing City limits
 - b. Future potential City limits
 - c. Outside existing or potential City limits but within 201 planning area
 - d. Outside 201 area, no access available
 - e. Outside 201 area, access to WWTP needed
4. Compare potential flows with outfall capacity or availability.

Service Area	Service Priority	Peak (GPM) Flow	Existing (GPM) Flow	Existing (GPM) Capacity	Service Category
Upper Shaw Creek (Smithersville)	Future Limits or Planning Area				Okay - Future Limits or Planning Area
Mill Creek Branch (Airview Estates)	Future Limits or Planning Area				Okay - Future Limits or Planning Area
Billy Creek	Future Limits or Planning Area				Okay - Future Limits or Planning Area
Upper Freeman Creek	Future Limits or Planning Area				Okay - Future Limits or Planning Area
Upper Buffalo Creek	Future Limits or Planning Area				Okay - Future Limits or Planning Area
Buffalo Creek (Bardstown Road Area)	Future Limits or Planning Area				Okay - Future Limits or Planning Area
Middle Creek Branch (Thoroughbred Estates)	Future Limits or Planning Area				Okay - Future Limits or Planning Area
Valley Creek (Industrial Area)	Future Limits or Planning Area				Okay - Future Limits or Planning Area
Cedar Creek	Outside Planning Area			Not Applicable	Okay - Future Limits or Planning Area
Clear Creek	Outside Planning Area			Not Applicable	None - No Capacity Available
Upper Youngers Creek (Springfield Road)	Outside Planning Area			Not Applicable	None - No Capacity Available
Upper Valley Creek (Valley Creek Road)	County Service within Planning Area			None	Access to WWTP needed - Not available in City System
West Rhudes Creek (Cecilia)	Outside Planning Area			None	Access to WWTP needed
Upper West Rhudes Creek	Outside Planning Area			None	Access to WWTP needed
Rose Run (Glendale)	Outside Planning Area			None	Access to WWTP needed
Lower Valley Creek	Outside Planning Area			None	Access to WWTP needed
East Rhudes Creek	Outside Planning Area			None	Access to WWTP needed
North Upper Nolin River	Outside Planning Area			None	Access to WWTP needed
Upper Nolin River	Outside Planning Area			None	Access to WWTP needed
Nolin River	Outside Planning Area			None	Access to WWTP needed
Cox Run	Outside Planning Area			None	Access to WWTP needed
Dorsey Run (Sonora)	Outside Planning Area			None	Access to WWTP needed
Sandy Creek (Upton)	Outside Planning Area			None	Access to WWTP needed
Jackson Branch	Outside Planning Area			None	Access to WWTP needed

Access to WWTP

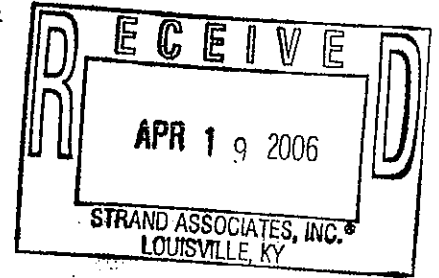
COUNCIL
EDNA BALE BERGER
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WILLIAM G. WOOD



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Web Site: www.ctownky.org

CITY OF ELIZABETHTOWN
DAVID L. WILLMOTH, JR., MAYOR

April 18, 2006



Mark Sneve
Strand Associates, Inc.
325 West Main Street
Suite 710
Louisville, KY 40202

RE: Hardin County Regional Wastewater Planning Study

Dear Mark:

I have reviewed with the Mayor and Council the request for information regarding collection and treatment of sanitary wastes from county areas by the City of Elizabethtown. The following items are proposed by the City as conditions for the referenced study.

1. The 201 Planning Area(s) should be reserved for the City (or cities). This will provide for a reasonable expansion of the City system in the foreseeable future and will assist the City in planning for annexation.
2. There should be no capital cost to the City except as explained in Item 4.
3. The treatment cost is proposed to be the City's uniform rate, which currently is \$2.40/1000 gallons. This rate is expected to increase to at least \$3.20/1000 gallons within 5 years. Yearly adjustment after that?
4. Capacity fees for the treatment works and any collection system utilized would be charged. The estimated treatment works fee is \$500. This is based upon a \$2.00/gallon net facility worth times 250 GPD average customer. The estimated collection system fee is \$1,500. This estimate is based upon a cost per acre for outfall line construction. These fees might be converted to a monthly charge for some period of time. (10, 20 years?)

We hope this information adequately addresses your needs for the study.

Sincerely,

Charles Bryant, P.E.
Executive Assistant

VINE GROVE WASTEWATER TREATMENT PLANT

May 4, 2006

Mark Sneve
Strand Associates, Inc.
325 West Main Street
Suite 710
Louisville, KY 40202

RE: Hardin County Regional Wastewater Planning Study

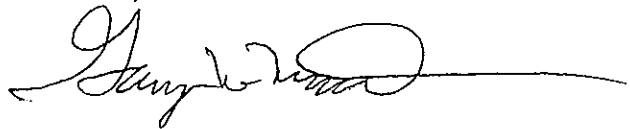
Dear Mark:

The City of Vine Grove currently has a large amount of new developments taking place within the city. We project the Wastewater Treatment Plant's daily average flow to be at or above 60% of the Plant's designed capacity by 2008. We have many new developments that are being proposed in the near future. With this in mind, the City of Vine Grove could not accept any county wastewater at this time without a plant expansion. We believe the cost for an expansion would need to be recovered by the county and not the residents who live within the city. Another possibility is the County could pay the up front cost for the capacity they would use for county wastewater. It is hard to quote a price to treat the county wastewater due to the fact we would need a plant expansion.

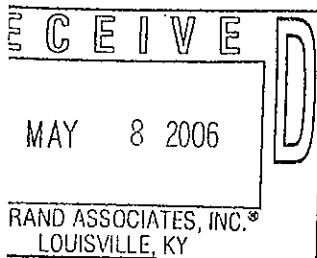
We are in the process of updating our 201 Facilities Plan. It should be completed this year. We will include the county planning areas in our Facilities Plan that could be served with sewer and possibly treated by our Wastewater Treatment Plant. We know that any sewer treated by our plant would need to be pumped to our plant with a force main. The cost of pumping the wastewater to our plant would have to be paid for by the county.

If we have a plant expansion due to the extra growth in our City and we have the needed capacity to treat county wastewater. The price to treat county wastewater would be \$ 5.00 per 1,000 gallons. This price is assuming that no new sewer rate increase is used to pay for the plant's expansion.

Sincerely,



Gary Minter
Mayor

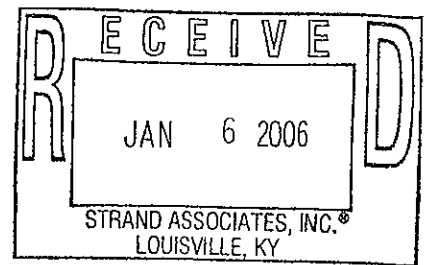


300 WEST MAIN STREET • VINE GROVE, KENTUCKY • 40175
PHONE: 270-877-2500 • FAX: 270-877-7629
E-MAIL: wastewater@vgcityhall.org

Hardin County Water District No. 1

Serving Radcliff and Hardin County for Over 50 Years

1400 Rogersville Road
Radcliff, KY. 40160



December 29, 2005

Mark A. Sneve, P.E.
Strand Associates, Inc.
Waterfront Plaza
Suite 710
325 West Main St.
Louisville, KY 40202

RE: Hardin County Regional Wastewater Planning - Information Request

Dear Mark;

Please find included the information you requested in the letter dated November 15, 2005. We are pleased to assist in any way possible and look forward to working with you and the other members of the advisory committee on this project.

Below you will find the information requested and the needed upgrades to handle the additional flows. Please keep in mind that these are estimates based on the information we have at this time. As you may or may not know, there are many changes forecasted in the coming months and years at Ft. Knox due to the Base Realignment And Closure (BRAC). Also, you will notice in the estimates that we do not expect a county sewer utility to bear all the cost of upgrading the needed facilities, as we will also benefit from these upgrades. We think the treatment plant has adequate capacity to handle the additional flows as projected. However, the main lines will need to be up-sized. The tables below show the two options for receiving flows and the associated cost estimates for up-sizing to handle the additional flow. Again, with the future BRAC projects these estimates are subject to change.

Option 1. Wilson Road Gate:

Size of Line (existing)	Size of Line (after upgrade)	Estimated Quantities	Total Cost for Up-sizing	Cost to District No. 1	Cost to County Sewer Utility
15"	18"	9,173 lf	\$1,192,490	\$1,009,030	\$183,460

Note: As these lines are VCP and are due to be replaced, only the cost of up-sizing is in the County Sewer Utility's cost estimates.

Mark Sneve
Hardin County Regional Wastewater Planning - Information Request
12/29/05

Option 2, Bullion Blvd. Gate:

Size of Line (existing)	Size of Line (after upgrade)	(1)Estimated Quantities	Total Cost for Up-sizing	Cost to District No. 1	(2)Cost to County Sewer Utility
12"	18"	2,173 lf	\$282,490	\$195,570	\$86,920

Note 1: Estimated quantity is 4,673 lf to be replaced minus 2,500 lf expected to be replaced by near future BRAC Action project.

Note 2: As in option 1, the District will pay to replace the existing sized line and the County Sewer Utility bears only the cost of up-sizing.

As for the cost to treat the wastewater, the price is based on today's best estimate and is subject to change in the future. The cost would be \$2.00 per one-thousand gallons. Just a reminder, as with all of our rates, this rate would also be subject to Public Service Commission (PSC) approval.

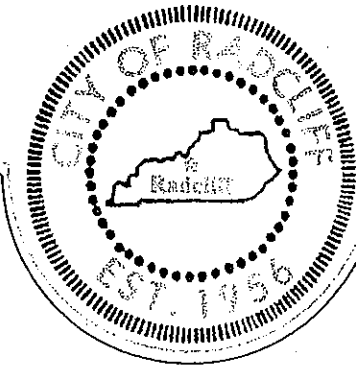
Hope this is useful. Please call or e-mail if you have any questions or comments.

Sincerely,



Brett Pyles, Operations Manager

cc; Jim Bruce, General Manager
Jeff Greer, Project Manager
file



February 9, 2006

Mark A. Sneve, P.E.
 Strand Associates, INC
 Waterfront Plaza
 325 West Main Street
 Louisville, Kentucky 40202

Re: Hardin County Regional Wastewater Planning – Information Request

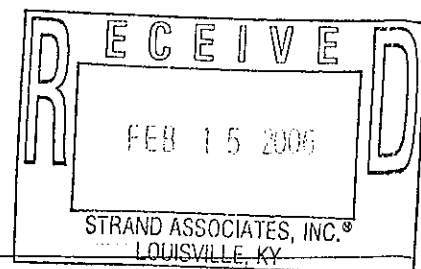
Dear Mr. Sneve:

I apologize for the time delay in responding to your request. After reviewing your request along with the City of Radcliff collection system and treatment facility, I have listed below the impacts and projected capital improvements for bringing county wastewater to our system. As for cost of capital improvements, we request your firm to calculate such cost and the county will be responsible for such cost.

- Due to our collection system layout and number of lift stations, we recommend any county wastewater be transported straight to the head works of the Treatment Plant. With that in mind, in order to accommodate the flows you have provided improvements will have to be done at our Plant's pretreatment area: Flow monitoring station and odor control system, bar screen and grit chamber improvements to handle the extra anticipated flow.
- Billing will be based on wholesale rate of actual gallons treated at plant. (Amount taken from flow monitoring station)
- Costs for Treatment only; \$ 4.10/1000gals
- Cost per hookup outside City Limits is \$1,000.00 dollars, as stated in ordinance.
- Costs amounts are subject to change at the discretion of the City Council.

Sincerely,

Sheila C. Enyart
 Mayor



Caveland

Mark Sneve - FW: Caveland - Hardin County community service questions

From: "Sam McIlwain" <smcillwain@wmsengineers.com>
To: "Mark Sneve" <Mark.Sneve@Strand.com>
Date: 5/5/2006 12:21 PM
Subject: FW: Caveland - Hardin County community service questions
CC: <david@ceawater.com>

Mark

As you may know, the Town of Bonnieville has two (2) projects that are or will soon be under construction. One of these projects is a collector sewer system and the second project is a sewage transmission project that will convey collected sewage to a connection point to CEA conveyance force main system previously constructed to service the I-65 Rest Areas north of Horse Cave. Once completed, these Bonnieville facilities will be operated and maintained by CEA. Sewer customers of the Bonnieville sewer system will pay a regular system wide CEA sewer bill, which is based on a rate of \$4.54 per 1,000 gallons. CEA's minimum bill is based on 2,000 gallons or \$9.08.

It is my understanding that the Bonnieville's two (2) projects were totally funded by grants and, therefore, there was no local share to be funded by rate payers. Had there have been a local share, a supplement agreement between CEA and Bonnieville would have been required. Under that supplemental agreement, one option would have been for CEA to collect a surcharge amount to fund debt payments for the local share. Those surcharged fees would have been paid to Bonnieville by CEA so that Bonnieville could meet their debt payments. While there are a number of other arrangements that could be used, the basic concept is that the CEA does not want to be obligated for any indebtedness for the Bonnieville sewer. As it turned out, there was no local indebtedness so that was not an issue for the Bonnieville projects.

Relative to your project, CEA completed an amendment to their Regional Facilities Plan for the Horse Cave Wastewater Treatment Plant in November of 2002. That amended plan contained provisions to serve Bonnieville and Upton, but not for the Sonora area. The concept developed in the amended facilities plan called for a manifold force main from Upton to the Horse Cave WWTP. However, the engineers for the Bonnieville projects modified that concept when they installed an intermediate pump station downstream of the Bonnieville Pump Station, thus interrupting the manifold concept.

The capacities of the Bonnieville and the Bonnieville intermediate pump station are 300 gpm each. The estimated 20 year peak flow from Bonnieville, is about 120 gpm leaving about 180 gpm in capacity for the Upton and Sonora Area. Because the manifold concept was changed, the Upton and Sonora Areas will have to be served by the Bonnieville pump station, thus requiring a flow equalization basin to be located at the first Bonnieville Pump Station in order to handle flows from Upton and Sonora. The Bonnieville Pump Station is located north of Campground Road in Bonnieville near the south bank of Bacon Creek. In addition to accommodating suppressing the 300 gpm flow rate from the Upton Pump Station, the flow equalization basin will need to be covered so septic odors can be contained and treated.

Therefore, in response to the questions of your letter, we offer the following responses.

1. *Location where force main or gravity sewers would have to be installed for each service area so to not overload you collection system.*

See the previous paragraph.

2. *Any capital costs required to be paid by these new customers as a result of their connection into your system. These costs may result from modifications the City may be required to do to accept their discharge. Please break these costs out by service area.*

My understanding of CEA position is the project to serve the Upton and Sonora area could be handled similar to the Bonnieville project. In other words, the facilities needed to collect and transport sewage to the Bonnieville pumping station (including the flow equalization and odor containment basin) will be constructed by the Upton and Sonora entity. CEA would then operate those facilities similar to their operating and maintaining the Bonnieville sewers and pump stations.

3. *The costs to be paid for wastewater conveyance and treatment by your POTW. Typically these cost are reported on a per 1,000 gallons basis and many include customer charges or other charges.*

Again going to the Bonnieville model, the charge would be \$4.54 per 1,000 gallons. On a customer basis, there would also be a minimum charge of \$9.08 for sewer uses of 2,000 gallons per month or less. Uses over 2,000 gallons per month would be \$9.08 plus \$4.54 per 1,000 gallons or fraction thereof. If there are local debts to be covered by sewer rates, CEA could impose a surcharge that would be paid back to the entities for payment of their indebtedness.

If you have any questions or comments, please give me a call at (615) 366-6088 or e-mail me.

Sam



front Plaza
710
West Main Street
Cave City, KY 40202
Phone: 502-583-7020
Fax: 502-583-7026

Locations

London, WI
Cave City, KY
Cave City, KY
Cave City, AL
Cave City, IN
Cave City, OH
Cave City, IN
Cave City, WI

strand.com

November 10, 2005

David J. Peterson, CEO/General Manager
Caveland Environmental Authority, Inc.
P.O. Box 463
Cave City, KY 42127

Re: Hardin County Regional Wastewater Planning - Information Request

Dear Mr. Peterson:

Strand Associates, Inc. is working with Hardin County Water District No. 2 to complete a comprehensive regional wastewater plan for Hardin County. We have developed possible alternatives for the study and request input from the Caveland Environmental Authority regarding the impacts and costs of bringing county wastewater to your collection system for transportation and treatment. Specifically, the plan is considering the following areas and flows (peak hourly and average daily) that may be served by your POTW:

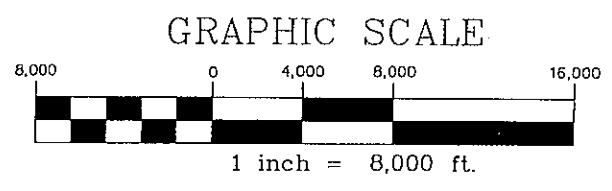
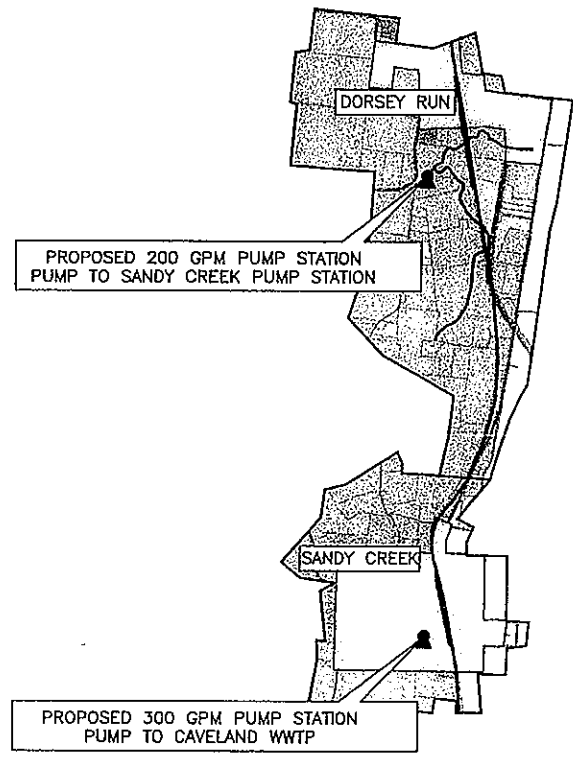
Service Area	By 2015		By 2025	
	Average Daily Flow (gpd)	Peak Hourly flow (gpm)	Average Daily Flow (gpd)	Peak Hourly flow (gpm)
Dorsey Run (Sonora)	58,000	200	67,000	200
Sandy Creek (Upton)	34,000	100	38,000	100

We have included a figure showing the location of these service areas and potential pump station locations.

We are requesting the following information be provided by the City:

1. Location where forcemains or gravity sewers would have to be installed to for each service area so as to not overload your collection system.
2. Any capital costs required to be paid by these new customers as a result of their connection into your system. These costs may result from modifications the City may be required to do to accept their discharge. Please break these costs out by service area.
3. The costs to be paid for wastewater conveyance and treatment by your POTW. Typically these costs are reported on a per 1000 gallons basis and may include customer charges or other charges.

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DESIGN YEAR 2015 AND 2025
UPTON AND SONORA SERVICE AREAS

REGIONAL FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT No.2
KENTUCKY

STRAND
ASSOCIATES, INC.[®]
ENGINEERS

FIGURE 11
JOB NO. 5-980-001

November 14, 2005

Ronald Yates, Water/Sewer Superintendent
City of Vine Grove
300 West Main Street
Vine Grove, Kentucky 40175

Re: Hardin County Regional Wastewater Planning - Information Request

Dear Mr. Yates:

Strand Associates, Inc. is working with Hardin County Water District No. 2 to complete a comprehensive regional wastewater plan for Hardin County. We have developed possible alternatives for the study and request input from the City of Vine Grove regarding the impacts and costs of bringing county wastewater to your collection system for transportation and treatment. Specifically, the plan is considering the following areas and flows (peak hourly and average daily) that may be served by your POTW:

Service Area	By 2015		By 2025	
	Average Daily Flow (gpd)	Peak Hourly flow (gpm)	Average Daily Flow (gpd)	Peak Hourly flow (gpm)
Upper Otter Creek (Boone Rd. Area)	206,000	1,100	304,000	(2)
Pawley Creek (Lavista Estate & Rineyville)	265,000	(1)	346,000	(2)
Brushy Fork (Burns-Deckard School Rd.)	314,000	750	427,000	1,000
Lower Otter Creek	----	----	135,000	2,000
Flippin Creek	----	----	106,000	280
Upper Pawley Creek	----	----	171,000	(2)

(1) Part of Upper Otter Creek Pump Station

(2) Part of Lower Otter Creek Pump Station

We have included figures showing the location of these service areas and potential pump station locations. Based on the location of these stations, several of them may either pump in a common forcemain or be double pumped.

We are requesting the following information be provided by the City:

1. Location where forcemains or gravity sewers would have to be installed to for each service area so as to not overload your collection system.
2. Any capital costs required to be paid by these new customers as a result of their connection into your system. These costs may result from modifications the City

Ronald Yates, Water/Sewer Superintendent
City of Vine Grove
Page 2
November 14, 2005

may be required to do to accept their discharge. Please break these costs out by service area.

3. The costs to be paid for wastewater conveyance and treatment by your POTW. Typically these costs are reported on a per 1000 gallons basis and may include customer charges or other charges.

We are available to review this request if you should have any questions. Please reply at your earliest opportunity as this information will be required to complete the alternatives evaluation in the County Facilities Plan. Thank you for your assistance.

Sincerely,

STRAND ASSOCIATES, INC.

Mark A. Sneve, P.E.

Attachment: Figures

cc: Dan Dorlack, HCWD2

November 15, 2005

Mr. Brett Pyles, Operations Manager
Hardin County Water District No. 1
1400 Rogersville Road
Radcliff, Kentucky 40160

Re: Hardin County Regional Wastewater Planning - Information Request

Dear Mr. Pyles:

Strand Associates, Inc. is working with Hardin County Water District No. 2 to complete a comprehensive regional wastewater plan for Hardin County. We have developed possible alternatives for the study and request input from the Fort Knox Wastewater Facilities regarding the impacts and costs of bringing county wastewater to your collection system for transportation and treatment. Specifically, the plan is considering the following areas and flows (peak hourly and average daily) that may be served by your facility:

Service Area	By 2015		By 2025	
	Average Daily Flow (gpd)	Peak Hourly flow (gpm)	Average Daily Flow (gpd)	Peak Hourly flow (gpm)
Upper Otter Creek (Boone Rd. Area)	206,000	1,100	304,000	1,400
Pawley Creek (Lavista Estate & Rineyville)	265,000	(1)	346,000	(1)
Brushy Fork (Burns-Deckard School Rd.)	314,000	750	427,000	1,000
Mill Creek	----	----	167,000	420
Cedar Creek	----	----	50,000	140

(1) Part of Upper Otter Creek Pump Station

We have included figures showing the location of these service areas and potential pump station locations. Based on the location of these stations, several of them may either pump in a common forcemain or be double pumped.

We are requesting the following information be provided by the City:

1. Location where forcemains or gravity sewers would have to be installed to for each service area so as to not overload your collection system.
2. Any capital costs required to be paid by these new customers as a result of their connection into your system. These costs may result from modifications the

Mr. Brett Pyles, Operations Manager
Hardin County Water District No. 1
Page 2
November 15, 2005

Utility may be required to do to accept their discharge. Please break these costs out by service area.

3. The costs to be paid for wastewater conveyance and treatment by the Fort Knox facility. Typically these costs are reported on a per 1000 gallons basis and may include customer charges or other charges.

We are available to review this request if you should have any questions. Please reply at your earliest opportunity as this information will be required to complete the alternatives evaluation in the County Facilities Plan. Thank you for your assistance.

Sincerely,

STRAND ASSOCIATES, INC.

Mark A. Sneve, P.E.

Attachment: Figures

cc: Dan Dorlack, HCWD2

November 16, 2005

Mr. Charlie Bryant, Executive Assistant
City of Elizabethtown
200 W. Dixie
P.O. Box 550
Elizabethtown, Kentucky 42702

Re: Hardin County Regional Wastewater Planning - Information Request

Dear Mr. Bryant:

Strand Associates, Inc. is working with Hardin County Water District No. 2 to complete a comprehensive regional wastewater plan for Hardin County. We have developed possible alternatives for the study and request input from the City of Elizabethtown regarding the impacts and costs of bringing county wastewater to your collection system for transportation and treatment. Specifically, the plan is considering the following areas and flows (peak hourly and average daily) that may be served by your POTW:

Service Area	By 2015		By 2025	
	Average Daily Flow (gpd)	Peak Hourly flow (gpm)	Average Daily Flow (gpd)	Peak Hourly flow (gpm)
Upper Shaw Creek (Smithersville)	182,000	460	341,000	800
Mill Creek Branch (Aireview Estate)	231,000	650	268,000	650
Buffalo Creek (Bardstown Rd. Area)	162,000	410	195,000	500
Upper Younger Creek (Springfield Road Area)	116,000	300	158,000	400
Middle Creek Branch (Thoroughbred Estate)	57,000	200	67,000	200
East Rhudes Creek (Oxmoor Village & Hodgenville)	255,000	620	332,000	(1)
North Upper Nolin River (Gilead Church - Glendale Rd.)	2,386,000	4,300	2,480,000	4,700
Rose Run (Glendale - North Glendale)	75,000	200	106,000	(1)
West Rhudes Creek (Cecilia)	113,000	300	131,000	(1)
Dorsey Run (Sonora)	58,000	300	67,000	300
Sandy Creek (Upton)	34,000	(2)	38,000	(2)
Valley Creek (Industrial Area)	594,000	1,300	1,243,000	2,500
Billy Creek	----	----	240,000	600
Upper West Rhudes Creek	----	----	89,000	(1)
Lower Valley Creek	----	----	31,000	(4)
Nolin River	----	----	48,000	220
Cox Run	----	----	22,000	(3)
Upper Nolin River	----	----	16,000	4700
Jackson Branch	----	----	83,000	(3)

Mr. Charlie Bryant, Executive Assistant
City of Elizabethtown
Page 2
November 16, 2005

Upper Valley Creek	----	----	158,000	400
Clear Creek	----	----	169,000	430
Upper Buffalo Creek	----	----	92,000	250
Upper Freeman Creek	----	----	66,000	180
Cedar Creek	----	----	50,000	140

- (1) Part of Lower Valley Creek Pump Station
- (2) Part of Dorsey Run Pump Station
- (3) Part of Upper Nolin Pump Station
- (4) Part of Nolin River Pump Station

We have included figures showing the location of these service areas and potential pump station locations. Based on the location of these stations, several of them may either pump in a common forcemain or be double pumped.

We are requesting the following information be provided by the City:

1. Location where forcemains or gravity sewers would have to be installed to for each service area so as to not overload your collection system.
2. Any capital costs required to be paid by these new customers as a result of their connection into your system. These costs may result from modifications the City may be required to do to accept their discharge. Please break these costs out by service area.
3. The costs to be paid for wastewater conveyance and treatment by your POTW. Typically these costs are reported on a per 1000 gallons basis and may include customer charges or other charges.

We are available to review this request if you should have any questions. Please reply at your earliest opportunity as this information will be required to complete the alternatives evaluation in the County Facilities Plan. Thank you for your assistance.

Sincerely,

STRAND ASSOCIATES, INC.

Mark A. Sneve, P.E.

Attachment: Figures

cc: Dan Dorlack, HCWD2

November 14, 2005

Julia Thurman, Wastewater Manager
 City of Radcliff
 411 West Lincoln Trail Blvd.
 P.O. Drawer 519
 Radcliff, Kentucky 40160

Re: Hardin County Regional Wastewater Planning - Information Request

Dear Ms. Thurman:

Strand Associates, Inc. is working with Hardin County Water District No. 2 to complete a comprehensive regional wastewater plan for Hardin County. We have developed possible alternatives for the study and request input from the City of Radcliff regarding the impacts and costs of bringing county wastewater to your collection system for transportation and treatment. Specifically, the plan is considering the following areas and flows (peak hourly and average daily) that may be served by your POTW:

Service Area	By 2015		By 2025	
	Average Daily Flow (gpd)	Peak Hourly flow (gpm)	Average Daily Flow (gpd)	Peak Hourly flow (gpm)
Upper Shaw Creek (Smithersville)	182,000	460	341,000	800
Upper Otter Creek (Boone Rd. Area)	206,000	1,100	304,000	(2)
Pawley Creek (Lavista Estate & Rineyville)	265,000	(1)	346,000	(2)
Brushy Fork (Burns-Deckard School Rd.)	314,000	750	427,000	1,000
Mill Creek Branch (Aireview Estate)	231,000	650	268,000	(3)
Mill Creek	----	----	167,000	1,000
Lower Otter Creek	----	----	135,000	2,000
Flippin Creek (moved from Rural)	----	----	106,000	280
Upper Pawley Creek	----	----	171,000	(2)
Billy Creek	----	----	240,000	600
Upper West Rhudes Creek	----	----	89,000	240

- (1) Part of Upper Otter Creek Pump Station
- (2) Part of Lower Otter Creek Pump Station
- (3) Part of Mill Creek Pump Station

Julia Thurman, Wastewater Manager
City of Radcliff
Page 2
November 10, 2005

We have included figures showing the location of these service areas and potential pump station locations. Based on the location of these stations, several of them may either pump in a common forcemain or be double pumped.

We are requesting the following information be provided by the City:

1. Location where forcemains or gravity sewers would have to be installed to for each service area so as to not overload your collection system.
2. Any capital costs required to be paid by these new customers as a result of their connection into your system. These costs may result from modifications the City may be required to do to accept their discharge. Please break these costs out by service area.
3. The costs to be paid for wastewater conveyance and treatment by your POTW. Typically these costs are reported on a per 1000 gallons basis and may include customer charges or other charges.

We are available to review this request if you should have any questions. Please reply at your earliest opportunity as this information will be required to complete the alternatives evaluation in the County Facilities Plan. Thank you for your assistance.

Sincerely,

STRAND ASSOCIATES, INC.

Mark A. Sneve, P.E.

Attachment: Figure

cc: Dan Dorlack, HCWD2

Typical Info
Request Letter

March 11, 2005

Mr. Charlie Bryant, Executive Assistant
City of Elizabethtown
200 W. Dixie
P.O. Box 550
Elizabethtown, Kentucky 42702

Re: Hardin County Regional Wastewater Planning
List of Information Requested

Dear Mr. Bryant:

Strand Associates, Inc. has been retained by Hardin County Water District No. 2 to complete a comprehensive regional wastewater plan for Hardin County. We anticipate the plan to consider use of your existing infrastructure. In anticipation of this, we hereby request the information listed below. Strand Associates will be happy to visit your office and assist you in gathering this information.

1. Copies of monthly DMRs from January 2002 to present,
2. Copies of other plant operation data not reported on DMRs from January 2002 to present,
3. Copies of current KPDES permit and any agreed orders currently in force or under development,
4. Copies of financial audits for the last 2 years, debt service schedule, and wastewater O&M cost breakdown (last 2 years),
5. Copy of present sewer use ordinance,
6. Copies of construction plans and specs for major wastewater pumping stations and the City WWTP (prepared by others),
7. Existing land use zoning map,
8. Areas of known or anticipated expansion of the sewer service area, with associated zoning,
9. Copies of present sewer service rate schedules, customer use group counts (including residential, commercial, institutional, and industrial users),
10. Location of unsewered areas within the existing sewer service area,
11. Copies of any previous wastewater planning documents (prepared by others),
12. Location and number of all known failing septic tanks and straight pipe discharges within the existing planning area,
13. Information on all known bypasses and overflows in the collection system including location and dates of bypasses and overflows, causes and duration of bypasses and overflows,

Mr. Charlie Bryant, Executive Assistant
City of Elizabethtown
Page 2
March 11, 2005

14. List of certified wastewater operators, their classification, license number, and years of experience,
15. Number of staff used for current operation and maintenance for the treatment plant and collection system,
16. Industrial discharge information (name, location, quantity of discharge, waste strength – 2 years of information), copies of industrial user permits,
17. List of operation or maintenance concerns for collection system components (sewers, interceptors, pumping stations, and force mains),
18. List of operation or maintenance concerns for wastewater treatment plant components,
19. Number of years each major pump station and the WWTP has been in service and the year(s) of any renovations.
20. Water use records for billing your sewer customers (2 years worth, sorted by user class, if possible),
21. Sludge/biosolids disposal information including tons removed the last three years, location of disposal, and copies of any permits associated with disposal,
22. Infiltration and inflow information including past studies/reports,
23. Current collection system map(s),
24. Copies of most recent construction drawings for WWTP (record drawings or as-builts), and
25. Copies of typical WWTP influent and effluent daily flow charts for dry weather day and wet weather day.

Thank you for your assistance. When possible, we prefer to receive electronic files for this data (CAD/GIS files for drawing/mapping data, Excel/Word files for the tabular data).

Strand Associates (with HCWD#2) personnel would like to make arrangements for a tour of your facilities in the next three weeks. We would be happy to assist in gathering this data at that time. We look forward to working with you as we discuss plans for wastewater treatment in Hardin County. If have any questions, please feel free to call give me a call.

Sincerely,

STRAND ASSOCIATES, INC.

Mark A. Sneve, P.E.



ERNIE FLETCHER
GOVERNOR

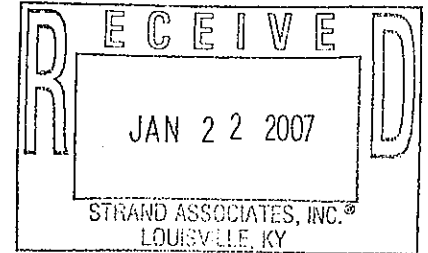
ENVIRONMENTAL AND PUBLIC PROTECTION CABINET

DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
14 REILLY ROAD

FRANKFORT, KENTUCKY 40601-1190
www.kentucky.gov

TERESA J. HILL
SECRETARY

January 18, 2007



Mark A. Sneve, P.E.
Strand Associates, Incorporated
Waterfront Plaza
Suite 710
325 West Main Street
Louisville, Kentucky 40202

Re: Preliminary Limits / Wastewater Facilities Plan
Hardin County Water District No. 2
Hardin County, Kentucky

Dear Mr. Sneve:

This is in response to your September 29, 2005 letter requesting wasteload allocations (WLAs) for potential new wastewater treatment plants (WWTPs) in Hardin County. The WLA information will be utilized in preparation of a Regional Wastewater Facilities Plan for the subject water district. Per your correspondence, three potential sites are being investigated:

- Nolin River WWTP - Proposed discharge is to segment 03026, at approximately mile point 93.1 of the Nolin River. Design capacities being considered are for a 3.5 mgd initial and 10.5 mgd ultimate facility.
- Proposed Younger Creek WWTP - Proposed discharge is to segment 12034, at approximately mile point 1.2 of Younger Creek. Design capacities being considered are for a 1.0 mgd initial and 3.0 mgd ultimate facility.
- Proposed Otter Creek WWTP - Proposed discharge is to segment 08044, at approximately mile point 19.7 of Otter Creek. Design capacities being considered are for a 2.0 mgd initial and 6.0 mgd ultimate facility.

We concur in this proposal with the following provisions:

Applicable effluent limitations for the proposed Nolin River and Otter Creek sites and design capacities are listed below. Please note that since the WWTP locations are approximate locations, no site surveys were conducted. Once specific sites are chosen for further consideration, please let me know so that site surveys can be conducted. Regional Office inspectors generally investigate to determine if a proposed facility is within the floodplain, the proximity of existing houses, the necessity of possible easements, etc.

Nolin River WWTP (approximate mile point 93.1)

Design Flow = 3.5 MGD

	<u>May 1 - October 31</u>	<u>November 1 - April 30</u>
CBOD ₅	25 mg/l	25 mg/l
Total Suspended Solids	30 mg/l	30 mg/l
Ammonia Nitrogen	20 mg/l	20 mg/l
Dissolved Oxygen	7 mg/l	7 mg/l
Total Residual Chlorine	0.011 mg/l	0.011 mg/l

Reliability Classification = Grade 1

Design Flow = 10.5 MGD

	<u>May 1 - October 31</u>	<u>November 1 - April 30</u>
CBOD ₅	25 mg/l	25 mg/l
Total Suspended Solids	30 mg/l	30 mg/l
Ammonia Nitrogen	10 mg/l	20 mg/l
Dissolved Oxygen	7 mg/l	7 mg/l
Total Residual Chlorine	0.011 mg/l	0.011 mg/l
Reliability Classification = Grade 1		

Otter Creek WWTP (approximate mile point 19.7)

Design Flow = 2.0 MGD or 6.0 MGD

	<u>May 1 - October 31</u>	<u>November 1 - April 30</u>
CBOD ₅	25 mg/l	25 mg/l
Total Suspended Solids	30 mg/l	30 mg/l
Ammonia Nitrogen	4 mg/l	10 mg/l
Dissolved Oxygen	7 mg/l	7 mg/l
Total Residual Chlorine	0.011 mg/l	0.011 mg/l
Reliability Classification = Grade 1		

In addition to the above limitations, the monthly geometric mean and weekly geometric mean values of E. Coli shall be at or below 130 colonies per 100 ml or 240 colonies per 100 ml, respectively, the year around. If a form of chlorine is proposed for wastewater disinfection, then dechlorination will be required by your Kentucky Pollutant Discharge Elimination System (KPDES) permit. Some suitable form of effluent post aeration may also be necessary in order to produce the required dissolved oxygen concentration. Additional effluent limitations and water quality standards are contained in the Division of Water Regulations.

Please note that the proposed Younger Creek site is not considered a viable option for location of a wastewater treatment facility. Wasteload allocation modeling indicates dissolved oxygen violations downstream of the proposed Younger Creek WWTP in the Rolling Fork River. Due to the relatively low flow of the Rolling Fork River, along with the combined effects of discharges from the proposed Younger Creek WWTP, facilities located on Beech Fork, and the Lebanon Junction WWTP, the assimilative capacity of the Rolling Fork River is not sufficient to accommodate the loading from the proposed Younger Creek WWTP.

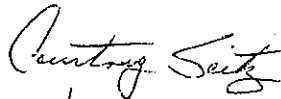
These preliminary design effluent limitations are valid for one (1) year from the date of this letter, and are subject to change as a result of additional information which may be presented during the public notice phase of the KPDES permitting process. Please note that this letter does not convey authorization or approval to proceed with the construction or operation of the proposed wastewater treatment facilities. Construction and KPDES permit applications must be submitted to request such authorization. Nor does this letter ensure the issuance of either permit. During the review processes of these permits the Division of Water will further evaluate the viability of the project.

On a personal note, please accept my apology for any inconvenience caused due to delays in providing this response. The backlog of preliminary WLA requests increased temporarily due to the WLA Coordinator position being vacant for several months. In addition, it has been necessary for the KPDES Branch to implement a permit backlog reduction initiative, which has required affected staff to reprioritize job duties, further impacting the backlog. However, a concerted effort is being made to reduce the backlog of preliminary WLA requests to facilitate a more timely response for future requests.

Mr. Mark A. Sneve
Hardin County Water District No. 2
Page Three

Should you have any questions regarding this letter, please contact me at (502) 564-2225, extension 465 or e-mail at Courtney.Seitz@ky.gov.

Sincerely,



Courtney Seitz, WLA Coordinator
KPDES Branch
Division of Water

CS:
c: Facilities Construction Branch
Louisville Regional Office
Division of Water Files

APPENDIX F
POPULATION PROJECTIONS AND ALTERNATIVES EVALUATION
FOR ELIZABETHTOWN WATERSHEDS

INTRODUCTION

During the development of this facilities plan, population projections were developed and alternatives were evaluated for 31 watersheds in Hardin County, KY. The City of Elizabethtown, KY updated and expanded their planning area during 2007 which included 10 of these watersheds. This section illustrates the population data and alternatives evaluation for those watersheds adopted by the city of Elizabethtown’s updated planning area.

POPULATION DATA

Table 1 lists the Year 2003 population data for watersheds adopted by the city of Elizabethtown’s planning area and indicates in which service area in the HCWD2 planning area they were considered.

Table 2 summarizes the projected 2017 and 2027 population data for the adopted watersheds. In the case of the Valley Creek Industrial Area, an equivalent population was developed to estimate anticipated industrial flow.

	2003 Population
Northern Service Area	
<i>0-10 year</i>	
Upper Shaw Creek (Smithersville)	541
<i>10-20 year</i>	
Upper Freeman Creek	453
Southern Service Area	
<i>0-10 year</i>	
East Rhudes Creek (Oxmoor Village & Hodgenville)	1944
Middle Creek Branch (Thoroughbred Estates)	485
West Rhudes Creek (Cecilia)	992
<i>10-20 year</i>	
Billy Creek	1298
Eastern Service Area	
<i>0-10 year</i>	
Buffalo Creek (Bardstown Rd Area)	1360
<i>10-20 year</i>	
Upper Valley Creek	1184
Upper Buffalo Creek	588
Valley Creek Service Area	
Valley Creek (New Glendale Road)	394
Valley Creek (Industrial Area)	353

**Table 1 Populations of Select Subwatersheds
(Year 2003)**

Northern Service Area	2017 Population	2027 Population
Upper Shaw Creek (Smithersville)	1,820	3,410
Upper Freeman Creek	N/A	660
Southern Service Area		
East Rhudes Creek (Oxmoor Village & Hodgenville)	2,550	3,320
Middle Creek Branch (Thoroughbred Estates)	570	670
West Rhudes Creek (Cecilia)	1,130	1,310
Billy Creek	N/A	2,400
Eastern Service Area		
Buffalo Creek (Bardstown Rd Area)	1,620	1,950
Upper Valley Creek	N/A	1,580
Upper Buffalo Creek	N/A	920
Valley Creek Service Area		
Valley Creek (New Glendale Road)	670	1,017
Valley Creek (Industrial Area)	5,270	11,410

Table 2 Elizabethtown Planning Area Watershed Population Projections

Table 3 illustrates the flows that can be expected at the Elizabethtown WWTP in Year 2017.

Watershed	Eq. Population	Peak Factor	ADF (gpd)	PHF (gpm)
Northern Service Area				
Upper Shaw Creek (Smithersville)	1,820	3.62	182,000	457
Southern Service Area				
East Rhudes Creek (Oxmoor Village & Hodgenville)	2,550	3.50	255,000	620
Middle Creek Branch (Thoroughbred Estates)	570	3.94	57,000	156
West Rhudes Creek (Cecilia)	1,130	3.77	113,000	295
Eastern Service Area				
Buffalo Creek (Bardstown Rd Area)	1,620	3.66	162,000	411
Valley Creek Service Area				
Valley Creek (New Glendale Road)	670	3.91	67,000	182
Valley Creek (Industrial Area)	5,270	3.22	527,000	1,180
Total Average Daily Flow to Elizabethtown WWTP	13,630	2.82	1,363,000	2,669

Table 3 Design Year 2017

The following table illustrates the flows that can be expected at the Elizabethtown WWTP in Year 2027.

Watershed	Eq. Population	Peak Factor	ADF (gpd)	PHF (gpm)
Northern Service Area				
Upper Shaw Creek (Smithersville)	3,410	3.39	341,000	804
Upper Freeman Creek	660	3.91	66,000	179
Southern Service Area				
East Rhudes Creek (Oxmoor Village & Hodgenville)	3,320	3.40	332,000	785
Middle Creek Branch (Thoroughbred Estates)	670	3.91	67,000	182
West Rhudes Creek (Cecilia)	1,310	3.72	131,000	339
Billy Creek	2,400	3.52	240,000	587
Eastern Service Area				
Buffalo Creek (Bardstown Rd Area)	1,950	3.59	195,000	487
Upper Valley Creek	1,580	3.66	158,000	402
Upper Buffalo Creek	920	3.82	92,000	244
Valley Creek Service Area				
Valley Creek (New Glendale Road)	1,020	3.79	102,000	269
Valley Creek (Industrial Area)	11,410	2.90	1,141,000	2,296
Additional Average Daily Flow in 2025	15,020	2.78	1,502,000	2,897
Total Average Daily Flow to Elizabethtown WWTP	28,650	2.50	2,865,000	4,968

Table 4 Design Year 2027

The following pages illustrate the alternatives evaluations for the watersheds adopted into the City of Elizabethtown's planning area. The Buffalo Creek, Upper Buffalo Creek, and Upper Valley Creek Watersheds only illustrate the alternative of conveying wastewater to the Elizabethtown collection system. These watersheds were evaluated to convey wastewater to the Younger Creek WWTP (the new proposed east county WWTP), but Kentucky Division of Water will not allow a WWTP to be constructed to discharge into Younger Creek.

TABLE 5

ELIZABETHTOWN ADOPTED WATERSHEDS 2017-UPPER SHAW CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives		
		Radcliff WWTP	Elizabethtown WWTP	Otter Creek WWTP
Population		1820	1820	1820
Residential Flow (mgd)		0.182	0.182	0.182
Industrial Flow (mgd)				
Total Flow (mgd)		0.182	0.182	0.182
Pumping Stations				
Number		2	1	2
Capacity (gpm)		460	460	460
		460		460
Gravity Interceptors (lf)				
	8	2,430	2,430	2,430
	10	3,950	3,950	3,950
	12	0	0	0
	15	1,070	1,070	1,070
Manholes (number)		30	30	30
Force Main (lf)				
	8	54,700	3,440	41,870
	10	0	0	0
	12	0	0	0
Total Present Worth				
Operation and Maintenance (20 yr)		\$7,185,000	\$4,814,000	\$5,682,000
Initial Capital Costs		\$5,747,000	\$2,930,000	5,785,000
Salvage				
Total Present Worth		\$12,932,000	\$7,744,000	\$11,467,000
Percent Greater Than Most Cost-Effective Alternative		67%	0%	48%

TABLE 6

ELIZABETHTOWN ADOPTED WATERSHEDS 2027-UPPER SHAW CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives		
		Radcliff WWTP	Elizabethtown WWTP	Otter Creek WWTP
Population		3410	3410	3410
Residential Flow (mgd)		0.341	0.341	0.341
Industrial Flow (mgd)				
Total Flow (mgd)		0.341	0.341	0.341
Pumping Stations				
Number		2	1	2
Capacity (gpm)		800	800	800
		800		800
Gravity Interceptors (lf)				
	8	0	0	0
	10	0	0	0
	12	0	0	0
	15	0	0	0
Manholes (number)		0	0	0
Force Main (lf)				
	8	0	0	0
	10	0	0	0
	12	0	0	0
Total Present Worth				
Operation and Maintenance (20 yr)		\$1,395,000	\$1,035,000	\$790,000
Initial Capital Costs		\$663,000	\$404,000	\$597,000
Salvage				
Total Present Worth		\$2,058,000	\$1,439,000	\$1,387,000
Percent Greater Than Most Cost-Effective Alternative		48%	4%	0%

TABLE 7

ELIZABETHTOWN ADOPTED WATERSHEDS 2027-UPPER FREEMAN CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives	
		Elizabethtown WWTP	Otter Creek WWTP
Population		660	660
Residential Flow (mgd)		0.066	0.066
Industrial Flow (mgd)			
Total Flow (mgd)		0.066	0.066
Pumping Stations			
Number		1	2
Capacity (gpm)		180	180
			180
Gravity Interceptors (lf)			
	8	3,970	3,970
	10	0	0
	12	0	0
	15	0	0
Manholes (number)		16	16
Force Main (lf)			
	4	5,770	73,380
	6	0	0
	8	0	0
Total Present Worth			
Operation and Maintenance (20 yr)		\$637,000	\$1,273,000
Initial Capital Costs		\$701,000	\$2,458,000
Salvage			
Total Present Worth		\$1,338,000	\$3,731,000
Percent Greater Than Most Cost-Effective Alternative		0%	179%

TABLE 8

ELIZABETHTOWN ADOPTED WATERSHEDS 2017- BUFFALO CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives
Population		1620
Residential Flow (mgd)		0.162
Industrial Flow (mgd)		
Total Flow (mgd)		0.162
Pumping Stations		
Number		1
Capacity (gpm)		400
Gravity Interceptors (lf)		
	8	0
	10	7,900
	12	0
	15	0
Manholes (number)		32
Force Main (lf)		
	4	0
	6	4,990
	8	0
Total Present Worth		
Operation and Maintenance (20 yr)		\$4,104,000
Initial Capital Costs		\$2,573,000
Salvage		
Total Present Worth		\$6,677,000
Percent Greater Than Most Cost-Effective Alternative		N/A

TABLE 9

ELIZABETHTOWN ADOPTED WATERSHEDS 2027- BUFFALO CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives
Population		1,950
Residential Flow (mgd)		0.195
Industrial Flow (mgd)		
Total Flow (mgd)		0.195
Pumping Stations		
Number		1
Capacity (gpm)		500
Gravity Interceptors (lf)		
	8	0
	10	0
	12	0
	15	0
Manholes (number)		0
Force Main (lf)		
	4	0
	6	4,990
	8	0
Total Present Worth		
Operation and Maintenance (20 yr)		\$515,000
Initial Capital Costs		\$210,000
Salvage		
Total Present Worth		\$725,000
Percent Greater Than Most Cost-Effective Alternative		N/A

TABLE 10

ELIZABETHTOWN ADOPTED WATERSHEDS 2027- UPPER BUFFALO CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives
Population		920
Residential Flow (mgd)		0.092
Industrial Flow (mgd)		
Total Flow (mgd)		0.092
Pumping Stations		
Number		1
Capacity (gpm)		250
Gravity Interceptors (lf)		
	8	11,800
	10	0
	12	0
	15	0
Manholes (number)		47
Force Main (lf)		
	6	38,810
	8	0
	10	0
Total Present Worth		
Operation and Maintenance (20 yr)		\$1,040,000
Initial Capital Costs		\$1,345,000
Salvage		
Total Present Worth		\$2,385,000
Percent Greater Than Most Cost-Effective Alternative		N/A

TABLE 11

ELIZABETHTOWN ADOPTED WATERSHEDS 2027- UPPER VALLEY CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives
Population		1,580
Residential Flow (mgd)		0.158
Industrial Flow (mgd)		0
Total Flow (mgd)		0.158
Pumping Stations		
Number		1
Capacity (gpm)		400
Gravity Interceptors (lf)		
	8	32,220
	10	0
	12	0
	15	0
Manholes (number)		129
Force Main (lf)		
	8	14,590
	10	0
	12	0
Total Present Worth		
Operation and Maintenance (20 yr)		\$2,049,000
Initial Capital Costs		\$2,960,000
Total Present Worth		\$5,009,000
Percent Greater Than Most Cost-Effective Alternative		N/A

TABLE 12

ELIZABETHTOWN ADOPTED WATERSHEDS 2017- VALLEY CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives
Population		5,940
Residential Flow (mgd)		0.594
Industrial Flow (mgd)		
Total Flow (mgd)		0.594
Pumping Stations		
Number		1
Capacity (gpm)		500
Gravity Interceptors (lf)		
	8	0
	10	0
	12	0
	15	5,860
Manholes (number)		23
Force Main (lf)		
	8	0
	10	5,860
	12	0
 Total Present Worth		
Operation and Maintenance (20 yr)		\$10,143,000
Initial Capital Costs		\$2,513,000
Salvage		
Total Present Worth		\$12,656,000
Percent Greater Than Most Cost-Effective Alternative		N/A

TABLE 13

ELIZABETHTOWN ADOPTED WATERSHEDS 2027- VALLEY CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives
Population		12,430
Residential Flow (mgd)		1.243
Industrial Flow (mgd)		
Total Flow (mgd)		1.243
Pumping Stations		
Number		1
Capacity (gpm)		800
Gravity Interceptors (lf)		
	8	0
	10	0
	12	0
	15	0
Manholes (number)		0
Force Main (lf)		
	8	0
	10	0
	12	0
Total Present Worth		
Operation and Maintenance (20 yr)		\$3,624,000
Initial Capital Costs		\$738,000
Salvage		
Total Present Worth		\$4,362,000
Percent Greater Than Most Cost-Effective Alternative		N/A

TABLE 14

ELIZABETHTOWN ADOPTED WATERSHEDS 2017- EAST RHUDES CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives	
		Elizabethtown WWTP	Nolin River WWTP
Population		2,550	2,550
Residential Flow (mgd)		0.255	0.255
Industrial Flow (mgd)			
Total Flow (mgd)		0.255	0.255
Pumping Stations			
Number		1	1
Capacity (gpm)		620	620
Gravity Interceptors (lf)			
	8	14,900	14,900
	10	0	0
	12	0	0
	15	0	0
Manholes (number)		60	60
Force Main (lf)			
	8	0	0
	10	14,020	35,720
	12	0	0
Total Present Worth			
Operation and Maintenance (20 yr)		\$6,870,000	\$6,376,000
Initial Capital Costs		\$4,713,000	\$6,367,000
Salvage			
Total Present Worth		\$11,583,000	\$12,743,000
Percent Greater Than Most Cost-Effective Alternative		0%	10%

TABLE 15

ELIZABETHTOWN ADOPTED WATERSHEDS 2027- EAST RHUDES CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives	
		Elizabethtown WWTP	Nolin River WWTP
Population		3,320	3,320
Residential Flow (mgd)		0.332	0.332
Industrial Flow (mgd)			
Total Flow (mgd)		0.332	0.332
Pumping Stations			
Number		1	1
Capacity (gpm)		790	790
Gravity Interceptors (LF)			
	8	0	0
	10	11,790	11,790
	12	0	0
	15	0	0
Manholes (number)		47	47
Force Main (LF)			
	8	0	0
	10	5,930	27,880
	12	0	0
Total Present Worth			
Operation and Maintenance (20 yr)		\$1,099,000	\$1,527,000
Initial Capital Costs		\$1,380,000	\$2,671,000
Salvage			
Total Present Worth		\$2,479,000	\$4,198,000
Percent Greater Than Most Cost-Effective Alternative		0%	69%

TABLE 16

ELIZABETHTOWN ADOPTED WATERSHEDS 2017- MIDDLE CREEK BRANCH WATERSHED

	Size (in)	Conveyance and Treatment Alternatives	
		Elizabethtown WWTP	Nolin River WWTP
Population		570	570
Residential Flow (mgd)		0.057	0.057
Industrial Flow (mgd)			
Total Flow (mgd)		0.057	0.057
Pumping Stations			
Number		2	2
Capacity (gpm)		200	200
		200	200
Gravity Interceptors (LF)			
	8	7,320	7,320
	10	0	0
	12	0	0
	15	0	0
Manholes (number)		29	29
Force Main (LF)			
	4	0	0
	6	45,870	60,130
	8	0	0
Total Present Worth			
Operation and Maintenance (20 yr)		\$3,809,000	\$3,888,000
Initial Capital Costs		\$4,312,000	\$5,154,000
Salvage			
Total Present Worth		\$8,121,000	\$9,042,000
Percent Greater Than Most Cost-Effective Alternative		0%	11%

TABLE 17

ELIZABETHTOWN ADOPTED WATERSHEDS 2027- MIDDLE CREEK BRANCH WATERSHED

	Size (in)	Conveyance and Treatment Alternatives	
		Elizabethtown WWTP	Nolin River WWTP
Population		670	670
Residential Flow (mgd)		0.067	0.067
Industrial Flow (mgd)			
Total Flow (mgd)		0.067	0.067
Pumping Stations			
Number		0	0
Capacity (gpm)			
Gravity Interceptors (LF)			
	8	0	0
	10	0	0
	12	0	0
	15	0	0
Manholes (number)		0	0
Force Main (LF)			
	4	0	0
	6	0	0
	8	0	0
Total Present Worth			
Operation and Maintenance (20 yr)		\$129,000	\$99,000
Initial Capital Costs		\$34,000	\$21,000
Salvage			
Total Present Worth		\$163,000	\$120,000
Percent Greater Than Most Cost-Effective Alternative		36%	0%

TABLE 18

ELIZABETHTOWN ADOPTED WATERSHEDS 2017- WEST RHUDES CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives	
		Elizabethtown WWTP	Nolin River WWTP
Population		1,130	1,130
Residential Flow (mgd)		0.113	0.113
Industrial Flow (mgd)		0	0
Total Flow (mgd)		0.113	0.113
Pumping Stations			
Number		1	1
Capacity (gpm)		300	300
Gravity Interceptors (lf)			
	8	0	0
	10	0	0
	12	6,780	6,780
	15	0	0
Manholes (number)		27	27
Force Main (lf)			
	6	11,680	25,480
	8	0	0
	10	0	0
Total Present Worth			
Operation and Maintenance (20 yr)		\$3,342,000	\$3,180,000
Initial Capital Costs		\$2,537,000	\$3,355,000
Salvage			
Total Present Worth		\$5,879,000	\$6,535,000
Percent Greater Than Most Cost-Effective Alternative		0%	11%

TABLE 19

ELIZABETHTOWN ADOPTED WATERSHEDS 2027- WEST RHUDES CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives	
		Elizabethtown WWTP	Nolin River WWTP
Population		1,310	1,310
Residential Flow (mgd)		0.131	0.131
Industrial Flow (mgd)		0	0
Total Flow (mgd)		0.131	0.131
Pumping Stations			
Number		1	1
Capacity (gpm)		340	340
Gravity Interceptors (LF)			
	8	15,930	15,930
	10	3,250	3,250
	12	0	0
	15	8,890	8,890
Manholes (number)		112	112
Force Main (LF)			
	6	14,060	21,560
	8	0	0
	10	0	0
Total Present Worth			
Operation and Maintenance (20 yr)		\$1,108,000	\$1,279,000
Initial Capital Costs		\$2,296,000	\$2,738,000
Salvage			
Total Present Worth		\$3,404,000	\$4,017,000
Percent Greater Than Most Cost-Effective Alternative		0%	18%

TABLE 20

ELIZABETHTOWN ADOPTED WATERSHEDS 2027- BILLY CREEK WATERSHED

	Size (in)	Conveyance and Treatment Alternatives	
		Elizabethtown WWTP	Nolin River WWTP
Population		2,400	2,400
Residential Flow (mgd)		0.24	0.24
Industrial Flow (mgd)			
Total Flow (mgd)		0.24	0.24
Pumping Stations			
Number		1	2
Capacity (gpm)		600	600
Gravity Interceptors (LF)			
	8	28,770	28,770
	10	8,690	8,690
	12	0	0
	15	0	0
Manholes (number)		150	150
Force Main (LF)			
	8	6,540	47,380
	10	0	0
	12	0	0
Total Present Worth			
Operation and Maintenance (20 yr)		\$2,621,000	\$2,790,000
Initial Capital Costs		\$3,316,000	\$4,658,000
Salvage			
Total Present Worth		\$5,937,000	\$7,448,000
Percent Greater Than Most Cost-Effective Alternative		0%	25%

INTRODUCTION

The costs of alternatives presented in this facilities plan are based on total present worth. The present worth analysis was used for the purpose of comparing the monetary costs of the alternatives evaluated.

The total present worth of an alternative is the amount of money needed to build, operate, and maintain the system over a 20-year period.

BASIS OF COST ANALYSIS

A. Discount Rate

The discount rate used for all present worth calculations is 7.00%. This is the annual percentage rate at which future sums were discounted on a compounded basis to determine their present value.

B. Construction Costs

Construction cost data was obtained by contacting area contractors and by examining Strand Associates files for other projects. The costs shown include installation of the structures and equipment.

C. Operations and Maintenance Costs

Operations and maintenance costs were computed in several ways. Municipal WWTPs were contacted to estimate the costs new customers would be charged for use of their WWTPs. The O&M costs for the new proposed WWTPs was computed by examining O&M costs for WWTPs of similar capacity. Pumping station and collection system O&M costs were projected by utilizing data from several wastewater treatment municipalities. Administration costs were estimated from data from other Strand Associates project files. Replacement costs were predicted from data from other Strand Associates project files. Debt costs were based on approximate interest rates on Kentucky state loans for water and wastewater construction projects.

D. Professional Services and Contingencies

Professional services including engineering, legal, bond counsel, interest during construction, and contingencies were estimated to be 40 percent of the estimated construction cost.

E. General Conditions

General conditions including a bid bond, performance bond, payment bonds, and insurance costs were estimated to be 8% of the estimated construction costs.

F. Easements, Restoration and EPSC

Easements, pavement and driveway restoration, and erosion and sediment control measures were estimated at 0.5%, 10%, and 1.5%, respectively, of the estimated construction costs for piping. These costs were obtained by looking at data from similar historic projects.

G. Total Present Worth

The procedures and assumptions for calculating total present worth are as follows:

1. Alternatives evaluated under Design Year 2015 were assumed to be constructed at year 0. Total present worth was calculated by adding the capital cost plus the present worth of a 20 year annuity of operation and maintenance cost.
2. Alternatives evaluated under Design Year 2025 were assumed to be constructed at year 10. Total present worth was calculated by adding the present worth of the capital costs discounted back to year 0, and the present worth of a 10 year annuity of operations and maintenance costs discounted back to year 0.

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	North Fork Creek
Alternative	Wind Creek WWTP
Design Year	2017
Design Population	3140
Design Industrial Acres	0

Impact to Existing Utility: New force main proposed to be tied into existing WWTP
Expand Existing WWTP

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$75.00	PER LF	816	\$ 612,700
10-INCH	\$70.00	PER LF	827	\$ 585,000
12-INCH	\$55.00	PER LF	847	\$ 466,050
15-INCH	\$70.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
21-INCH	\$90.00	PER LF	0	\$ -
24-INCH	\$100.00	PER LF	0	\$ -
27-INCH	\$110.00	PER LF	0	\$ -
30-INCH	\$120.00	PER LF	0	\$ -
33-INCH	\$130.00	PER LF	0	\$ -
36-INCH	\$140.00	PER LF	0	\$ -
42-INCH	\$160.00	PER LF	0	\$ -
48-INCH	\$180.00	PER LF	0	\$ -
MANHOLES	\$2,500.00	EACH	112	\$ 280,000
FORCE MAIN				
4-INCH	\$30.00	PER LF	0	\$ -
6-INCH	\$35.00	PER LF	0	\$ -
8-INCH	\$40.00	PER LF	0	\$ -
10-INCH	\$45.00	PER LF	2210	\$ 994,950
12-INCH	\$50.00	PER LF	0	\$ -
14-INCH	\$60.00	PER LF	0	\$ -
16-INCH	\$70.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
24-INCH	\$90.00	PER LF	0	\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	1500	\$ 212,500
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	0	\$ -
PUMP STATION		GPM	0	\$ -
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD	0	\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO EXISTING COLLECTION SYSTEM				
EXPAND EXISTING WWTP	\$4.00	AVE GPD	314,000	\$ 1,256,000
SUBTOTAL BASE COST				\$ 4,407,200
EASEMENTS	0.5%			\$ 22,036
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 440,720
EROSION AND SEDIMENT CONTROL	1.5%			\$ 66,108
GENERAL CONDITIONS	8%			\$ 352,576
SUBTOTAL CONSTRUCTION COST				\$ 5,288,640
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 2,115,456
TOTAL CAPITAL COST OPINION**				\$ 7,404,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$5.00	1000 GAL	114,640	\$ 573,050
PUMPING STATIONS	\$80.00	GPM	562	\$ 45,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	50,170	\$ 5,017
ADMINISTRATION	\$0.25	1000 GAL	114,640	\$ 28,653
REPLACEMENT	\$0.00	1000 GAL	0	\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	1,110,053	\$ 156,144
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	5,288,640	\$ 307,049
TOTAL ANNUAL O&M				\$ 1,114,912
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	20	\$ 11,811,000
PRESENT WORTH OF CAPITAL				\$ 7,404,000
TOTAL 20-YEAR PRESENT WORTH				\$ 19,215,000

**Property Owner will be responsible for cost to connect structure to new sewer
40% contingency is used to account for current variability in pipe and fuel costs
Salvage value is excluded from present worth analysis
Collector sewers cost are excluded from this analysis since they are common to all alternatives
All costs in 3rd quarter 2007 dollars

DESCRIPTION

Jardin County Regional Facilities Plan

Service Area	Bolshy Earth Creek
Alternative	Earth Creek WWTP
Design Year	2017
Design Population	3,140
Design Industrial Acres	0

Impact to Existing Utility: Upgrade Existing Collection System

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	11,111	\$ 612,700
10-INCH	\$60.00	PER LF	9,583	\$ 585,000
12-INCH	\$65.00	PER LF	7,077	\$ 466,050
15-INCH	\$70.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
21-INCH	\$90.00	PER LF	0	\$ -
24-INCH	\$100.00	PER LF	0	\$ -
27-INCH	\$110.00	PER LF	0	\$ -
30-INCH	\$120.00	PER LF	0	\$ -
33-INCH	\$130.00	PER LF	0	\$ -
36-INCH	\$140.00	PER LF	0	\$ -
42-INCH	\$160.00	PER LF	0	\$ -
48-INCH	\$180.00	PER LF	0	\$ -
MANHOLES	\$2,500.00	EACH	112	\$ 280,000
FORCE MAIN				
4-INCH	\$30.00	PER LF	0	\$ -
6-INCH	\$35.00	PER LF	0	\$ -
8-INCH	\$40.00	PER LF	0	\$ -
10-INCH	\$45.00	PER LF	26,570	\$ 1,150,650
12-INCH	\$50.00	PER LF	0	\$ -
14-INCH	\$60.00	PER LF	0	\$ -
16-INCH	\$70.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
24-INCH	\$90.00	PER LF	0	\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	750	\$ 212,500
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	0	\$ -
PUMP STATION		GPM	0	\$ -
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD	0	\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO COLLECTION SYSTEM		LUMP SUM		\$ 185,000
SUBTOTAL BASE COST				\$ 3,491,900
EASEMENTS	5.0%			\$ 17,460
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 349,190
EROSION AND SEDIMENT CONTROL	15%			\$ 52,379
GENERAL CONDITIONS	8%			\$ 279,352
SUBTOTAL CONSTRUCTION COST				\$ 4,190,280
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,676,112
TOTAL CAPITAL COST OPINION**				\$ 5,866,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$22.00	1000 GAL	10,500	\$ 229,220
PUMPING STATIONS	\$80.00	GPM	750	\$ 45,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	53,850	\$ 5,385
ADMINISTRATION	\$0.25	1000 GAL	114,610	\$ 28,653
REPLACEMENT	\$0.00	1000 GAL	N/A	\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	N/A	\$ -
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	5,866,000	\$ 340,228
TOTAL ANNUAL O&M				\$ 648,464
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	20	\$ 6,870,000
PRESENT WORTH OF CAPITAL				\$ 5,866,000
TOTAL 20-YEAR PRESENT WORTH				\$ 12,736,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan
 Service Area: Brushy Fork Creek
 Alternative: New Northern WWTP
 Design Year: 2017
 Design Population: 3140
 Design Industrial Acres: 0

Impact to Existing Utility: Not Applicable

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	1140	\$ 612,700
10-INCH	\$50.00	PER LF	1150	\$ 585,000
12-INCH	\$65.00	PER LF	700	\$ 466,050
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	12	\$ 280,000
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF		\$ -
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF	32,000	\$ 1,440,000
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	750	\$ 212,500
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM		
PUMP STATION		GPM		
WASTEWATER TREATMENT PLANT	\$5.00	AVE GPD	314,000	\$ 1,570,000
SUBTOTAL BASE COST				\$ 5,166,250
EASEMENTS	0.5%			\$ 25,831
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 516,625
EROSION AND SEDIMENT CONTROL	1.5%			\$ 77,494
GENERAL CONDITIONS	8%			\$ 413,300
SUBTOTAL CONSTRUCTION COST				\$ 6,199,500
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 2,479,800
TOTAL CAPITAL COST OPINION**				\$ 8,679,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$31.00	1000 GAL	3610	\$ 114,810
PUMPING STATIONS	\$80.00	GPM	750	\$ 45,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	6060	\$ 6,060
ADMINISTRATION	\$0.50	1000 GAL	1470	\$ 57,305
REPLACEMENT	\$0.25	1000 GAL	1146	\$ 28,653
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	1957509	\$ 195,176
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	5000000	\$ 350,408
TOTAL ANNUAL O&M				\$ 797,158
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	20	\$ 8,445,000
PRESENT WORTH OF CAPITAL				\$ 8,679,000
TOTAL 20-YEAR PRESENT WORTH				\$ 17,124,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area

Blaisy Fork Creek

Alternative

Radcliff WWTP

Design Year

2017

Design Population

13140

Design Industrial Acres

0

Impact to Existing Utility: New force main proposed to be tied into new headworks
New headworks
\$1000 Connection Charge per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	1112.00	\$ 612,700
10-INCH	\$80.00	PER LF	725.00	\$ 585,000
12-INCH	\$65.00	PER LF	720.00	\$ 466,050
15-INCH	\$70.00	PER LF	-	\$ -
18-INCH	\$80.00	PER LF	-	\$ -
21-INCH	\$90.00	PER LF	-	\$ -
24-INCH	\$100.00	PER LF	-	\$ -
27-INCH	\$110.00	PER LF	-	\$ -
30-INCH	\$120.00	PER LF	-	\$ -
33-INCH	\$130.00	PER LF	-	\$ -
36-INCH	\$140.00	PER LF	-	\$ -
42-INCH	\$160.00	PER LF	-	\$ -
48-INCH	\$180.00	PER LF	-	\$ -
MANHOLES	\$2,500.00	EACH	112.00	\$ 280,000
FORCE MAIN				
4-INCH	\$30.00	PER LF	-	\$ -
6-INCH	\$35.00	PER LF	-	\$ -
8-INCH	\$40.00	PER LF	-	\$ -
10-INCH	\$45.00	PER LF	22,680.00	\$ 1,016,100
12-INCH	\$50.00	PER LF	-	\$ -
14-INCH	\$60.00	PER LF	-	\$ -
16-INCH	\$70.00	PER LF	-	\$ -
18-INCH	\$80.00	PER LF	-	\$ -
24-INCH	\$90.00	PER LF	-	\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	750.00	\$ 212,500
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	-	\$ -
PUMP STATION		GPM	-	\$ -
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD	-	\$ -
IMPACT TO EXISTING UTILITY				
NEW HEADWORKS	\$25.100	AVE GPD	12,000.00	\$ 314,000
SUBTOTAL BASE COST				\$ 3,486,350
EASEMENTS				
	0.5%			\$ 17,432
RESTORATION (PAVEMENT AND DRIVEWAY)				
	10%			\$ 348,635
EROSION AND SEDIMENT CONTROL				
	1.5%			\$ 52,295
GENERAL CONDITIONS				
	8%			\$ 278,908
SUBTOTAL CONSTRUCTION COST				\$ 4,183,620
CONTINGENCY AND TECHNICAL SERVICE				
	40%			\$ 1,673,448
IMPACT TO EXISTING UTILITY				
CONNECTION CHARGE	\$1,000.00	PER CUSTOMER	1,047.00	\$ 1,047,000
TOTAL CAPITAL COST OPINION**				\$ 6,904,000
ANNUAL OPERATION& MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$32.10	1000 GAL	14,610.00	\$ 469,901
PUMPING STATIONS	\$60.00	GPM	750.00	\$ 45,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	50,640.00	\$ 5,064
ADMINISTRATION	\$0.25	1000 GAL	114,910.00	\$ 28,653
REPLACEMENT	\$0.00	1000 GAL	N/A	\$ -
DEBT-WWTP (20 YEARS-4%)	\$0.074	WWTP COST	621,832.00	\$ 46,014
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	\$0.058	C.S. COST	622,218.00	\$ 364,367
TOTAL ANNUAL O&M				\$ 958,998
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	20		\$ 10,160,000
PRESENT WORTH OF CAPITAL				\$ 6,904,000
TOTAL 20-YEAR PRESENT WORTH				\$ 17,064,000

**Property Owner will be responsible for cost to connect structure to new sewer
40% contingency is used to account for current variability in pipe and fuel costs
Salvage value is excluded from present worth analysis
Collector sewers cost are excluded from this analysis since they are common to all alternatives
All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Mill Creek Branch
Alternative	Etown Collection System
Design Year	2037
Design Population	2310
Design Industrial Acres	0

Impact to Existing Utility: Existing Collection System \$1,500 per customer
Existing WWTP \$500 per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	6020	\$ 331,100
10-INCH	\$60.00	PER LF	7480	\$ 448,800
12-INCH	\$65.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	54	\$ 135,000
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF		\$ -
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF	23800	\$ 1,078,200
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	150	\$ 197,500
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM		
PUMP STATION		GPM		
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
SUBTOTAL BASE COST				\$ 2,190,600
EASEMENTS	0.5%			\$ 10,953
RESTORATION (PAVEMENT AND DRIVEWAY)	1.0%			\$ 219,060
EROSION AND SEDIMENT CONTROL	1.5%			\$ 32,859
GENERAL CONDITIONS	1.8%			\$ 175,248
SUBTOTAL CONSTRUCTION COST				\$ 2,628,720
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,051,488
IMPACT TO EXISTING UTILITY				
COLLECTION SYSTEM CAPACITY FEE	\$ 1,500.00	PER CUSTOMER	770	\$ 1,155,000
WWTP CAPACITY FEE	\$ 500.00	PER CUSTOMER	770	\$ 385,000
TOTAL CAPITAL COST OPINION**				\$ 5,220,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$33.50	1000 GAL	6843	\$ 228,455
PUMPING STATIONS	\$60.00	GPM	650	\$ 39,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	37798	\$ 3,746
ADMINISTRATION	\$0.25	1000 GAL	8715	\$ 21,079
REPLACEMENT	\$0.25	1000 GAL		
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST		
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	5220000	\$ 302,760
TOTAL ANNUAL O&M				\$ 649,040
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	20		\$ 6,876,000
PRESENT WORTH OF CAPITAL				\$ 5,220,000
TOTAL 20-YEAR PRESENT WORTH				\$ 12,096,000

**Property Owner will be responsible for cost to connect structure to new sewer
40% contingency is used to account for current variability in pipe and fuel costs
Salvage value is excluded from present worth analysis
Collector sewers cost are excluded from this analysis since they are common to all alternatives
All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan
 Service Area: Mill Creek Branch
 Alternative: New North WWTP
 Design Year: 2017
 Design Population: 2810
 Design Industrial Acres: 0

Impact to Existing Utility: Not Applicable

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	5672	\$ 331,100
10-INCH	\$80.00	PER LF	5735	\$ 448,800
12-INCH	\$85.00	PER LF	0	\$ -
15-INCH	\$70.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
21-INCH	\$90.00	PER LF	0	\$ -
24-INCH	\$100.00	PER LF	0	\$ -
27-INCH	\$110.00	PER LF	0	\$ -
30-INCH	\$120.00	PER LF	0	\$ -
33-INCH	\$130.00	PER LF	0	\$ -
36-INCH	\$140.00	PER LF	0	\$ -
42-INCH	\$160.00	PER LF	0	\$ -
48-INCH	\$180.00	PER LF	0	\$ -
MANHOLES	\$2,500.00	EACH	54	\$ 135,000
FORCE MAIN				
4-INCH	\$30.00	PER LF	0	\$ -
6-INCH	\$35.00	PER LF	0	\$ -
8-INCH	\$40.00	PER LF	0	\$ -
10-INCH	\$45.00	PER LF	4930	\$ 2,249,100
12-INCH	\$50.00	PER LF	0	\$ -
14-INCH	\$60.00	PER LF	0	\$ -
16-INCH	\$70.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
24-INCH	\$90.00	PER LF	0	\$ -
PUMP STATION (IF <1500 GPM USE 150*GPM+100,000)		GPM	1500	\$ 197,500
PUMP STATION (IF >1500 GPM USE 215*GPM+550,000)		GPM	1500	\$ 197,500
PUMP STATION		GPM	0	\$ -
WASTEWATER TREATMENT PLANT	\$5.00	AVE GPD	231000	\$ 1,155,000
SUBTOTAL BASE COST				\$ 4,714,000
EASEMENTS	0.5%			\$ 23,570
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 471,400
EROSION AND SEDIMENT CONTROL	1.5%			\$ 70,710
GENERAL CONDITIONS	1.8%			\$ 377,120
SUBTOTAL CONSTRUCTION COST				\$ 5,656,800
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 2,262,720
TOTAL CAPITAL COST OPINION**				\$ 7,920,000
ANNUAL OPERATIONS & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$84.315	1000 GAL	1000	\$ 84,315
PUMPING STATIONS	\$78.000	GPM	1000	\$ 78,000
FORCE MAINS & INTERCEPTORS	\$6.348	PER LF	1000	\$ 6,348
ADMINISTRATION	\$42.158	1000 GAL	1000	\$ 42,158
REPLACEMENT	\$21.079	1000 GAL	1000	\$ 21,079
DEBT-WWTP (20 YEARS-4%)	\$143.598	WWTP COST	1	\$ 143,598
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	\$346.810	C.S. COST	1	\$ 346,810
TOTAL ANNUAL O&M				\$ 722,308
TOTAL PRESENT WORTH		ANNUAL INTEREST	NO. OF YEARS	
PRESENT WORTH OF O&M		7.00%	20	\$ 7,652,000
PRESENT WORTH OF CAPITAL				\$ 7,920,000
TOTAL 20-YEAR PRESENT WORTH				\$ 15,572,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan	
Service Area	Mill Creek Branch
Alternative	Radcliff WWTP
Design Year	2017
Design Population	2310
Design Industrial Acres	0

Impact to Existing Utility: New force main proposed to be tied into new headworks
New headworks
\$1000 Connection Charge per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	6,020	\$ 331,100
10-INCH	\$60.00	PER LF	7,480	\$ 448,800
12-INCH	\$65.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	54	\$ 135,000
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF		\$ -
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF	6,940	\$ 1,662,300
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$80.00	PER LF		\$ -
PUMP STATION (IF <1500 GPM USE 150*GPM+100,000)				
PUMP STATION		GPM	650	\$ 197,500
PUMP STATION (IF >1500 GPM USE 215*GPM+550,000)				
PUMP STATION		GPM		\$ -
PUMP STATION				
	See Function	GPM		\$ -
WASTEWATER TREATMENT PLANT				
	\$4.00	AVE GPD		\$ -
NEW HEADWORKS				
	\$1.00	AVE GPD	231,000	\$ 231,000
SUBTOTAL BASE COST				\$ 3,005,700
EASEMENTS				
	0.5%			\$ 15,029
RESTORATION (PAVEMENT AND DRIVEWAY)				
	10%			\$ 300,570
EROSION AND SEDIMENT CONTROL				
	1.5%			\$ 45,086
GENERAL CONDITIONS				
	8%			\$ 240,456
SUBTOTAL CONSTRUCTION COST				\$ 3,606,840
CONTINGENCY AND TECHNICAL SERVICE				
	40%			\$ 1,442,736
IMPACT TO EXISTING UTILITY				
CONNECTION CHARGE	\$ 1,000.00	PER CUSTOMER	770	\$ 770,000
TOTAL CAPITAL COST OPINION**				\$ 5,820,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS				
	\$4.10	1000 GAL	84,315	\$ 345,692
PUMPING STATIONS				
	\$80.00	GPM	650	\$ 39,000
FORCE MAINS & INTERCEPTORS				
	\$0.10	PER LF	50,440	\$ 5,044
ADMINISTRATION				
	\$0.25	1000 GAL	84,315	\$ 21,079
REPLACEMENT				
	\$0.25	1000 GAL		\$ -
DEBT-WWTP (20 YEARS-4%)				
	0.074	WWTP COST	247,290	\$ 33,099
DEBT-COLLECTION SYSTEM (30 YEARS-4%)				
	0.058	C.S. COST	5,872,740	\$ 311,617
TOTAL ANNUAL O&M				\$ 755,531
TOTAL PRESENT WORTH				
	ANNUAL INTEREST	NO. OF YEARS		
	7.00%	20		\$ 8,004,000
PRESENT WORTH OF O&M				\$ 8,004,000
PRESENT WORTH OF CAPITAL				\$ 5,820,000
TOTAL 20-YEAR PRESENT WORTH				\$ 13,824,000

**Property Owner will be responsible for cost to connect structure to new sewer
40% contingency is used to account for current variability in pipe and fuel costs
Salvage value is excluded from present worth analysis
Collector sewers cost are excluded from this analysis since they are common to all alternatives
All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area

Lawley Creek & Upper Otter Creek

Alternative

Vine Grove WWTP

Design Year

2017

Design Population

4710

Design Industrial Acres

0

Impact to Existing Utility: New force main proposed to be tied into existing WWTP
Expand Existing WWTP

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	17,580	\$ 966,900
10-INCH	\$60.00	PER LF	8,370	\$ 502,200
12-INCH	\$65.00	PER LF	2,030	\$ 261,950
15-INCH	\$70.00	PER LF	7,480	\$ 522,200
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	150	\$ 375,000
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF		\$ -
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF	21,230	\$ 977,850
12-INCH	\$60.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	1100	\$ 265,000
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM		\$ -
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO EXISTING COLLECTION SYSTEM				
EXPAND EXISTING WWTP	\$4.00	AVE GPD	471,000	\$ 1,884,000
SUBTOTAL BASE COST				\$ 5,755,100
EASEMENTS	0.5%			\$ 28,776
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 575,510
EROSION AND SEDIMENT CONTROL	1.6%			\$ 86,327
GENERAL CONDITIONS	8%			\$ 460,408
SUBTOTAL CONSTRUCTION COST				\$ 6,906,120
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 2,762,448
TOTAL CAPITAL COST OPINION**				\$ 9,669,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$8.00	1000 GAL	11,159	\$ 859,575
PUMPING STATIONS	\$60.00	GPM	1,100	\$ 66,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	58,170	\$ 5,917
ADMINISTRATION	\$0.25	1000 GAL	171,159	\$ 42,979
REPLACEMENT	\$0.00	1000 GAL	N/A	\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	3,585,261	\$ 234,229
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	6,505,739	\$ 377,217
TOTAL ANNUAL O&M				\$ 1,585,917
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	20	\$ 16,801,000
PRESENT WORTH OF CAPITAL				\$ 9,669,000
TOTAL 20-YEAR PRESENT WORTH				\$ 26,470,000

**Property Owner will be responsible for cost to connect structure to new sewer
40% contingency is used to account for current variability in pipe and fuel costs
Salvage value is excluded from present worth analysis
Collector sewers cost are excluded from this analysis since they are common to all alternatives
All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Pawley Creek & Upper Otter Creek
Alternative	Fort Knox WWTP
Design Year	2017
Design Population	4710
Design Industrial Acres	0

Impact to Existing Utility: Upgrade Existing Collection System

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	1600	\$ 966,800
10-INCH	\$60.00	PER LF	870	\$ 502,200
12-INCH	\$65.00	PER LF	400	\$ 261,850
15-INCH	\$70.00	PER LF	746	\$ 522,200
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$180.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	150	\$ 375,000
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF		\$ -
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF	3330	\$ 1,634,850
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	1000	\$ 265,000
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	1000	\$ 265,000
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO COLLECTION SYSTEM		LUMP SUM		\$ 90,000
SUBTOTAL BASE COST				\$ 4,883,100
EASEMENTS	0.5%			\$ 24,416
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 488,310
EROSION AND SEDIMENT CONTROL	1.5%			\$ 73,247
GENERAL CONDITIONS	8%			\$ 390,648
SUBTOTAL CONSTRUCTION COST				\$ 5,859,720
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 2,343,888
TOTAL CAPITAL COST OPINION**				\$ 8,204,000
ANNUAL OPERATIONS & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$2.00	1000 GAL	171915	\$ 343,830
PUMPING STATIONS	\$60.00	GPM	2000	\$ 132,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	73770	\$ 7,377
ADMINISTRATION	\$0.25	1000 GAL	171915	\$ 42,979
REPLACEMENT	\$0.00	1000 GAL		\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST		\$ -
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	8204000	\$ 475,832
TOTAL ANNUAL O&M				\$ 1,002,018
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	20	\$ 10,615,009
PRESENT WORTH OF CAPITAL				\$ 8,204,000
TOTAL 20-YEAR PRESENT WORTH				\$ 18,819,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan
 Service Area **Lawley Creek AND Upper Otter Creek**
 Alternative **New North WWTP**
 Design Year **2017**
 Design Population **4710**
 Design Industrial Acres **0.7**

Impact to Existing Utility: Not Applicable

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	1756	\$ 966,900
10-INCH	\$60.00	PER LF	853	\$ 502,200
12-INCH	\$65.00	PER LF	403	\$ 261,950
15-INCH	\$70.00	PER LF	746	\$ 522,200
18-INCH	\$80.00	PER LF	0	\$ -
21-INCH	\$90.00	PER LF	0	\$ -
24-INCH	\$100.00	PER LF	0	\$ -
27-INCH	\$110.00	PER LF	0	\$ -
30-INCH	\$120.00	PER LF	0	\$ -
33-INCH	\$130.00	PER LF	0	\$ -
36-INCH	\$140.00	PER LF	0	\$ -
42-INCH	\$160.00	PER LF	0	\$ -
48-INCH	\$180.00	PER LF	0	\$ -
MANHOLES	\$2,500.00	EACH	150	\$ 375,000
FORCE MAIN				
4-INCH	\$30.00	PER LF	0	\$ -
6-INCH	\$35.00	PER LF	0	\$ -
8-INCH	\$40.00	PER LF	0	\$ -
10-INCH	\$45.00	PER LF	1139	\$ 521,550
12-INCH	\$50.00	PER LF	0	\$ -
14-INCH	\$60.00	PER LF	0	\$ -
16-INCH	\$70.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
24-INCH	\$90.00	PER LF	0	\$ -
PUMP STATION (IF<1500 GPM USE 150'GPM+100,000)		GPM	1756	\$ 265,000
PUMP STATION (IF>1500 GPM USE 215'GPM+550,000)		GPM	0	\$ -
PUMP STATION		GPM	0	\$ -
WASTEWATER TREATMENT PLANT	\$6.00	AVE GPD	39250000	\$ 2,355,000
SUBTOTAL BASE COST				
				\$ 5,769,800
EASEMENTS				
				\$ 28,849
RESTORATION (PAVEMENT AND DRIVEWAY)				
				\$ 576,980
EROSION AND SEDIMENT CONTROL				
				\$ 86,547
GENERAL CONDITIONS				
				\$ 461,584
SUBTOTAL CONSTRUCTION COST				
				\$ 6,923,760
CONTINGENCY AND TECHNICAL SERVICE				
				\$ 2,769,504
TOTAL CAPITAL COST OPINION**				
				\$ 9,693,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$0.00	1000 GAL	1756	\$ 171,915
PUMPING STATIONS	\$60.00	GPM	1756	\$ 66,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	4903	\$ 4,903
ADMINISTRATION	\$0.50	1000 GAL	1756	\$ 85,958
REPLACEMENT	\$0.25	1000 GAL	1756	\$ 42,979
DEBT-WWTP (20 YEARS-4%)	\$0.074	WWTP COST	292766	\$ 292,766
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	\$0.058	C.S. COST	332729	\$ 332,729
TOTAL ANNUAL O&M				
				\$ 997,249
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	20		\$ 10,565,000
PRESENT WORTH OF CAPITAL				\$ 9,693,000
TOTAL 20-YEAR PRESENT WORTH				
				\$ 20,258,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Pawley Creek & Upper Otter Creek
Alternative	Radcliff WWTP
Design Year	2017
Design Population	4710
Design Industrial Acres	0

Impact to Existing Utility: New force main proposed to be tied into new headworks
 New headworks
 \$1000 Connection Charge per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	172680	\$ 966,900.00
10-INCH	\$60.00	PER LF	8370	\$ 502,200.00
12-INCH	\$65.00	PER LF	4030	\$ 261,950.00
15-INCH	\$70.00	PER LF	7440	\$ 522,200.00
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	150	\$ 375,000.00
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF		\$ -
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF	3670	\$ 1,818,500
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	1000	\$ 265,000
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	1000	\$ 265,000
PUMP STATION	\$0.40	GPM		\$ -
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
NEW HEADWORKS	\$1.00	AVE GPD	471000	\$ 471,000
SUBTOTAL BASE COST				\$ 5,447,750
EASEMENTS	0.6%			\$ 27,239
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 544,775
EROSION AND SEDIMENT CONTROL	1.5%			\$ 81,716
GENERAL CONDITIONS	8%			\$ 435,820
SUBTOTAL CONSTRUCTION COST				\$ 6,537,300
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 2,614,920
IMPACT TO EXISTING UTILITY				
CONNECTION CHARGE	\$1,000.00	PER CUSTOMER	1,570	\$ 1,570,000
TOTAL CAPITAL COST OPINION**				\$ 10,722,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$4.10	1000 GAL	17815	\$ 704,852
PUMPING STATIONS	\$60.00	GPM	2200	\$ 132,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	7381	\$ 7,381
ADMINISTRATION	\$0.25	1000 GAL	18157	\$ 42,979
REPLACEMENT	\$0.25	1000 GAL		\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	1000 GAL	927000	\$ 68,598
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	10722000	\$ 621,876
TOTAL ANNUAL O&M				\$ 1,577,685
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	20	\$ 16,714,000
PRESENT WORTH OF CAPITAL				\$ 10,722,000
TOTAL 20-YEAR PRESENT WORTH				\$ 27,436,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Brushy Fork Creek
Alternative	Vine Grove WWTP
Design Year	2027
Design Population	4270
Design Industrial Acres	0

Impact to Existing Utility: New force main proposed to be tied into existing WWTP
Expand Existing WWTP

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF		\$ -
10-INCH	\$60.00	PER LF		\$ -
12-INCH	\$65.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$140.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH		\$ -
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF		\$ -
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150°GPM+100,000)		GPM	250	\$ 137,500
PUMP STATION (IF>1500 GPM USE 215°GPM+550,000)		GPM		
PUMP STATION		GPM		
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO EXISTING COLLECTION SYSTEM				
EXPAND EXISTING WWTP	\$4.00	AVE GPD	113,000	\$ 452,000
SUBTOTAL BASE COST				\$ 589,500
EASEMENTS	0.5%			\$ 2,948
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 58,950
EROSION AND SEDIMENT CONTROL	1.5%			\$ 8,843
GENERAL CONDITIONS	8%			\$ 47,160
SUBTOTAL CONSTRUCTION COST				\$ 707,400
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 282,960
TOTAL CAPITAL COST OPINION***				\$ 990,360
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$5.00	1000 GAL	41,245	\$ 206,225
PUMPING STATIONS	\$60.00	GPM	250	\$ 15,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF		\$ -
ADMINISTRATION	\$0.25	1000 GAL	41,245	\$ 10,311
REPLACEMENT	\$0.00	1000 GAL		\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	759,082	\$ 56,172
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	230,918	\$ 13,393
TOTAL ANNUAL O&M				\$ 301,102
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 1,075,000
PRESENT WORTH OF CAPITAL				\$ 503,000
TOTAL 20-YEAR PRESENT WORTH				\$ 1,578,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Brushy Fork Creek
Alternative	Brushy Fork Creek WWTP
Design Year	2027
Design Population	4270
Design Industrial Acres	0

Impact to Existing Utility: Upgrade Existing Collection System

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF		\$ -
10-INCH	\$60.00	PER LF		\$ -
12-INCH	\$65.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$180.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH		\$ -
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF		\$ -
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$60.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF <1500 GPM USE 150'GPM+100,000)		GPM	250	\$ 137,500
PUMP STATION (IF >1500 GPM USE 215'GPM+550,000)		GPM		
PUMP STATION		GPM		
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO COLLECTION SYSTEM				
SUBTOTAL BASE COST				\$ 137,500
EASEMENTS	0.5%			\$ 688
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 13,750
EROSION AND SEDIMENT CONTROL	1.5%			\$ 2,063
GENERAL CONDITIONS	8%			\$ 11,000
SUBTOTAL CONSTRUCTION COST				\$ 165,000
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 66,000
TOTAL CAPITAL COST OPINION***				\$ 231,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$2.00	1000 GAL	41245	\$ 82,490
PUMPING STATIONS	\$80.00	GPM	250	\$ 15,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	0	\$ -
ADMINISTRATION	\$0.60	1000 GAL	341245	\$ 20,623
REPLACEMENT	\$0.00	1000 GAL	0	\$ -
DEBT- WWTP (20 YEARS-4%)	0.074	WWTP COST	NA	\$ -
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	231000	\$ 13,398
TOTAL ANNUAL O&M				\$ 131,511
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	30	\$ 470,000
PRESENT WORTH OF CAPITAL				\$ 117,000
TOTAL 20-YEAR PRESENT WORTH				\$ 587,000

**Property Owner will be responsible for cost to connect structure to new sewer

***Excludes the cost from Design Year 2015

40% contingency is used to account for current variability in pipe and fuel costs

Salvage value is excluded from present worth analysis

Collector sewers cost are excluded from this analysis since they are common to all alternatives

All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Property Fork Creek
Alternative	New Northern WWTP
Design Year	2027
Design Population	4270
Design Industrial Acres	160

Impact to Existing Utility: Not Applicable

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF		\$ -
10-INCH	\$60.00	PER LF		\$ -
12-INCH	\$65.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,600.00	EACH		\$ -
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF		\$ -
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150'GPM+100,000)		GPM	250	\$ 137,500
PUMP STATION (IF>1500 GPM USE 215'GPM+550,000)		GPM		
PUMP STATION		GPM		
WASTEWATER TREATMENT PLANT	\$2.50	AVE GPD	113,000	\$ 282,500
SUBTOTAL BASE COST				
				\$ 420,000
EASEMENTS	0.5%			\$ 2,100
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 42,000
EROSION AND SEDIMENT CONTROL	15%			\$ 6,300
GENERAL CONDITIONS	8%			\$ 33,600
SUBTOTAL CONSTRUCTION COST				
				\$ 504,000
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 201,600
TOTAL CAPITAL COST OPINION***				
				\$ 706,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$15.00	1000 GAL	2745	\$ 41,245
PUMPING STATIONS	\$60.00	GPM	250	\$ 15,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	0	\$ -
ADMINISTRATION	\$0.60	1000 GAL	34	\$ 20,623
REPLACEMENT	\$0.25	1000 GAL	41	\$ 10,311
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	472	\$ 35,140
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	227	\$ 13,406
TOTAL ANNUAL O&M				
				\$ 135,725
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	10		\$ 485,000
PRESENT WORTH OF CAPITAL				\$ 358,000
TOTAL 20-YEAR PRESENT WORTH				
				\$ 844,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Brushy Fork Creek
Alternative	Radcliff WWTP
Design Year	2027
Design Population	4270
Design Industrial Acres	30

Impact to Existing Utility: New force main proposed to be tied into new headworks
New headworks
\$1000 Connection Charge per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$ 65.00	PER LF		\$ -
10-INCH	\$ 60.00	PER LF		\$ -
12-INCH	\$ 65.00	PER LF		\$ -
15-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
21-INCH	\$ 90.00	PER LF		\$ -
24-INCH	\$ 100.00	PER LF		\$ -
27-INCH	\$ 110.00	PER LF		\$ -
30-INCH	\$ 120.00	PER LF		\$ -
33-INCH	\$ 130.00	PER LF		\$ -
36-INCH	\$ 140.00	PER LF		\$ -
42-INCH	\$ 160.00	PER LF		\$ -
48-INCH	\$ 180.00	PER LF		\$ -
MANHOLES	\$ 2,500.00	EACH		\$ -
FORCE MAIN				
4-INCH	\$ 30.00	PER LF		\$ -
6-INCH	\$ 35.00	PER LF		\$ -
8-INCH	\$ 40.00	PER LF		\$ -
10-INCH	\$ 45.00	PER LF		\$ -
12-INCH	\$ 50.00	PER LF		\$ -
14-INCH	\$ 60.00	PER LF		\$ -
16-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
24-INCH	\$ 90.00	PER LF		\$ -
PUMP STATION (IF <1500 GPM USE 150*GPM+100,000)		GPM	250	\$ 137,500
PUMP STATION (IF >1500 GPM USE 215*GPM+550,000)		PEAK GPD		
PUMP STATION		PEAK GPD		
WASTEWATER TREATMENT PLANT	\$ 4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
NEW HEADWORKS	\$ 1.00	AVE GPD	113,000	\$ 113,000
SUBTOTAL BASE COST				\$ 250,500
EASEMENTS	0.5%			\$ 1,253
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 25,050
EROSION AND SEDIMENT CONTROL	1.5%			\$ 3,758
GENERAL CONDITIONS	.8%			\$ 20,040
SUBTOTAL CONSTRUCTION COST				\$ 300,600
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 120,240
IMPACT TO EXISTING UTILITY				
CONNECTION CHARGE	\$ 1,000.00	PER CUSTOMER	377	\$ 377,000
TOTAL CAPITAL COST OPINION**				\$ 798,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$ 169.10	1000 GAL	1245	\$ 169,105
PUMPING STATIONS	\$ 80.00	GPM		\$ -
FORCE MAINS & INTERCEPTORS	\$ 0.10	PER LF		\$ -
ADMINISTRATION	\$ 0.50	1000 GAL	1245	\$ 20,623
REPLACEMENT	\$ 0.00	1000 GAL		\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST		\$ 28,638
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST		\$ 25,405
TOTAL ANNUAL O&M				\$ 241,771
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 883,000
PRESENT WORTH OF CAPITAL				\$ 406,000
TOTAL 20-YEAR PRESENT WORTH				\$ 1,289,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Apple Creek
Alternative	Vine Grove WWTP
Design Year	2027
Design Population	1060
Design Industrial Acres	0

Impact to Existing Utility: New force main proposed to be tied into existing WWTP
Expand Existing WWTP

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$ 55.00	PER LF	18,790	\$ 1,033,450
10-INCH	\$ 60.00	PER LF		\$ -
12-INCH	\$ 65.00	PER LF		\$ -
15-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
21-INCH	\$ 90.00	PER LF		\$ -
24-INCH	\$ 100.00	PER LF		\$ -
27-INCH	\$ 110.00	PER LF		\$ -
30-INCH	\$ 120.00	PER LF		\$ -
33-INCH	\$ 130.00	PER LF		\$ -
36-INCH	\$ 140.00	PER LF		\$ -
42-INCH	\$ 160.00	PER LF		\$ -
48-INCH	\$ 180.00	PER LF		\$ -
MANHOLES	\$ 2,500.00	EACH	75	\$ 187,500
FORCE MAIN				
4-INCH	\$ 30.00	PER LF		\$ -
6-INCH	\$ 35.00	PER LF	12,600	\$ 443,100
8-INCH	\$ 40.00	PER LF		\$ -
10-INCH	\$ 45.00	PER LF		\$ -
12-INCH	\$ 50.00	PER LF		\$ -
14-INCH	\$ 60.00	PER LF		\$ -
16-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
24-INCH	\$ 90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)				
		GPM	200	\$ 142,000
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)				
		GPM		
PUMP STATION				
		GPM		
WASTEWATER TREATMENT PLANT	\$ 4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO EXISTING COLLECTION SYSTEM				
EXPAND EXISTING WWTP	\$ 4.00	AVE GPD	108,000	\$ 424,000
SUBTOTAL BASE COST				\$ 2,230,050
EASEMENTS	0.5%			\$ 11,150
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 223,005
EROSION AND SEDIMENT CONTROL	1.5%			\$ 33,451
GENERAL CONDITIONS	8%			\$ 178,404
SUBTOTAL CONSTRUCTION COST				\$ 2,676,060
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,070,424
TOTAL CAPITAL COST OPINION**				\$ 3,746,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$ 5.00	1000 GAL	38,090	\$ 193,450
PUMPING STATIONS	\$ 60.00	GPM	280	\$ 16,800
FORCE MAINS & INTERCEPTORS	\$ 0.10	PER LF	31,450	\$ 3,145
ADMINISTRATION	\$ 0.25	1000 GAL	38,090	\$ 9,673
REPLACEMENT	\$ 0.00	1000 GAL	N/A	
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	722,222	\$ 52,705
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	3,033,772	\$ 175,959
TOTAL ANNUAL O&M				\$ 451,731
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 1,613,000
PRESENT WORTH OF CAPITAL				\$ 1,904,000
TOTAL 20-YEAR PRESENT WORTH				\$ 3,517,000

**Property Owner will be responsible for cost to connect structure to new sewer
40% contingency is used to account for current variability in pipe and fuel costs
Salvage value is excluded from present worth analysis
Collector sewers cost are excluded from this analysis since they are common to all alternatives
All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Flippin Creek
Alternative	New North WWTP
Design Year	2027
Design Population	1060
Design Industrial Acres	0

Impact to Existing Utility: Not Applicable

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	18790	\$ 1,033,450
10-INCH	\$60.00	PER LF		\$ -
12-INCH	\$65.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	75	\$ 187,500
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF	4700	\$ 164,500
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	280	\$ 142,000
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM		
PUMP STATION		GPM		
WASTEWATER TREATMENT PLANT	\$2.50	AVE GPD	106,000	\$ 265,000
SUBTOTAL BASE COST \$ 1,792,450				
EASEMENTS	0.5%			\$ 8,962
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 179,245
EROSION AND SEDIMENT CONTROL	1.5%			\$ 26,887
GENERAL CONDITIONS	8%			\$ 143,396
SUBTOTAL CONSTRUCTION COST \$ 2,150,940				
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 860,376
TOTAL CAPITAL COST OPINION** \$ 3,011,000				
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$100	1000 GAL	38690	\$ 38,690
PUMPING STATIONS	\$60.00	GPM	280	\$ 16,800
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	23490	\$ 2,349
ADMINISTRATION	\$0.50	1000 GAL	38690	\$ 19,345
REPLACEMENT	\$0.25	1000 GAL	38690	\$ 9,673
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	445153	\$ 32,941
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	2565847	\$ 148,819
TOTAL ANNUAL O&M \$ 268,617				
TOTAL PRESENT WORTH	ANNUAL INTEREST	NO. OF YEARS		
PRESENT WORTH OF O&M	7.00%	10		\$ 959,000
PRESENT WORTH OF CAPITAL				\$ 1,531,000
TOTAL 20-YEAR PRESENT WORTH \$ 2,490,000				

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Flippin Creek
Alternative	Radcliff WWTP
Design Year	2027
Design Population	1000
Design Industrial Acres	

Impact to Existing Utility: New force main proposed to be tied into new headworks
 New headworks
 \$1000 Connection Charge per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	18720	\$ 1,033,450
10-INCH	\$60.00	PER LF		\$ -
12-INCH	\$65.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	75	\$ 187,500
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF	3220	\$ 1,513,050
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	280	\$ 142,000
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	280	\$ 142,000
PUMP STATION		GPM		
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
NEW HEADWORKS	\$1.00	AVE GPD	106000	\$ 106,000
SUBTOTAL BASE COST				\$ 3,124,000
EASEMENTS	0.6%			\$ 15,620
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 312,400
EROSION AND SEDIMENT CONTROL	1.5%			\$ 46,860
GENERAL CONDITIONS	2%			\$ 249,920
SUBTOTAL CONSTRUCTION COST				\$ 3,748,800
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,499,520
IMPACT TO EXISTING UTILITY				
CONNECTION CHARGE	\$1,000.00	PER CUSTOMER	353	\$ 353,000
TOTAL CAPITAL COST OPINION**				\$ 5,601,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$30.00	1000 GAL	38090	\$ 158,620
PUMPING STATIONS	\$80.00	GPM	560	\$ 33,600
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	2020	\$ 6,202
ADMINISTRATION	\$0.25	1000 GAL	38090	\$ 9,673
REPLACEMENT	\$0.00	1000 GAL		\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	190047	\$ 14,063
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	410853	\$ 313,835
TOTAL ANNUAL O&M				\$ 536,022
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	10		\$ 1,914,000
PRESENT WORTH OF CAPITAL				\$ 2,847,000
TOTAL 20-YEAR PRESENT WORTH				\$ 4,761,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Fripp Creek
Alternative	Fork Creek WWTP
Design Year	2027
Design Population	1660
Design Industrial Acres	0

Impact to Existing Utility: Upgrade Existing Collection System

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	187,900	\$ 1,033,450
10-INCH	\$60.00	PER LF		\$ -
12-INCH	\$85.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	73	\$ 187,500
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF	2,000	\$ 164,500
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF <1500 GPM USE 150*GPM+100,000)		GPM	280	\$ 142,000
PUMP STATION (IF >1500 GPM USE 215*GPM+550,000)		GPM		
PUMP STATION		GPM		
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO EXISTING COLLECTION SYSTEM		LUMP SUM		\$ -
SUBTOTAL BASE COST				\$ 1,527,450
EASEMENTS	0.5%			\$ 7,637
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 152,745
EROSION AND SEDIMENT CONTROL	1.5%			\$ 22,912
GENERAL CONDITIONS	8%			\$ 122,196
SUBTOTAL CONSTRUCTION COST				\$ 1,832,940
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 733,176
TOTAL CAPITAL COST OPINION**				\$ 2,566,116
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$2.00	1000 GAL	38,890	\$ 77,380
PUMPING STATIONS	\$60.00	GPM	280	\$ 16,800
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	23,490	\$ 2,349
ADMINISTRATION	\$0.25	1000 GAL	38,890	\$ 9,673
REPLACEMENT	\$0.00	1000 GAL	N/A	\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	0	\$ -
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	2,566,116	\$ 148,828
TOTAL ANNUAL O&M				\$ 255,030
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 911,000
PRESENT WORTH OF CAPITAL				\$ 1,304,000
TOTAL 20-YEAR PRESENT WORTH				\$ 2,215,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan
Service Area
Alternative
Design Year
Design Population
Design Industrial Acres

Impact to Existing Utility: New force main proposed to be tied into existing WWTP
Expand Existing WWTP

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$ 65.00	PER LF	6000	\$ 389,895
10-INCH	\$ 60.00	PER LF	2400	\$ 194,400
12-INCH	\$ 85.00	PER LF		\$ -
15-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
21-INCH	\$ 90.00	PER LF		\$ -
24-INCH	\$ 100.00	PER LF		\$ -
27-INCH	\$ 110.00	PER LF		\$ -
30-INCH	\$ 120.00	PER LF		\$ -
33-INCH	\$ 130.00	PER LF		\$ -
36-INCH	\$ 140.00	PER LF		\$ -
42-INCH	\$ 160.00	PER LF		\$ -
48-INCH	\$ 180.00	PER LF		\$ -
MANHOLES	\$ 2,500.00	EACH	42	\$ 102,600
FORCE MAIN				
4-INCH	\$ 30.00	PER LF		\$ -
6-INCH	\$ 35.00	PER LF	6030	\$ 1,611,050
8-INCH	\$ 40.00	PER LF		\$ -
10-INCH	\$ 45.00	PER LF		\$ -
12-INCH	\$ 50.00	PER LF		\$ -
14-INCH	\$ 60.00	PER LF		\$ -
16-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
24-INCH	\$ 90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	250	\$ 167,500
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	100	\$ 285,000
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$ 4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO EXISTING COLLECTION SYSTEM				
EXPAND EXISTING WWTP	\$ 4.00	AVE GPD	37000	\$ 148,000
SUBTOTAL BASE COST				\$ 2,878,345
EASEMENTS	0.5%			\$ 14,392
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 287,835
EROSION AND SEDIMENT CONTROL	1.5%			\$ 43,175
GENERAL CONDITIONS	8%			\$ 230,288
SUBTOTAL CONSTRUCTION COST				\$ 3,454,014
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,381,606
TOTAL CAPITAL COST OPINION***				\$ 4,836,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$ 5.00	1000 GAL	13505	\$ 67,525
PUMPING STATIONS	\$ 60.00	GPM	1350	\$ 81,000
FORCE MAINS & INTERCEPTORS	\$ 0.10	PER LF	53822	\$ 5,382
ADMINISTRATION	\$ 0.25	1000 GAL	13505	\$ 3,376
REPLACEMENT	\$ 0.00	1000 GAL		\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	228980	\$ 18,401
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	3957340	\$ 286,068
TOTAL ANNUAL O&M				\$ 454,004
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 1,621,000
PRESENT WORTH OF CAPITAL				\$ 2,458,000
TOTAL 20-YEAR PRESENT WORTH				\$ 4,079,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area

Mill Creek Branch

Alternative

Fort Knox

Design Year

2027

Design Population

2880

Design Industrial Acres

0

Impact to Existing Utility: Upgrade Existing Collection System

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	7238	\$ 389,895
10-INCH	\$60.00	PER LF	3240	\$ 194,400
12-INCH	\$63.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	43	\$ 102,500
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF	41910	\$ 1,456,350
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	450	\$ 167,500
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	500	\$ 265,000
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO COLLECTION SYSTEM		LUMP SUM		\$ 185,000
SUBTOTAL BASE COST				\$ 2,760,645
EASEMENTS	0.5%			\$ 13,803
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 276,065
EROSION AND SEDIMENT CONTROL	1.5%			\$ 41,410
GENERAL CONDITIONS	8%			\$ 220,852
SUBTOTAL CONSTRUCTION COST				\$ 3,312,774
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,325,110
TOTAL CAPITAL COST OPINION***				\$ 4,638,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$2.00	1000 GAL	13505	\$ 27,010
PUMPING STATIONS	\$60.00	GPM	1500	\$ 93,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	51939	\$ 5,194
ADMINISTRATION	\$0.25	1000 GAL	13505	\$ 3,376
REPLACEMENT	\$0.25	1000 GAL		\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST		\$ -
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	638000	\$ 269,064
TOTAL ANNUAL O&M				\$ 397,584
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 1,420,000
PRESENT WORTH OF CAPITAL				\$ 2,358,000
TOTAL 20-YEAR PRESENT WORTH				\$ 3,778,000

**Property Owner will be responsible for cost to connect structure to new sewer

***Excludes the cost from Design Year 2015

40% contingency is used to account for current variability in pipe and fuel costs

Salvage value is excluded from present worth analysis

Collector sewers cost are excluded from this analysis since they are common to all alternatives

All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area

Mill Creek Branch

Alternative

New Northern WWTP

Design Year

2027

Design Population

2680

Design Industrial Acres

50

Impact to Existing Utility:

Not Applicable

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	7080	\$ 389,895
10-INCH	\$60.00	PER LF	3240	\$ 194,400
12-INCH	\$65.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$180.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	42	\$ 102,500
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF	7760	\$ 1,671,250
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	450	\$ 167,500
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	1100	\$ 265,000
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$2.50	AVE GPD	37000	\$ 92,500
SUBTOTAL BASE COST				
				\$ 2,883,045
EASEMENTS	0.6%			\$ 14,415
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 286,305
EROSION AND SEDIMENT CONTROL	1.5%			\$ 43,245
GENERAL CONDITIONS	8%			\$ 230,644
SUBTOTAL CONSTRUCTION COST				
				\$ 3,459,654
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,383,862
TOTAL CAPITAL COST OPINION**				
				\$ 4,844,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$100.00	1000 GAL	13505	\$ 13,505
PUMPING STATIONS	\$60.00	GPM	15500	\$ 93,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	58079	\$ 5,808
ADMINISTRATION	\$0.50	1000 GAL	13505	\$ 6,753
REPLACEMENT	\$0.25	1000 GAL	13505	\$ 3,376
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	15500	\$ 11,501
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	4888584	\$ 271,938
TOTAL ANNUAL O&M				
				\$ 405,880
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 1,449,000
PRESENT WORTH OF CAPITAL				\$ 2,462,000
TOTAL 20-YEAR PRESENT WORTH				
				\$ 3,911,000

**Property Owner will be responsible for cost to connect structure to new sewer

***Excludes the cost from Design Year 2015

40% contingency is used to account for current variability in pipe and fuel costs

Salvage value is excluded from present worth analysis

Collector sewers cost are excluded from this analysis since they are common to all alternatives

All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area

Alternative

Design Year

Design Population

Design Industrial Acres

Mill Creek Branch
Radcliff WWTP
2027
2680
0

Impact to Existing Utility: New force main proposed to be tied into new headworks
 New headworks
 \$1000 Connection Charge per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	7080	\$ 389,895
10-INCH	\$60.00	PER LF	3200	\$ 194,400
12-INCH	\$65.00	PER LF	0	\$ -
15-INCH	\$70.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
21-INCH	\$90.00	PER LF	0	\$ -
24-INCH	\$100.00	PER LF	0	\$ -
27-INCH	\$110.00	PER LF	0	\$ -
30-INCH	\$120.00	PER LF	0	\$ -
33-INCH	\$130.00	PER LF	0	\$ -
36-INCH	\$140.00	PER LF	0	\$ -
42-INCH	\$160.00	PER LF	0	\$ -
48-INCH	\$180.00	PER LF	0	\$ -
MANHOLES	\$2,500.00	EACH	42	\$ 102,500
FORCE MAIN				
4-INCH	\$30.00	PER LF	0	\$ -
6-INCH	\$35.00	PER LF	34920	\$ 1,262,800
8-INCH	\$40.00	PER LF	0	\$ -
10-INCH	\$45.00	PER LF	0	\$ -
12-INCH	\$50.00	PER LF	0	\$ -
14-INCH	\$60.00	PER LF	0	\$ -
16-INCH	\$70.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
24-INCH	\$90.00	PER LF	0	\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	950	\$ 167,500
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	0	\$ -
PUMP STATION		GPM	0	\$ -
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD	0	\$ -
IMPACT TO EXISTING UTILITY				
NEW HEADWORKS	\$2.00	AVE GPD	37000	\$ 74,000
SUBTOTAL BASE COST				\$ 2,191,095
EASEMENTS	0.5%			\$ 10,855
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 219,110
EROSION AND SEDIMENT CONTROL	1.5%			\$ 32,866
GENERAL CONDITIONS	8%			\$ 175,288
SUBTOTAL CONSTRUCTION COST				\$ 2,629,314
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,051,726
IMPACT TO EXISTING UTILITY				
CONNECTION CHARGE	\$1,000.00	PER CUSTOMER	123	\$ 123,000
TOTAL CAPITAL COST OPINION**				\$ 3,804,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$410.00	1000 GAL	135	\$ 55,371
PUMPING STATIONS	\$60.00	GPM	1550	\$ 93,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	46410	\$ 4,641
ADMINISTRATION	\$0.25	1000 GAL	135	\$ 3,378
REPLACEMENT	\$0.25	1000 GAL	135	\$ 3,378
DEBT-WWTP (20 YEARS-4%)	\$0.074	WWTP COST	129473	\$ 213,161
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	\$0.058	C.S. COST	407562	\$ 213,161
TOTAL ANNUAL O&M				\$ 153,011
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 546,000
PRESENT WORTH OF CAPITAL				\$ 1,934,000
TOTAL 20-YEAR PRESENT WORTH				\$ 2,480,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area

Mill Creek Branch

Alternative

EIown WWTP

Design Year

2027

Design Population

2690

Design Industrial Acres

0

Impact to Existing Utility: Existing Collection System \$1,500 per customer
Existing WWTP \$500 per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST	
GRAVITY INTERCEPTOR SEWER					
8-INCH	\$55.00	PER LF	708	\$ 389,885	
10-INCH	\$60.00	PER LF	240	\$ 194,400	
12-INCH	\$65.00	PER LF		\$ -	
15-INCH	\$70.00	PER LF		\$ -	
18-INCH	\$80.00	PER LF		\$ -	
21-INCH	\$90.00	PER LF		\$ -	
24-INCH	\$100.00	PER LF		\$ -	
27-INCH	\$110.00	PER LF		\$ -	
30-INCH	\$120.00	PER LF		\$ -	
33-INCH	\$130.00	PER LF		\$ -	
36-INCH	\$140.00	PER LF		\$ -	
42-INCH	\$160.00	PER LF		\$ -	
48-INCH	\$180.00	PER LF		\$ -	
MANHOLES	\$2,600.00	EACH	41	\$ 102,500	
FORCE MAIN					
4-INCH	\$30.00	PER LF		\$ -	
8-INCH	\$35.00	PER LF		\$ -	
8-INCH	\$40.00	PER LF		\$ -	
10-INCH	\$45.00	PER LF		\$ -	
12-INCH	\$50.00	PER LF		\$ -	
14-INCH	\$60.00	PER LF		\$ -	
18-INCH	\$70.00	PER LF		\$ -	
18-INCH	\$80.00	PER LF		\$ -	
24-INCH	\$90.00	PER LF		\$ -	
PUMP STATION (IF<1500 GPM USE 150'GPM+100,000)					
		GPM	150	\$ 167,500	
PUMP STATION (IF>1500 GPM USE 215'GPM+550,000)					
		GPM		\$ -	
PUMP STATION					
		GPM		\$ -	
WASTEWATER TREATMENT PLANT					
	\$4.00	AVE GPD		\$ -	
SUBTOTAL BASE COST					
				\$ 854,295	
EASEMENTS					
	0.5%			\$ 4,271	
RESTORATION (PAVEMENT AND DRIVEWAY)					
	10%			\$ 85,430	
EROSION AND SEDIMENT CONTROL					
	15%			\$ 12,814	
GENERAL CONDITIONS					
	8%			\$ 68,344	
SUBTOTAL CONSTRUCTION COST					
				\$ 1,025,154	
CONTINGENCY AND TECHNICAL SERVICE					
	40%			\$ 410,062	
IMPACT TO EXISTING UTILITY					
COLLECTION SYSTEM CAPACITY FEE		\$1,500.00	PER CUSTOMER	123	\$ 185,000
WWTP CAPACITY FEE		\$500.00	PER CUSTOMER	123	\$ 61,667
TOTAL CAPITAL COST OPINION***					
				\$ 1,682,000	
ANNUAL OPERATION& MAINTENANCE					
WASTEWATER TREATMENT PLANTS					
		1000 GAL	45	\$ 45,242	
PUMPING STATIONS					
	\$60.00	GPM	450	\$ 27,000	
FORCE MAINS & INTERCEPTORS					
	\$0.10	PER LF	1033	\$ 1,033	
ADMINISTRATION					
	\$0.25	1000 GAL	13505	\$ 3,378	
REPLACEMENT					
	\$0.25	1000 GAL			
DEBT-WWTP (20 YEARS-4%)					
	0.074	1000 GAL			
DEBT-COLLECTION SYSTEM (30 YEARS-4%)					
	0.058	C.S. COST	1682000	\$ 97,558	
TOTAL ANNUAL O&M					
				\$ 174,207	
TOTAL PRESENT WORTH					
PRESENT WORTH OF O&M		ANNUAL INTEREST	NO. OF YEARS		
	7.00%		10	\$ 622,000	
PRESENT WORTH OF CAPITAL				\$ 855,000	
TOTAL 20-YEAR PRESENT WORTH					
				\$ 1,477,000	

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan
 Service Area: Mill Creek
 Alternative: Etown WWTP
 Design Year: 2027
 Design Population: 1670
 Design Industrial Acres: 0

Impact to Existing Utility: Existing Collection System \$1,500 per customer
 Existing WWTP \$500 per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$ 55.00	PER LF	1230	\$ 617,650
10-INCH	\$ 80.00	PER LF		\$ -
12-INCH	\$ 65.00	PER LF	290	\$ 190,450
15-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
21-INCH	\$ 90.00	PER LF		\$ -
24-INCH	\$ 100.00	PER LF		\$ -
27-INCH	\$ 110.00	PER LF		\$ -
30-INCH	\$ 120.00	PER LF		\$ -
33-INCH	\$ 130.00	PER LF		\$ -
36-INCH	\$ 140.00	PER LF		\$ -
42-INCH	\$ 160.00	PER LF		\$ -
48-INCH	\$ 180.00	PER LF		\$ -
MANHOLES	\$ 2,500.00	EACH	57	\$ 142,500
FORCE MAIN				
4-INCH	\$ 30.00	PER LF		\$ -
6-INCH	\$ 35.00	PER LF	750	\$ 271,250
8-INCH	\$ 40.00	PER LF		\$ -
10-INCH	\$ 45.00	PER LF		\$ -
12-INCH	\$ 50.00	PER LF		\$ -
14-INCH	\$ 60.00	PER LF		\$ -
16-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
24-INCH	\$ 90.00	PER LF		\$ -
PUMP STATION (IF <1500 GPM USE 150*GPM+100,000)		GPM	450	\$ 167,500
PUMP STATION (IF >1500 GPM USE 215*GPM+550,000)		GPM		\$ 100,000
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$ 4.00	AVE GPD		\$ -
SUBTOTAL BASE COST				\$ 1,489,350
EASEMENTS	0.5%			\$ 7,447
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 148,935
EROSION AND SEDIMENT CONTROL	1.5%			\$ 22,340
GENERAL CONDITIONS	8%			\$ 119,148
SUBTOTAL CONSTRUCTION COST				\$ 1,787,220
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 714,888
IMPACT TO EXISTING UTILITY				
COLLECTION SYSTEM CAPACITY FEE	\$ 1,500.00	PER CUSTOMER	557	\$ 835,000
WWTP CAPACITY FEE	\$ 500.00	PER CUSTOMER	557	\$ 278,333
TOTAL CAPITAL COST OPINION***				\$ 3,615,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$ 3.95	1000 GAL	60,855	\$ 204,199
PUMPING STATIONS	\$ 80.00	GPM	450	\$ 27,000
FORCE MAINS & INTERCEPTORS	\$ 0.10	PER LF	2,910	\$ 2,191
ADMINISTRATION	\$ 0.25	1000 GAL	60,855	\$ 15,239
REPLACEMENT	\$ 0.25	1000 GAL	N/A	
DEBT-WWTP (20 YEARS-4%)	0.074	1000 GAL	N/A	
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	3,615,000	\$ 208,670
TOTAL ANNUAL O&M				\$ 468,299
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	10		\$ 1,636,000
PRESENT WORTH OF CAPITAL				\$ 1,838,000
TOTAL 20-YEAR PRESENT WORTH				\$ 3,474,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

HardIn County Regional Facilities Plan

Service Area

Mill Creek

Alternative

Radcliff WWTP

Design Year

2027

Design Population

1870

Design Industrial Acres

750

Impact to Existing Utility: New force main proposed to be tied into new headworks

New headworks

\$1000 Connection Charge per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$65.00	PER LF	11230	\$ 817,650
10-INCH	\$80.00	PER LF		\$ -
12-INCH	\$65.00	PER LF	2930	\$ 190,450
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	57	\$ 142,500
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF	26330	\$ 921,550
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$60.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF <1500 GPM USE 150*GPM+100,000)		GPM	1450	\$ 187,500
PUMP STATION (IF >1600 GPM USE 215*GPM+550,000)		GPM	1450	\$ 187,500
PUMP STATION		GPM		
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
NEW HEADWORKS	\$2.00	AVE GPD	167,000	\$ 334,000
SUBTOTAL BASE COST				\$ 2,611,150
EASEMENTS	7.0%			\$ 13,056
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 261,115
EROSION AND SEDIMENT CONTROL	1.5%			\$ 39,167
GENERAL CONDITIONS	8%			\$ 208,982
SUBTOTAL CONSTRUCTION COST				\$ 3,133,380
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,253,352
IMPACT TO EXISTING UTILITY				
CONNECTION CHARGE	\$1,000.00	PER CUSTOMER	557	\$ 557,000
TOTAL CAPITAL COST OPINION**				\$ 4,944,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$240.00	1000 GAL	900	\$ 248,918
PUMPING STATIONS	\$60.00	GPM	1000	\$ 64,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	42490	\$ 4,249
ADMINISTRATION	\$0.25	1000 GAL	600	\$ 15,239
REPLACEMENT	\$0.25	1000 GAL	600	\$ 15,239
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	332022	
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	431680	\$ 250,073
TOTAL ANNUAL O&M				\$ 308,165
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 1,100,000
PRESENT WORTH OF CAPITAL				\$ 2,513,000
TOTAL 20-YEAR PRESENT WORTH				\$ 3,613,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 10% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan
 Service Area: Mill Creek
 Alternative: New North WWTP
 Design Year: 2027
 Design Population: 1670
 Design Industrial Acres: 0.8

Impact to Existing Utility: Not Applicable

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	1230	\$ 617,650
10-INCH	\$60.00	PER LF	-	\$ -
12-INCH	\$265.00	PER LF	1030	\$ 190,450
15-INCH	\$70.00	PER LF	-	\$ -
18-INCH	\$80.00	PER LF	-	\$ -
21-INCH	\$90.00	PER LF	-	\$ -
24-INCH	\$100.00	PER LF	-	\$ -
27-INCH	\$110.00	PER LF	-	\$ -
30-INCH	\$120.00	PER LF	-	\$ -
33-INCH	\$130.00	PER LF	-	\$ -
36-INCH	\$140.00	PER LF	-	\$ -
42-INCH	\$180.00	PER LF	-	\$ -
48-INCH	\$180.00	PER LF	-	\$ -
MANHOLES	\$2500.00	EACH	57	\$ 142,500
FORCE MAIN				
4-INCH	\$30.00	PER LF	-	\$ -
6-INCH	\$35.00	PER LF	10000	\$ 1,400,000
8-INCH	\$40.00	PER LF	-	\$ -
10-INCH	\$45.00	PER LF	-	\$ -
12-INCH	\$50.00	PER LF	-	\$ -
14-INCH	\$60.00	PER LF	-	\$ -
16-INCH	\$70.00	PER LF	-	\$ -
18-INCH	\$80.00	PER LF	-	\$ -
24-INCH	\$90.00	PER LF	-	\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	250	\$ 167,500
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	250	\$ 167,500
PUMP STATION		GPM	250	\$ 100,000
WASTEWATER TREATMENT PLANT	\$2.50	AVE GPD	167000	\$ 417,500
SUBTOTAL BASE COST				\$ 3,203,100
EASEMENTS	0.5%			\$ 16,016
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 320,310
EROSION AND SEDIMENT CONTROL	1.5%			\$ 48,047
GENERAL CONDITIONS	.8%			\$ 256,248
SUBTOTAL CONSTRUCTION COST				\$ 3,843,720
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,537,488
TOTAL CAPITAL COST OPINION***				\$ 5,381,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$1.00	1000 GAL	60955	\$ 60,955
PUMPING STATIONS	\$60.00	GPM	900	\$ 54,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	54160	\$ 5,416
ADMINISTRATION	\$0.50	1000 GAL	60955	\$ 30,478
REPLACEMENT	\$0.25	1000 GAL	60955	\$ 15,239
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	70133	\$ 51,902
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	378822	\$ 271,418
TOTAL ANNUAL O&M				\$ 489,407
TOTAL PRESENT WORTH				
ANNUAL INTEREST		ND. OF YEARS		
PRESENT WORTH OF O&M	7.00%	10		\$ 1,747,000
PRESENT WORTH OF CAPITAL				\$ 2,735,000
TOTAL 20-YEAR PRESENT WORTH				\$ 4,482,000

**Property Owner will be responsible for cost to connect structure to new sewer

***Excludes the cost from Design Year 2015

40% contingency is used to account for current variability in pipe and fuel costs

Salvage value is excluded from present worth analysis

Collector sewers cost are excluded from this analysis since they are common to all alternatives

All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area

Mill Creek

Alternative

Fort Knox

Design Year

2027

Design Population

1570

Design Industrial Acres

0.0

Impact to Existing Utility: Upgrade Existing Collection System

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	11230	\$ 617,650
10-INCH	\$60.00	PER LF		\$ -
12-INCH	\$65.00	PER LF		\$ 180,450
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	57	\$ 142,500
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF		\$ 1,185,100
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150'GPM+100,000)		GPM	1500	\$ 167,500
PUMP STATION (IF>1500 GPM USE 215'GPM+550,000)		GPM	1500	\$ 167,500
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO COLLECTION SYSTEM		LUMP SUM		\$ 185,000
SUBTOTAL BASE COST				\$ 2,655,700
EASEMENTS	0.5%			\$ 13,278
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 265,570
EROSION AND SEDIMENT CONTROL	15%			\$ 39,836
GENERAL CONDITIONS	18%			\$ 212,456
SUBTOTAL CONSTRUCTION COST				\$ 3,186,640
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,274,738
TOTAL CAPITAL COST OPINION**				\$ 4,462,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$2.00	1000 GAL	60,855	\$ 121,910
PUMPING STATIONS	\$60.00	GPM	900	\$ 54,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	48,020	\$ 4,802
ADMINISTRATION	\$0.25	1000 GAL	60,855	\$ 15,239
REPLACEMENT	\$0.25	1000 GAL	N/A	
DEBT-WWTP (20 YEARS-4%)	\$0.074	WWTP COST	N/A	
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	\$0.058	C.S. COST	462,000	\$ 258,796
TOTAL ANNUAL O&M				\$ 454,747
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 1,624,000
PRESENT WORTH OF CAPITAL				\$ 2,268,000
TOTAL 20-YEAR PRESENT WORTH				\$ 3,892,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area

Mill Creek

Alternative

Vine Grove WWTP

Design Year

2027

Design Population

1670

Design Industrial Acres

0

Impact to Existing Utility: New force main proposed to be tied into existing WWTP
Expand Existing WWTP

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$ 55.00	PER LF	1230	\$ 617,650
10-INCH	\$ 60.00	PER LF		\$ -
12-INCH	\$ 65.00	PER LF	2930	\$ 190,450
15-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
21-INCH	\$ 90.00	PER LF		\$ -
24-INCH	\$ 100.00	PER LF		\$ -
27-INCH	\$ 110.00	PER LF		\$ -
30-INCH	\$ 120.00	PER LF		\$ -
33-INCH	\$ 130.00	PER LF		\$ -
36-INCH	\$ 140.00	PER LF		\$ -
42-INCH	\$ 160.00	PER LF		\$ -
48-INCH	\$ 180.00	PER LF		\$ -
MANHOLES	\$ 2,500.00	EACH	57	\$ 142,500
FORCE MAIN				
4-INCH	\$ 30.00	PER LF		\$ -
6-INCH	\$ 35.00	PER LF	38280	\$ 1,339,800
8-INCH	\$ 40.00	PER LF		\$ -
10-INCH	\$ 45.00	PER LF		\$ -
12-INCH	\$ 50.00	PER LF		\$ -
14-INCH	\$ 60.00	PER LF		\$ -
16-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
24-INCH	\$ 90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150'GPM*100,000)		GPM	450	\$ 167,500
PUMP STATION (IF>1500 GPM USE 215'GPM*550,000)		GPM	450	\$ 167,500
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$ 4.00	AVE GPD	7000	\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO EXISTING COLLECTION SYSTEM				
EXPAND EXISTING WWTP	\$ 4.00	AVE GPD	67000	\$ 668,000
SUBTOTAL BASE COST				\$ 3,293,400
EASEMENTS	0.5%			\$ 16,487
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 329,340
EROSION AND SEDIMENT CONTROL	1.5%			\$ 49,401
GENERAL CONDITIONS	8%			\$ 263,472
SUBTOTAL CONSTRUCTION COST				\$ 3,952,080
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,580,832
TOTAL CAPITAL COST OPINION***				\$ 5,533,000
ANNUAL OPERATION& MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$ 60.00	1000 GAL	9550	\$ 304,775
PUMPING STATIONS	\$ 60.00	GPM	900	\$ 54,000
FORCE MAINS & INTERCEPTORS	\$ 0.10	PER LF	5440	\$ 5,244
ADMINISTRATION	\$ 0.25	1000 GAL	9550	\$ 15,239
REPLACEMENT	\$ 0.00	1000 GAL	N/A	
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	22258	\$ 83,047
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	410742	\$ 255,823
TOTAL ANNUAL O&M				\$ 716,128
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 2,584,000
PRESENT WORTH OF CAPITAL				\$ 2,813,000
TOTAL 20-YEAR PRESENT WORTH				\$ 5,377,000

**Property Owner will be responsible for cost to connect structure to new sewer

***Excludes the cost from Design Year 2015

40% contingency is used to account for current variability in pipe and fuel costs

Salvage value is excluded from present worth analysis

Collector sewers cost are excluded from this analysis since they are common to all alternatives

All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan	
Service Area	Pawley Cr., Upper Pawley Cr., Upper Otter Cr. & Lower Otter Cr.
Alternative	Vine Grove WWTP
Design Year	2027
Design Population	8560
Design Industrial Acres	23.0

Impact to Existing Utility: New force main proposed to be tied into existing WWTP
Expand Existing WWTP

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$ 55.00	PER LF	16,500	\$ 917,850
10-INCH	\$ 60.00	PER LF	2,880	\$ 172,800
12-INCH	\$ 65.00	PER LF		\$ -
15-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF	8,270	\$ 661,600
21-INCH	\$ 90.00	PER LF	2,700	\$ 204,300
24-INCH	\$ 100.00	PER LF		\$ -
27-INCH	\$ 110.00	PER LF		\$ -
30-INCH	\$ 120.00	PER LF		\$ -
33-INCH	\$ 130.00	PER LF		\$ -
36-INCH	\$ 140.00	PER LF		\$ -
42-INCH	\$ 160.00	PER LF		\$ -
48-INCH	\$ 180.00	PER LF		\$ -
MANHOLES	\$ 2,500.00	EACH	120	\$ 300,000
FORCE MAIN				
4-INCH	\$ 30.00	PER LF		\$ -
6-INCH	\$ 35.00	PER LF	6,500	\$ 227,500
8-INCH	\$ 40.00	PER LF		\$ -
10-INCH	\$ 45.00	PER LF		\$ -
12-INCH	\$ 50.00	PER LF		\$ -
15-INCH	\$ 60.00	PER LF	13,900	\$ 839,400
16-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
24-INCH	\$ 90.00	PER LF		\$ -
PUMP STATION (IF <1500 GPM USE 150*GPM+100,000)		GPM	1,700	\$ 915,500
PUMP STATION (IF >1500 GPM USE 215*GPM+550,000)		GPM	1,500	\$ 167,500
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$ 4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO EXISTING COLLECTION SYSTEM				
EXPAND EXISTING WWTP	\$ 4.00	AVE GPD	485,000	\$ 1,940,000
SUBTOTAL BASE COST				\$ 6,346,550
EASEMENTS	0.6%			\$ 31,733
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 634,855
EROSION AND SEDIMENT CONTROL	1.5%			\$ 95,198
GENERAL CONDITIONS	8%			\$ 507,724
SUBTOTAL CONSTRUCTION COST				\$ 7,615,860
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 3,046,344
TOTAL CAPITAL COST OPINION***				\$ 10,662,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$ 5.00	1000 GAL	17,025	\$ 85,125
PUMPING STATIONS	\$ 60.00	GPM	2,150	\$ 129,000
FORCE MAINS & INTERCEPTORS	\$ 0.10	PER LF	50,800	\$ 5,080
ADMINISTRATION	\$ 0.25	1000 GAL	17,025	\$ 44,256
REPLACEMENT	\$ 0.00	1000 GAL		\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	2,613,811	\$ 241,176
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	7,902,862	\$ 429,366
TOTAL ANNUAL O&M				\$ 1,733,883
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 6,191,000
PRESENT WORTH OF CAPITAL				\$ 5,420,000
TOTAL 20-YEAR PRESENT WORTH				\$ 11,611,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2006 dollars

DESCRIPTION

Hardin County Regional Facilities Plan
 Service Area: **Pawley Cr. Upper, Pawley Cr. Upper, Otter Cr. & Lower, Otter Cr.**
 Alternative: **New Northern WWTP**
 Design Year: **2027**
 Design Population: **650**
 Design Industrial Acres: **50**

Impact to Existing Utility: **Not Applicable**

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$ 65.00	PER LF	1412	\$ 917,950
10-INCH	\$ 60.00	PER LF	2880	\$ 172,800
12-INCH	\$ 85.00	PER LF	0	\$ -
15-INCH	\$ 70.00	PER LF	0	\$ -
18-INCH	\$ 80.00	PER LF	8270	\$ 661,600
21-INCH	\$ 90.00	PER LF	2220	\$ 204,300
24-INCH	\$ 100.00	PER LF	0	\$ -
27-INCH	\$ 110.00	PER LF	0	\$ -
30-INCH	\$ 120.00	PER LF	0	\$ -
33-INCH	\$ 130.00	PER LF	0	\$ -
36-INCH	\$ 140.00	PER LF	0	\$ -
42-INCH	\$ 180.00	PER LF	0	\$ -
48-INCH	\$ 180.00	PER LF	0	\$ -
MANHOLES	\$ 2,500.00	EACH	120	\$ 300,000
FORCE MAIN				
4-INCH	\$ 30.00	PER LF	0	\$ -
6-INCH	\$ 35.00	PER LF	6350	\$ 222,500
8-INCH	\$ 40.00	PER LF	0	\$ -
10-INCH	\$ 45.00	PER LF	0	\$ -
12-INCH	\$ 50.00	PER LF	0	\$ -
14-INCH	\$ 60.00	PER LF	0	\$ -
16-INCH	\$ 70.00	PER LF	0	\$ -
18-INCH	\$ 80.00	PER LF	0	\$ -
24-INCH	\$ 90.00	PER LF	0	\$ -
PUMP STATION (IF <1500 GPM USE 150*GPM+100,000)		GPM	1500	\$ 167,500
PUMP STATION (IF >1500 GPM USE 215*GPM+550,000)		GPM	0	\$ -
PUMP STATION		GPM	0	\$ -
WASTEWATER TREATMENT PLANT	\$ 2.50	AVE GPD	485,000	\$ 1,212,500
SUBTOTAL BASE COST				\$ 3,864,150
EASEMENTS	0.6%			\$ 19,321
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 386,415
EROSION AND SEDIMENT CONTROL	1.5%			\$ 57,962
GENERAL CONDITIONS	8%			\$ 309,132
SUBTOTAL CONSTRUCTION COST				\$ 4,636,980
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,854,792
TOTAL CAPITAL COST OPINION***				\$ 6,492,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$ 100.00	1000 GAL	17025	\$ 17,025
PUMPING STATIONS	\$ 60.00	GPM	450	\$ 27,000
FORCE MAINS & INTERCEPTORS	\$ 0.10	PER LF	3610	\$ 3,610
ADMINISTRATION	\$ 0.50	1000 GAL	17025	\$ 8,513
REPLACEMENT	\$ 0.25	1000 GAL	17025	\$ 4,256
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	2037072	\$ 150,743
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	4854920	\$ 258,386
TOTAL ANNUAL O&M				\$ 749,534
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 2,876,000
PRESENT WORTH OF CAPITAL				\$ 3,300,000
WORTH FOLLOWING INITIAL CAPITAL EXPENSE				\$ 5,976,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area **Pawley Cr Upper Pawley Cr Upper Otter Cr & Lower Otter Cr**
 Alternative **Radcliff WWTP**
 Design Year **2027**
 Design Population **9560**
 Design Industrial Acres **0**

Impact to Existing Utility: New force main proposed to be tied into new headworks
 New headworks
 \$1000 Connection Charge per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	167,800	\$ 917,950.00
10-INCH	\$60.00	PER LF	2,800	\$ 172,800.00
12-INCH	\$65.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF	7,700	\$ 661,600.00
21-INCH	\$90.00	PER LF	2,700	\$ 244,300.00
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	120	\$ 300,000.00
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$85.00	PER LF	2,600	\$ 227,500
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
16-INCH	\$60.00	PER LF	36,300	\$ 2,311,800
18-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	1,700	\$ 915,500
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	450	\$ 167,500
INTERMEDIATE PUMP STATION		GPM	1,700	\$ 915,500
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
NEW HEADWORKS	\$1.00	AVE GPD	485,000	\$ 485,000
SUBTOTAL BASE COST				\$ 7,279,450
EASEMENTS	0.5%			\$ 38,397
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 727,945
EROSION AND SEDIMENT CONTROL	1.5%			\$ 109,192
GENERAL CONDITIONS	8%			\$ 582,356
SUBTOTAL CONSTRUCTION COST				\$ 8,735,340
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 3,494,136
IMPACT TO EXISTING UTILITY				
CONNECTION CHARGE	\$ 1,000.00	PER CUSTOMER	1,617	\$ 1,617,000
TOTAL CAPITAL COST OPINION**				\$ 13,846,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$0.00	1000 GAL	725,803	\$ 725,803
PUMPING STATIONS	\$60.00	GPM	3,150	\$ 231,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	7,514	\$ 7,514
ADMINISTRATION	\$0.25	1000 GAL	177,258	\$ 44,258
REPLACEMENT	\$0.00	1000 GAL	N/A	\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	88,265	\$ 88,265
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	749,563	\$ 749,563
TOTAL ANNUAL O&M				\$ 1,826,401
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 6,621,000
PRESENT WORTH OF CAPITAL				\$ 7,039,000
TOTAL 20-YEAR PRESENT WORTH				\$ 13,560,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan
 Service Area **Pawley Cr., Upper Pawley Cr., Upper Otter Cr., & Lower Otter Cr.**
 Alternative **Fort Knox WWTP**
 Design Year **2027**
 Design Population **9580**
 Design Industrial Acres **0**

Impact to Existing Utility: Upgrade Existing Collection System

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$ 55.00	PER LF	16,890	\$ 917,950.00
10-INCH	\$ 60.00	PER LF	2,880	\$ 172,800.00
12-INCH	\$ 65.00	PER LF		\$ -
15-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF	8,270	\$ 661,600.00
21-INCH	\$ 90.00	PER LF	2,270	\$ 204,300.00
24-INCH	\$ 100.00	PER LF		\$ -
27-INCH	\$ 110.00	PER LF		\$ -
30-INCH	\$ 120.00	PER LF		\$ -
33-INCH	\$ 130.00	PER LF		\$ -
36-INCH	\$ 140.00	PER LF		\$ -
42-INCH	\$ 160.00	PER LF		\$ -
48-INCH	\$ 180.00	PER LF		\$ -
MANHOLES	\$ 2,500.00	EACH	120	\$ 300,000.00
FORCE MAIN				
4-INCH	\$ 30.00	PER LF		\$ -
6-INCH	\$ 35.00	PER LF	6,500	\$ 227,500.00
8-INCH	\$ 40.00	PER LF		\$ -
10-INCH	\$ 45.00	PER LF		\$ -
12-INCH	\$ 50.00	PER LF		\$ -
15-INCH	\$ 60.00	PER LF	40,750	\$ 2,445,000.00
16-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
24-INCH	\$ 90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	1,700	\$ 915,500.00
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	2,500	\$ 167,500.00
INTERMEDIATE PUMP STATION	\$ 915,500.00	GPM	2,000	\$ 915,500.00
WASTEWATER TREATMENT PLANT	\$ 4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO COLLECTION SYSTEM		LUMP SUM		\$ -
SUBTOTAL BASE COST				\$ 6,927,650
EASEMENTS	0.5%			\$ 34,838
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 692,765
EROSION AND SEDIMENT CONTROL	1.5%			\$ 103,915
GENERAL CONDITIONS	8%			\$ 554,212
SUBTOTAL CONSTRUCTION COST				\$ 8,313,180
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 3,325,272
TOTAL CAPITAL COST OPINION***				\$ 11,638,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$ 2.00	1000 GAL	17,025	\$ 354,050
PUMPING STATIONS	\$ 60.00	GPM	3,500	\$ 231,000
FORCE MAINS & INTERCEPTORS	\$ 0.10	PER LF	7,336	\$ 7,336
ADMINISTRATION	\$ 0.25	1000 GAL	17,025	\$ 44,256
REPLACEMENT	\$ 0.00	1000 GAL		\$ -
DEBT-WWTP (20 YEARS-4%)	\$ 0.074	WWTP COST		\$ -
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	\$ 0.058	C.S. COST	11,638,000	\$ 675,004
TOTAL ANNUAL O&M				\$ 1,312,046
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 4,885,000
PRESENT WORTH OF CAPITAL				\$ 5,916,000
TOTAL 20-YEAR PRESENT WORTH				\$ 10,801,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area

North Upper Nolin River

Alternative

Pump to Elbow WWTP

Design Year

2017

Design Population

377

Design Industrial Acres

1628

Impact to Existing Utility: Existing Collection System
Existing WWTP

\$0 per customer
\$500 per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$ 65.00	PER LF		\$ -
10-INCH	\$ 80.00	PER LF	5980	\$ 477,600
12-INCH	\$ 65.00	PER LF		\$ -
15-INCH	\$ 70.00	PER LF	12050	\$ 843,500
18-INCH	\$ 80.00	PER LF		\$ -
21-INCH	\$ 90.00	PER LF		\$ -
24-INCH	\$ 100.00	PER LF		\$ -
27-INCH	\$ 110.00	PER LF		\$ -
30-INCH	\$ 120.00	PER LF		\$ -
33-INCH	\$ 130.00	PER LF		\$ -
36-INCH	\$ 140.00	PER LF		\$ -
42-INCH	\$ 160.00	PER LF		\$ -
48-INCH	\$ 180.00	PER LF		\$ -
MANHOLES	\$ 2,500.00	EACH	80	\$ 200,000
FORCE MAIN				
4-INCH	\$ 30.00	PER LF		\$ -
6-INCH	\$ 35.00	PER LF		\$ -
8-INCH	\$ 40.00	PER LF		\$ -
10-INCH	\$ 45.00	PER LF		\$ -
12-INCH	\$ 50.00	PER LF		\$ -
14-INCH	\$ 60.00	PER LF		\$ -
16-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF	2610	\$ 2,048,800
24-INCH	\$ 90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150'GPM+100,000)				
		GPM	4500	\$ 1,517,500
PUMP STATION (IF>1500 GPM USE 215'GPM+550,000)				
		GPM	1500	\$ 1,517,500
PUMP STATION				
		GPM		\$ -
WASTEWATER TREATMENT PLANT				
	\$ 4.00	AVE GPD		\$ -
SUBTOTAL BASE COST				\$ 6,604,900
EASEMENTS				\$ 33,025
RESTORATION (PAVEMENT AND DRIVEWAY)				\$ 660,490
EROSION AND SEDIMENT CONTROL				\$ 99,074
GENERAL CONDITIONS				\$ 528,392
SUBTOTAL CONSTRUCTION COST				\$ 7,925,880
CONTINGENCY AND TECHNICAL SERVICE				\$ 3,170,352
IMPACT TO EXISTING UTILITY				
COLLECTION SYSTEM CAPACITY FEE				\$ -
WWTP CAPACITY FEE				\$ 4,946,833
TOTAL CAPITAL COST OPINION**				\$ 16,043,000
ANNUAL OPERATION& MAINTENANCE				
WASTEWATER TREATMENT PLANTS				\$ 3,032,420
PUMPING STATIONS				\$ 540,000
FORCE MAINS & INTERCEPTORS				\$ 4,562
ADMINISTRATION				\$ 226,300
REPLACEMENT				\$ -
DEBT-WWTP (20 YEARS-4%)				\$ -
DEBT-COLLECTION SYSTEM (30 YEARS-4%)				\$ 930,494
TOTAL ANNUAL O&M				\$ 4,733,776
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M				\$ 50,150,000
PRESENT WORTH OF CAPITAL				\$ 16,043,000
TOTAL 20-YEAR PRESENT WORTH				\$ 66,193,000

**Property Owner will be responsible for cost to connect structure to new sewer
40% contingency is used to account for current variability in pipe and fuel costs
Salvage value is excluded from present worth analysis
Collector sewers cost are excluded from this analysis since they are common to all alternatives
All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan
 Service Area: North Upper Nolich River
 Alternative: Pump & New Southern WWTP
 Design Year: 2017
 Design Population: 377
 Design Industrial Acres: 1628

Impact to Existing Utility: Not Applicable

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF		\$ -
10-INCH	\$60.00	PER LF	7960	\$ 477,600
12-INCH	\$65.00	PER LF		\$ -
15-INCH	\$70.00	PER LF	12050	\$ 843,500
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$180.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	80	\$ 200,000
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF		\$ -
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF	29780	\$ 2,378,400
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)				
		GPM	4500	\$ 1,517,500
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)				
		GPM	4500	\$ 1,517,500
PUMP STATION				
		GPM		\$ -
WASTEWATER TREATMENT PLANT				
	\$4.00	AVE GPD	2380000	\$ 9,920,000
SUBTOTAL BASE COST				
				\$ 16,854,500
EASEMENTS				
	0.6%			\$ 84,273
RESTORATION (PAVEMENT AND DRIVEWAY)				
	1.0%			\$ 1,685,450
EROSION AND SEDIMENT CONTROL				
	1.5%			\$ 252,818
GENERAL CONDITIONS				
	8%			\$ 1,348,360
SUBTOTAL CONSTRUCTION COST				
				\$ 20,225,400
CONTINGENCY AND TECHNICAL SERVICE				
	40%			\$ 8,090,160
TOTAL CAPITAL COST OPINION**				
				\$ 28,316,000
ANNUAL OPERATION& MAINTENANCE				
WASTEWATER TREATMENT PLANTS				
	\$905,200	1000 GAL	905,200	\$ 905,200
PUMPING STATIONS				
	\$60.00	GPM	9000	\$ 540,000
FORCE MAINS & INTERCEPTORS				
	\$0.10	PER LF	49740	\$ 4,974
ADMINISTRATION				
	\$0.50	1000 GAL	905,200	\$ 452,600
REPLACEMENT				
	\$0.25	1000 GAL	905,200	\$ 226,300
DEBT-WWTP (20 YEARS-4%)				
	0.074	WWTP COST	16,854,500	\$ 1,233,274
DEBT-COLLECTION SYSTEM (30 YEARS-4%)				
	0.058	C.S. COST	11,850,000	\$ 675,708
TOTAL ANNUAL O&M				
				\$ 4,038,056
TOTAL PRESENT WORTH				
	ANNUAL INTEREST	NO. OF YEARS		
	7.00%	20		\$ 42,779,000
PRESENT WORTH OF CAPITAL				
				\$ 28,316,000
TOTAL 20-YEAR PRESENT WORTH				
				\$ 71,095,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Rocky Ridge
Alternative	Pump to Town WWTP
Design Year	2017
Design Population	2750
Design Industrial Acres	0

Impact to Existing Utility: Existing Collection System \$0 per customer
 Existing WWTP \$500 per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	2580	\$ 691,900.00
10-INCH	\$60.00	PER LF		\$ -
12-INCH	\$65.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	50	\$ 125,000.00
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF	12400	\$ 434,350
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$90.00	PER LF		\$ -
18-INCH	\$120.00	PER LF		\$ -
24-INCH	\$200.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	200	\$ 130,000
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM		\$ -
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
SUBTOTAL BASE COST				\$ 1,381,250
EASEMENTS	0.5%			\$ 6,906
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 138,125
EROSION AND SEDIMENT CONTROL	1.5%			\$ 20,719
GENERAL CONDITIONS	8%			\$ 110,500
SUBTOTAL CONSTRUCTION COST				\$ 1,657,500
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 663,000
IMPACT TO EXISTING UTILITY				
COLLECTION SYSTEM CAPACITY FEE		PER CUSTOMER	250	\$ -
WWTP CAPACITY FEE	\$500.00	PER CUSTOMER	250	\$ 125,000
TOTAL CAPITAL COST OPINION**				\$ 2,446,000
ANNUAL OPERATION& MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$9.37	1000 GAL	22375	\$ 91,706
PUMPING STATIONS	\$60.00	PEAK GPD	200	\$ 12,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	24890	\$ 2,489
ADMINISTRATION	\$0.25	1000 GAL	2750	\$ 6,844
REPLACEMENT	\$0.00	1000 GAL		\$ -
DEBT-WWTP (20 YEARS-4%)	\$0.074	WWTP COST		\$ -
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	\$0.058	C.S. COST	200000	\$ 141,868
TOTAL ANNUAL O&M				\$ 254,917
TOTAL PRESENT WORTH		ANNUAL INTEREST	NO. OF YEARS	
PRESENT WORTH OF O&M		7.00%	20	\$ 2,701,000
PRESENT WORTH OF CAPITAL				\$ 2,446,000
TOTAL 20-YEAR PRESENT WORTH				\$ 5,147,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Rose Run
Alternative	Pump to New Southern WWTP
Design Year	2017
Design Population	750
Design Industrial Acres	0

Impact to Existing Utility: Not Applicable

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$ 55.00	PER LF	12,580	\$ 691,900
10-INCH	\$ 60.00	PER LF		\$ -
12-INCH	\$ 85.00	PER LF		\$ -
15-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
21-INCH	\$ 90.00	PER LF		\$ -
24-INCH	\$ 100.00	PER LF		\$ -
27-INCH	\$ 110.00	PER LF		\$ -
30-INCH	\$ 120.00	PER LF		\$ -
33-INCH	\$ 130.00	PER LF		\$ -
36-INCH	\$ 140.00	PER LF		\$ -
42-INCH	\$ 150.00	PER LF		\$ -
48-INCH	\$ 180.00	PER LF		\$ -
MANHOLES	\$ 2,500.00	EACH	50	\$ 125,000
FORCE MAIN				
4-INCH	\$ 30.00	PER LF		\$ -
6-INCH	\$ 35.00	PER LF	22,350	\$ 782,250
8-INCH	\$ 40.00	PER LF		\$ -
10-INCH	\$ 45.00	PER LF		\$ -
12-INCH	\$ 50.00	PER LF		\$ -
14-INCH	\$ 60.00	PER LF		\$ -
16-INCH	\$ 90.00	PER LF		\$ -
18-INCH	\$ 120.00	PER LF		\$ -
24-INCH	\$ 200.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	200	\$ 130,000
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM		\$ -
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$ 4.00	AVE GPD	75,000	\$ 300,000
SUBTOTAL BASE COST				\$ 2,029,150
EASEMENTS	0.5%			\$ 10,146
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 202,915
EROSION AND SEDIMENT CONTROL	1.5%			\$ 30,437
GENERAL CONDITIONS	8%			\$ 162,332
SUBTOTAL CONSTRUCTION COST				\$ 2,434,980
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 973,992
TOTAL CAPITAL COST OPINION**				\$ 3,409,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$ 1.00	1000 GAL	27,375	\$ 27,375
PUMPING STATIONS	\$ 60.00	GPM	200	\$ 12,000
FORCE MAINS & INTERCEPTORS	\$ 0.10	PER LF	34,930	\$ 3,493
ADMINISTRATION	\$ 0.50	1000 GAL	27,375	\$ 13,688
REPLACEMENT	\$ 0.25	1000 GAL	27,375	\$ 6,844
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	500,000	\$ 37,298
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	2,804,996	\$ 168,490
TOTAL ANNUAL O&M				\$ 269,185
TOTAL PRESENT WORTH	ANNUAL INTEREST	NO. OF YEARS		
PRESENT WORTH OF O&M	7.00%	20		\$ 2,852,000
PRESENT WORTH OF CAPITAL				\$ 3,409,000
TOTAL 20-YEAR PRESENT WORTH				\$ 6,261,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area

N.U. Nolin River, U. Nolin River, Cox Run, Jackson Branch, Nolin River

Alternative Pump to New Southern WWTP

Design Year 2027

Equivalent Design Population 26490

Design Industrial Acres

Impact to Existing Utility: Not Applicable

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$ 58.00	PER LF	13210	\$ 781,550
10-INCH	\$ 60.00	PER LF	25800	\$ 1,534,800
12-INCH	\$ 65.00	PER LF	-	\$ -
15-INCH	\$ 70.00	PER LF	5700	\$ 399,700
18-INCH	\$ 80.00	PER LF	5900	\$ 448,400
21-INCH	\$ 90.00	PER LF	15900	\$ 1,439,100
24-INCH	\$ 100.00	PER LF	10570	\$ 1,057,000
27-INCH	\$ 110.00	PER LF	-	\$ -
30-INCH	\$ 120.00	PER LF	-	\$ -
33-INCH	\$ 130.00	PER LF	-	\$ -
36-INCH	\$ 140.00	PER LF	-	\$ -
42-INCH	\$ 160.00	PER LF	-	\$ -
48-INCH	\$ 180.00	PER LF	-	\$ -
MANHOLES	\$ 2,500.00	EACH	310	\$ 777,500
FORCE MAIN				
4-INCH	\$ 30.00	PER LF	-	\$ -
6-INCH	\$ 35.00	PER LF	-	\$ -
8-INCH	\$ 40.00	PER LF	-	\$ -
10-INCH	\$ 45.00	PER LF	-	\$ -
12-INCH	\$ 50.00	PER LF	-	\$ -
14-INCH	\$ 60.00	PER LF	-	\$ -
16-INCH	\$ 70.00	PER LF	-	\$ -
18-INCH	\$ 80.00	PER LF	-	\$ -
24-INCH	\$ 90.00	PER LF	-	\$ -
PUMP STATION (IF<1500 GPM USE 150'GPM+100,000)		GPM	100	\$ -
PUMP STATION (IF>1500 GPM USE 215'GPM+550,000)		GPM	-	\$ -
PUMP STATION		GPM	-	\$ -
WASTEWATER TREATMENT PLANT	\$ 2.50	AVE GPD	169,000	\$ 422,500
SUBTOTAL BASE COST				
				\$ 6,858,550
EASEMENTS	0.5%			\$ 34,293
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 685,855
EROSION AND SEDIMENT CONTROL	1.5%			\$ 102,878
GENERAL CONDITIONS	8%			\$ 548,684
SUBTOTAL CONSTRUCTION COST				
				\$ 8,230,260
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 3,292,104
TOTAL CAPITAL COST OPINION***				
				\$ 11,522,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$ 100.00	1000 GAL	61685	\$ 61,685
PUMPING STATIONS	\$ 60.00	GPM	100	\$ -
FORCE MAINS & INTERCEPTORS	\$ 0.10	PER LF	77640	\$ 7,764
ADMINISTRATION	\$ 0.60	1000 GAL	50843	\$ 30,843
REPLACEMENT	\$ 0.25	1000 GAL	61685	\$ 15,421
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	70975	\$ 52,624
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	1081222	\$ 627,109
TOTAL ANNUAL O&M				
				\$ 795,345
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	10		\$ 2,840,000
PRESENT WORTH OF CAPITAL				\$ 5,857,000
TOTAL 20-YEAR PRESENT WORTH				
				\$ 8,697,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015

40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	N.U. Nolin River, U. Nolin River, Cox Run, Jackson Branch, Nolin River
Alternative	Pump to E-Town WWTP
Design Year	2027
Equivalent Design Population	26400
Design Industrial Acres	0

Impact to Existing Utility: Existing Collection System \$0 per customer
 Existing WWTP \$500 per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$85.00	PER LF	84720	\$ 7,815,500.00
10-INCH	\$80.00	PER LF	25580	\$ 2,046,400.00
12-INCH	\$65.00	PER LF	0	\$ -
15-INCH	\$70.00	PER LF	5700	\$ 399,700.00
18-INCH	\$80.00	PER LF	5680	\$ 454,400.00
21-INCH	\$90.00	PER LF	15900	\$ 1,439,100.00
24-INCH	\$100.00	PER LF	10700	\$ 1,057,000.00
27-INCH	\$110.00	PER LF	0	\$ -
30-INCH	\$120.00	PER LF	0	\$ -
33-INCH	\$130.00	PER LF	0	\$ -
36-INCH	\$140.00	PER LF	0	\$ -
42-INCH	\$160.00	PER LF	0	\$ -
48-INCH	\$180.00	PER LF	0	\$ -
MANHOLES	\$2,500.00	EACH	310	\$ 777,500.00
FORCE MAIN				
4-INCH	\$30.00	PER LF	0	\$ -
6-INCH	\$35.00	PER LF	0	\$ -
8-INCH	\$40.00	PER LF	0	\$ -
10-INCH	\$45.00	PER LF	0	\$ -
12-INCH	\$50.00	PER LF	28300	\$ 1,431,500.00
14-INCH	\$60.00	PER LF	0	\$ -
16-INCH	\$70.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
24-INCH	\$90.00	PER LF	0	\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	1200	\$ 260,000
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	0	\$ -
PUMP STATION		GPM	0	\$ -
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD	0	\$ -
SUBTOTAL BASE COST				\$ 8,147,550
EASEMENTS	0.5%			\$ 40,738
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 814,755
EROSION AND SEDIMENT CONTROL	1.5%			\$ 122,213
GENERAL CONDITIONS	8%			\$ 651,804
SUBTOTAL CONSTRUCTION COST				\$ 9,777,060
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 3,910,824
IMPACT TO EXISTING UTILITY				
COLLECTION SYSTEM CAPACITY FEE	\$ -	PER CUSTOMER	563	\$ -
WWTP CAPACITY FEE	\$ 500.00	PER CUSTOMER	563	\$ 281,667
TOTAL CAPITAL COST OPINION***				\$ 13,970,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$135.00	1000 GAL	1685	\$ 226,875
PUMPING STATIONS	\$60.00	GPM	1200	\$ 72,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	106,270	\$ 10,627
ADMINISTRATION	\$0.25	1000 GAL	1685	\$ 421
REPLACEMENT	\$0.25	1000 GAL	N/A	
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	N/A	
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	13,970,000	\$ 810,260
TOTAL ANNUAL O&M				\$ 1,114,853
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	30	\$ 3,881,000
PRESENT WORTH OF CAPITAL				\$ 7,102,000
TOTAL 20-YEAR PRESENT WORTH				\$ 11,083,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Lower Valley Rose Run
Alternative	Pump to New Southern WWTP
Design Year	2027
Design Population	2260
Design Industrial Acres	0

Impact to Existing Utility: Not Applicable

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$65.00	PER LF	150	\$ 1,929,950
10-INCH	\$80.00	PER LF	350	\$ 279,000
12-INCH	\$85.00	PER LF	570	\$ 489,950
15-INCH	\$97.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
21-INCH	\$90.00	PER LF	0	\$ -
24-INCH	\$100.00	PER LF	0	\$ -
27-INCH	\$110.00	PER LF	0	\$ -
30-INCH	\$120.00	PER LF	0	\$ -
33-INCH	\$130.00	PER LF	0	\$ -
36-INCH	\$130.00	PER LF	0	\$ -
42-INCH	\$160.00	PER LF	0	\$ -
48-INCH	\$180.00	PER LF	0	\$ -
MANHOLES	\$2,600.00	EACH	183	\$ 470,000
FORCE MAIN				
4-INCH	\$30.00	PER LF	0	\$ -
6-INCH	\$35.00	PER LF	1600	\$ 558,950
8-INCH	\$40.00	PER LF	0	\$ -
10-INCH	\$45.00	PER LF	0	\$ -
12-INCH	\$50.00	PER LF	0	\$ -
14-INCH	\$60.00	PER LF	0	\$ -
16-INCH	\$70.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
24-INCH	\$90.00	PER LF	0	\$ -
PUMP STATION (IF <1500 GPM USE 150*GPM+100,000)		GPM	350	\$ 152,500
PUMP STATION (IF >1500 GPM USE 215*GPM+550,000)		GPM	0	\$ -
PUMP STATION		GPM	0	\$ -
WASTEWATER TREATMENT PLANT	\$ 2.50	AVE GPD	62,000	\$ 155,000
SUBTOTAL BASE COST				
				\$ 4,015,350
EASEMENTS	0.5%			\$ 20,077
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 401,535
EROSION AND SEDIMENT CONTROL	1.5%			\$ 60,230
GENERAL CONDITIONS	1.5%			\$ 321,228
SUBTOTAL CONSTRUCTION COST				\$ 4,818,420
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,927,368
TOTAL CAPITAL COST OPINION***				\$ 6,746,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$5.00	1000 GAL	22,630	\$ 22,630
PUMPING STATIONS	\$60.00	GPM	350	\$ 21,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	2,940	\$ 6,284
ADMINISTRATION	\$0.50	1000 GAL	22,630	\$ 11,315
REPLACEMENT	\$0.25	1000 GAL	22,630	\$ 5,658
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	280,000	\$ 19,270
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	305,682	\$ 376,164
TOTAL ANNUAL O&M				\$ 462,331
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 1,651,000
PRESENT WORTH OF CAPITAL				\$ 3,429,000
TOTAL 20-YEAR PRESENT WORTH				\$ 5,080,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan
 Service Area U. West Rhudes, W. Rhudes, Lower Valley, Rose Run
 Alternative Pump to E.Town Collection System
 Design Year 2027
 Design Population 2260
 Design Industrial Acres 0

Impact to Existing Utility: Existing Collection System \$0 per customer
 Existing WWTP \$500 per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	35,000	\$ 1,820,000.00
10-INCH	\$60.00	PER LF	4,700	\$ 279,000.00
12-INCH	\$75.00	PER LF	6,200	\$ 469,500.00
15-INCH	\$170.00	PER LF	0	\$ -
18-INCH	\$60.00	PER LF	0	\$ -
21-INCH	\$90.00	PER LF	0	\$ -
24-INCH	\$100.00	PER LF	0	\$ -
27-INCH	\$110.00	PER LF	0	\$ -
30-INCH	\$120.00	PER LF	0	\$ -
33-INCH	\$130.00	PER LF	0	\$ -
36-INCH	\$140.00	PER LF	0	\$ -
42-INCH	\$160.00	PER LF	0	\$ -
48-INCH	\$180.00	PER LF	0	\$ -
MANHOLES	\$2,500.00	EACH	188	\$ 470,000.00
FORCE MAIN				
4-INCH	\$30.00	PER LF	0	\$ -
6-INCH	\$35.00	PER LF	14,700	\$ 514,150
8-INCH	\$40.00	PER LF	0	\$ -
10-INCH	\$45.00	PER LF	0	\$ -
12-INCH	\$50.00	PER LF	0	\$ -
14-INCH	\$60.00	PER LF	0	\$ -
16-INCH	\$70.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
24-INCH	\$90.00	PER LF	0	\$ -
PUMP STATION (IF<1500 GPM USE 150'GPM+100,000)		GPM	350	\$ 152,500
PUMP STATION (IF>1500 GPM USE 215'GPM+650,000)		GPM	0	\$ -
PUMP STATION		GPM	0	\$ -
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD	0	\$ -
SUBTOTAL BASE COST				\$ 3,815,550
EASEMENTS	0.5%			\$ 19,078
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 381,655
EROSION AND SEDIMENT CONTROL	1.5%			\$ 57,233
GENERAL CONDITIONS	8%			\$ 305,244
SUBTOTAL CONSTRUCTION COST				\$ 4,578,660
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,831,464
IMPACT TO EXISTING UTILITY				\$ -
UPGRADE TO EXISTING COLLECTION SYSTEM	\$1,500.00	PER CUSTOMER	297	\$ 445,000
UPGRADE TO EXISTING WWTP	\$500.00	PER CUSTOMER	503	\$ 251,667
TOTAL CAPITAL COST OPINION***				\$ 7,107,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$53.35	1000 GAL	22,630	\$ 75,811
PUMPING STATIONS	\$60.00	GPM	350	\$ 21,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	6,200	\$ 6,166
ADMINISTRATION	\$0.25	1000 GAL	22,630	\$ 5,658
REPLACEMENT	\$0.25	1000 GAL	0	\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	0	\$ -
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	0	\$ -
TOTAL ANNUAL O&M				\$ 412,206
TOTAL ANNUAL O&M				\$ 520,840
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 1,860,000
PRESENT WORTH OF CAPITAL				\$ 3,613,000
TOTAL 20-YEAR PRESENT WORTH				\$ 5,473,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan
 Service Area: Upper Younger Creek
 Alternative: Pump to E Town Collection System
 Design Year: 2017
 Design Population: 1160
 Design Industrial Acres: 0

Impact to Existing Utility: Existing Collection System \$1,500 per customer
 Existing WWTP \$500 per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	1408	\$ 774,400
10-INCH	\$60.00	PER LF		\$ -
12-INCH	\$65.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	56	\$ 140,000
FORCE MAIN				
4-INCH	\$30.00	PER LF	3820	\$ 114,600
6-INCH	\$35.00	PER LF	36800	\$ 1,288,000
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	20	\$ 118,000
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	100	\$ 115,000
INTERMEDIATE		GPM	220	\$ 133,000
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
SUBTOTAL BASE COST				\$ 2,683,000
EASEMENTS	0.5%			\$ 13,415
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 268,300
EROSION AND SEDIMENT CONTROL	1.5%			\$ 40,245
GENERAL CONDITIONS	1.8%			\$ 214,640
SUBTOTAL CONSTRUCTION COST				\$ 3,219,600
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,287,840
IMPACT TO EXISTING UTILITY				
COLLECTION SYSTEM CAPACITY FEE	\$1,500.00	PER CUSTOMER	387	\$ 580,000
WWTP CAPACITY FEE	\$500.00	PER CUSTOMER	387	\$ 193,333
TOTAL CAPITAL COST OPINION**				\$ 5,281,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$365.00	1000 GAL	2310	\$ 141,839
PUMPING STATIONS	\$60.00	GPM	440	\$ 26,400
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	57000	\$ 5,470
ADMINISTRATION	\$0.25	1000 GAL	2310	\$ 10,585
REPLACEMENT	\$0.25	1000 GAL	NA	
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	NA	
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	281000	\$ 306,298
TOTAL ANNUAL O&M				\$ 490,592
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	20	\$ 5,197,000
PRESENT WORTH OF CAPITAL				\$ 5,281,000
TOTAL 20-YEAR PRESENT WORTH				\$ 10,478,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area: Upper Younger Creek
 Alternative: Pump to E-Town Collection System
 Design Year: 2027
 Design Population: 1580
 Design Industrial Acres: 0

Impact to Existing Utility: Existing Collection System \$1,500 per customer
 Existing WWTP \$500 per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$65.00	PER LF	5620	\$ 366,600
10-INCH	\$60.00	PER LF	3840	\$ 230,400
12-INCH	\$65.00	PER LF	0	\$ -
15-INCH	\$70.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
21-INCH	\$80.00	PER LF	0	\$ -
24-INCH	\$100.00	PER LF	0	\$ -
27-INCH	\$110.00	PER LF	0	\$ -
30-INCH	\$120.00	PER LF	0	\$ -
33-INCH	\$130.00	PER LF	0	\$ -
36-INCH	\$140.00	PER LF	0	\$ -
42-INCH	\$160.00	PER LF	0	\$ -
48-INCH	\$180.00	PER LF	0	\$ -
MANHOLES	\$2,500.00	EACH	43	\$ 107,500
FORCE MAIN				
4-INCH	\$30.00	PER LF	0	\$ -
6-INCH	\$35.00	PER LF	0	\$ -
8-INCH	\$40.00	PER LF	0	\$ -
10-INCH	\$49.00	PER LF	0	\$ -
12-INCH	\$60.00	PER LF	0	\$ -
14-INCH	\$60.00	PER LF	0	\$ -
16-INCH	\$70.00	PER LF	0	\$ -
18-INCH	\$80.00	PER LF	0	\$ -
24-INCH	\$90.00	PER LF	0	\$ -
PUMP STATION (IF <1500 GPM USE 150*GPM+100,000)		GPM	400	\$ 160,000
PUMP STATION (IF >1500 GPM USE 215*GPM+550,000)		GPM	400	\$ 160,000
PUMP STATION		GPM	0	\$ -
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD	0	\$ -
SUBTOTAL BASE COST				\$ 1,044,500
EASEMENTS	0.5%			\$ 5,223
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 104,450
EROSION AND SEDIMENT CONTROL	1.6%			\$ 16,668
GENERAL CONDITIONS	6%			\$ 83,560
SUBTOTAL CONSTRUCTION COST				\$ 1,253,400
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 501,360
IMPACT TO EXISTING UTILITY				
COLLECTION SYSTEM CAPACITY FEE	\$1,500.00	PER CUSTOMER	140	\$ 210,000
WWTP CAPACITY FEE	\$500.00	PER CUSTOMER	140	\$ 70,000
TOTAL CAPITAL COST OPINION***				\$ 2,035,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$335.00	1000 GAL	153	\$ 51,356
PUMPING STATIONS	\$60.00	GPM	800	\$ 48,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	1885	\$ 1,885
ADMINISTRATION	\$0.25	1000 GAL	1333	\$ 3,833
REPLACEMENT	\$0.25	1000 GAL	N/A	
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	N/A	
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	2035000	\$ 118,030
TOTAL ANNUAL O&M				\$ 222,304
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 794,000
PRESENT WORTH OF CAPITAL				\$ 1,034,000
TOTAL 20-YEAR PRESENT WORTH				\$ 1,828,000

**Property Owner will be responsible for cost to connect structure to new sewer
 ***Excludes the cost from Design Year 2015
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area

Cedar Creek

Alternative

Pump to E-Town Collection System

Design Year

2027

Design Population

500

Design Industrial Area

0

Impact to Existing Utility: Existing Collection System
Existing WWTP

\$1,500 per customer
\$500 per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	13,060	\$ 773,300
10-INCH	\$60.00	PER LF		\$ -
12-INCH	\$65.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	56	\$ 140,000
FORCE MAIN				
4-INCH	\$30.00	PER LF	19,210	\$ 576,300
6-INCH	\$35.00	PER LF		\$ -
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	140	\$ 121,000
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM		\$ -
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$4.00	AVE GPD		\$ -
SUBTOTAL BASE COST				\$ 1,610,600
EASEMENTS	0.5%			\$ 8,053
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 161,060
EROSION AND SEDIMENT CONTROL	1.5%			\$ 24,159
GENERAL CONDITIONS	8%			\$ 128,848
SUBTOTAL CONSTRUCTION COST				\$ 1,932,720
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 773,088
IMPACT TO EXISTING UTILITY				
COLLECTION SYSTEM CAPACITY FEE	\$1,500.00	PER CUSTOMER	167	\$ 250,000
WWTP CAPACITY FEE	\$500.00	PER CUSTOMER	167	\$ 83,333
TOTAL CAPITAL COST OPINION**				\$ 3,039,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$60.00	1000 GAL	1,025	\$ 61,138
PUMPING STATIONS	\$80.00	GPM	140	\$ 8,400
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	33,270	\$ 3,327
ADMINISTRATION	\$0.25	1000 GAL	1,025	\$ 4,563
REPLACEMENT	\$0.00	1000 GAL		\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST		
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	1,039,000	\$ 176,262
TOTAL ANNUAL O&M				\$ 253,689
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 906,000
PRESENT WORTH OF CAPITAL				\$ 1,545,000
TOTAL 20-YEAR PRESENT WORTH				\$ 2,451,000

**Property Owner will be responsible for cost to connect structure to new sewer
 10% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Cedar Creek
Alternative	Fort Knox WWTP
Design Year	2027
Design Population	500
Design Industrial Acres	0

Impact to Existing Utility: Upgrade Existing Collection System

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$ 255.00	PER LF	2910	\$ 773,300
10-INCH	\$ 60.00	PER LF		\$ -
12-INCH	\$ 65.00	PER LF		\$ -
15-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
21-INCH	\$ 90.00	PER LF		\$ -
24-INCH	\$ 100.00	PER LF		\$ -
27-INCH	\$ 110.00	PER LF		\$ -
30-INCH	\$ 120.00	PER LF		\$ -
33-INCH	\$ 130.00	PER LF		\$ -
36-INCH	\$ 140.00	PER LF		\$ -
42-INCH	\$ 160.00	PER LF		\$ -
48-INCH	\$ 180.00	PER LF		\$ -
MANHOLES	\$ 2,500.00	EACH	56	\$ 140,000
FORCE MAIN				
4-INCH	\$ 30.00	PER LF	47070	\$ 1,502,400
6-INCH	\$ 35.00	PER LF		\$ -
8-INCH	\$ 40.00	PER LF		\$ -
10-INCH	\$ 45.00	PER LF		\$ -
12-INCH	\$ 50.00	PER LF		\$ -
14-INCH	\$ 60.00	PER LF		\$ -
16-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
24-INCH	\$ 90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	240	\$ 121,000
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	240	\$ 121,000
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$ 4.00	AVE GPD		\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO COLLECTION SYSTEM		LUMP SUM		\$ 185,000
SUBTOTAL BASE COST				\$ 2,842,700
EASEMENTS	0.5%			\$ 14,214
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 284,270
EROSION AND SEDIMENT CONTROL	1.5%			\$ 42,641
GENERAL CONDITIONS	8%			\$ 227,416
SUBTOTAL CONSTRUCTION COST				\$ 3,411,240
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,364,496
TOTAL CAPITAL COST OPINION**				\$ 4,776,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$ 2.00	1000 GAL	18250	\$ 36,500
PUMPING STATIONS	\$ 60.00	GPM	280	\$ 16,800
FORCE MAINS & INTERCEPTORS	\$ 0.10	PER LF	64140	\$ 6,414
ADMINISTRATION	\$ 0.28	1000 GAL	18250	\$ 4,563
REPLACEMENT	\$ 0.00	1000 GAL		\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST		\$ -
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	776000	\$ 277,008
TOTAL ANNUAL O&M				\$ 341,285
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 1,219,000
PRESENT WORTH OF CAPITAL				\$ 2,428,000
TOTAL 20-YEAR PRESENT WORTH				\$ 3,647,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Clear Creek
Alternative	Pump to Existing Collection System
Design Year	2027
Design Population	1600
Design Industrial Acres	10

Impact to Existing Utility: Existing Collection System \$1,500 per customer
Existing WWTP \$500 per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	320	\$ 1,821,600
10-INCH	\$60.00	PER LF		\$ -
12-INCH	\$65.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	132	\$ 330,000
FORCE MAIN				
4-INCH	\$30.00	PER LF		\$ -
6-INCH	\$35.00	PER LF		\$ -
8-INCH	\$40.00	PER LF	1890	\$ 755,600
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
24-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	100	\$ 164,500
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM		\$ -
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$400	AVE GPD		\$ -
SUBTOTAL BASE COST				
				\$ 3,071,700
EASEMENTS	0.5%			\$ 15,359
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 307,170
EROSION AND SEDIMENT CONTROL	1.5%			\$ 46,076
GENERAL CONDITIONS	2%			\$ 245,736
SUBTOTAL CONSTRUCTION COST				
				\$ 3,686,040
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,474,416
IMPACT TO EXISTING UTILITY				
COLLECTION SYSTEM CAPACITY FEE	\$1,500.00	PER CUSTOMER	563	\$ 845,000
WWTP CAPACITY FEE	\$500.00	PER CUSTOMER	563	\$ 281,667
TOTAL CAPITAL COST OPINION**				
				\$ 6,287,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS		1000 GAL	2185	\$ 206,645
PUMPING STATIONS	\$60.00	GPM	430	\$ 25,800
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	5210	\$ 5,210
ADMINISTRATION	\$0.25	1000 GAL	6168	\$ 15,421
REPLACEMENT	\$0.00	1000 GAL	N/A	
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	N/A	
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	287000	\$ 364,648
TOTAL ANNUAL O&M				
				\$ 617,713
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	10	\$ 2,206,000
PRESENT WORTH OF CAPITAL				\$ 3,196,000
TOTAL 20-YEAR PRESENT WORTH				
				\$ 5,402,000

**Property Owner will be responsible for cost to connect structure to new sewer
40% contingency is used to account for current variability in pipe and fuel costs
Salvage value is excluded from present worth analysis
Collector sewers cost are excluded from this analysis since they are common to all alternatives
All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Upton & Sonoma Service Areas
Alternative	Pump to New Southern WWTP
Design Year	2017
Design Population	1,920
Design Industrial Acres	0

Impact to Existing Utility: Not Applicable

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	27,830	\$ 1,530,650
10-INCH	\$60.00	PER LF		\$ -
12-INCH	\$85.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$180.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	111	\$ 277,500
FORCE MAIN				
4-INCH	\$30.00	PER LF	24,290	\$ 728,900
6-INCH	\$35.00	PER LF	48,150	\$ 1,615,250
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
20-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150"GPM+100,000)		GPM	300	\$ 145,000
PUMP STATION (IF>1500 GPM USE 215"GPM+550,000)		GPM	100	\$ 115,000
INTERMEDIATE PUMP STATION		GPM	300	\$ 145,000
WASTEWATER TREATMENT PLANT	\$ 4.00	AVG GPD	92,000	\$ 368,000
SUBTOTAL BASE COST				\$ 4,923,300
EASEMENTS	0.5%			\$ 24,617
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 492,330
EROSION AND SEDIMENT CONTROL	1.5%			\$ 73,850
GENERAL CONDITIONS	8%			\$ 393,864
SUBTOTAL CONSTRUCTION COST				\$ 5,907,950
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 2,363,184
TOTAL CAPITAL COST OPINION**				\$ 8,271,009
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$100.00	1000 GAL	33,580	\$ 33,580
PUMPING STATIONS	\$60.00	GPM	700	\$ 42,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	98,210	\$ 9,821
ADMINISTRATION	\$0.50	1000 GAL	33,680	\$ 16,790
REPLACEMENT	\$0.25	1000 GAL	33,680	\$ 8,395
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	618,220	\$ 45,749
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	852,777	\$ 443,861
TOTAL ANNUAL O&M				\$ 600,196
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	20	\$ 6,358,000
PRESENT WORTH OF CAPITAL				\$ 8,271,000
TOTAL 20-YEAR PRESENT WORTH				\$ 14,629,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area	Upton & Sonora Service Area
Alternative	Pump to Cleveland WWTP
Design Year	2017
Design Population	920
Design Industrial Acres	0

Impact to Existing Utility: 180 GPM available capacity at Bonnleville Intermediate PS

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$ 55.00	PER LF	20,830	\$ 1,145,650
10-INCH	\$ 60.00	PER LF		\$ -
12-INCH	\$ 65.00	PER LF		\$ -
15-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
21-INCH	\$ 90.00	PER LF		\$ -
24-INCH	\$ 100.00	PER LF		\$ -
27-INCH	\$ 110.00	PER LF		\$ -
30-INCH	\$ 120.00	PER LF		\$ -
33-INCH	\$ 130.00	PER LF		\$ -
36-INCH	\$ 140.00	PER LF		\$ -
42-INCH	\$ 160.00	PER LF		\$ -
48-INCH	\$ 180.00	PER LF		\$ -
MANHOLES	\$ 2,500.00	EACH	108	\$ 207,500
FORCE MAIN				
4-INCH	\$ 30.00	PER LF	24,230	\$ 726,900
6-INCH	\$ 35.00	PER LF	33,700	\$ 1,179,500
8-INCH	\$ 40.00	PER LF		\$ -
10-INCH	\$ 45.00	PER LF		\$ -
12-INCH	\$ 50.00	PER LF		\$ -
14-INCH	\$ 60.00	PER LF		\$ -
16-INCH	\$ 70.00	PER LF		\$ -
18-INCH	\$ 80.00	PER LF		\$ -
20-INCH	\$ 90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150*GPM+100,000)		GPM	150	\$ 122,500
PUMP STATION (IF>1500 GPM USE 215*GPM+550,000)		GPM	180	\$ 127,000
PUMP STATION		GPM		\$ -
WASTEWATER TREATMENT PLANT	\$ 4.00	AVG GPD		\$ -
IMPACT TO EXISTING UTILITY				
UPGRADE TO EXISTING COLLECTION SYSTEM				
NEW EQUALIZATION BASIN AND ODOR CONTROL	\$ 2.00	AVE GPD	92,000	\$ 184,000
SUBTOTAL BASE COST				\$ 3,693,050
EASEMENTS	0.5%			\$ 18,465
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 369,305
EROSION AND SEDIMENT CONTROL	1.5%			\$ 55,396
GENERAL CONDITIONS	8%			\$ 295,444
SUBTOTAL CONSTRUCTION COST				\$ 4,431,660
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 1,772,664
TOTAL CAPITAL COST OPINION**				\$ 6,204,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$ 154.22	1000 GAL	335,580	\$ 152,453
PUMPING STATIONS	\$ 60.00	GPM	330	\$ 19,800
FORCE MAINS & INTERCEPTORS	\$ 0.10	PER LF	78,760	\$ 7,876
ADMINISTRATION	\$ 0.25	1000 GAL	33,580	\$ 8,395
REPLACEMENT	\$ 0.00	1000 GAL	N/A	\$ -
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	309,148	\$ 22,874
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	569,896	\$ 341,904
TOTAL ANNUAL O&M				\$ 553,302
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	20	\$ 5,882,000
PRESENT WORTH OF CAPITAL				\$ 6,204,000
TOTAL 20-YEAR PRESENT WORTH				\$ 12,066,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

DESCRIPTION

Hardin County Regional Facilities Plan

Service Area: Upton & Sorora Service Area
 Alternative: Part of E-Town Collection System
 Design Year: 2017
 Design Population: 920
 Design Industrial Acres: 100

Impact to Existing Utility: Existing Collection System \$0 per customer
 Existing WWTP \$500 per customer

ITEM	UNIT COST	UNITS	NUMBER OF UNITS	COST
GRAVITY INTERCEPTOR SEWER				
8-INCH	\$55.00	PER LF	26276.30	\$ 1,530,650
10-INCH	\$60.00	PER LF		\$ -
12-INCH	\$65.00	PER LF		\$ -
15-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
21-INCH	\$90.00	PER LF		\$ -
24-INCH	\$100.00	PER LF		\$ -
27-INCH	\$110.00	PER LF		\$ -
30-INCH	\$120.00	PER LF		\$ -
33-INCH	\$130.00	PER LF		\$ -
36-INCH	\$140.00	PER LF		\$ -
42-INCH	\$160.00	PER LF		\$ -
48-INCH	\$180.00	PER LF		\$ -
MANHOLES	\$2,500.00	EACH	111	\$ 277,500
FORCE MAIN				
4-INCH	\$30.00	PER LF	24230	\$ 726,900
6-INCH	\$35.00	PER LF	47810	\$ 1,649,900
8-INCH	\$40.00	PER LF		\$ -
10-INCH	\$45.00	PER LF		\$ -
12-INCH	\$50.00	PER LF		\$ -
14-INCH	\$60.00	PER LF		\$ -
16-INCH	\$70.00	PER LF		\$ -
18-INCH	\$80.00	PER LF		\$ -
20-INCH	\$90.00	PER LF		\$ -
PUMP STATION (IF<1500 GPM USE 150'GPM+100,000)		GPM	900	\$ 145,000
PUMP STATION (IF>1500 GPM USE 215'GPM+550,000)		GPM	1000	\$ 115,000
INTERMEDIATE PUMP STATION		GPM	300	\$ 145,000
WASTEWATER TREATMENT PLANT	\$4.00	AVG GPD		\$ -
SUBTOTAL BASE COST				
				\$ 4,589,950
EASEMENTS	0.5%			\$ 22,950
RESTORATION (PAVEMENT AND DRIVEWAY)	10%			\$ 458,995
EROSION AND SEDIMENT CONTROL	1.5%			\$ 68,849
GENERAL CONDITIONS	8%			\$ 367,196
SUBTOTAL CONSTRUCTION COST				
				\$ 5,507,940
CONTINGENCY AND TECHNICAL SERVICE	40%			\$ 2,203,176
IMPACT TO EXISTING UTILITY				
COLLECTION SYSTEM CAPACITY FEE		PER CUSTOMER	307	\$ -
WWTP CAPACITY FEE	\$500.00	PER CUSTOMER	307	\$ 153,333
TOTAL CAPITAL COST OPINION**				
				\$ 7,864,000
ANNUAL OPERATION & MAINTENANCE				
WASTEWATER TREATMENT PLANTS	\$39.50	1000 GAL	293500	\$ 112,493
PUMPING STATIONS	\$60.00	GPM	700	\$ 42,000
FORCE MAINS & INTERCEPTORS	\$0.10	PER LF	99200	\$ 9,920
ADMINISTRATION	\$0.25	1000 GAL	33500	\$ 8,395
REPLACEMENT	\$0.00	1000 GAL	N/A	
DEBT-WWTP (20 YEARS-4%)	0.074	WWTP COST	N/A	
DEBT-COLLECTION SYSTEM (30 YEARS-4%)	0.058	C.S. COST	7864000	\$ 456,112
TOTAL ANNUAL O&M				
				\$ 628,920
TOTAL PRESENT WORTH				
PRESENT WORTH OF O&M	7.00%	NO. OF YEARS	20	\$ 6,663,000
PRESENT WORTH OF CAPITAL				\$ 7,864,000
TOTAL 20-YEAR PRESENT WORTH				
				\$ 14,527,000

**Property Owner will be responsible for cost to connect structure to new sewer
 40% contingency is used to account for current variability in pipe and fuel costs
 Salvage value is excluded from present worth analysis
 Collector sewers cost are excluded from this analysis since they are common to all alternatives
 All costs in 3rd quarter 2007 dollars

INTRODUCTION

The economic analysis considers only the cost implications of each alternative. There are often nonmonetary factors that can influence the selection or rejection of a given alternative. This section explains how nonmonetary factors were considered and will illustrate the influence of these factors in tables for each alternative. The nonmonetary factors were developed by evaluating the alternatives for the full 20 year planning horizon.

EVALUATION OF NONMONETARY FACTORS

Nonmonetary factors are included for watersheds that have been accepted into the revised Elizabethtown Planning Area. These factors were developed initially and retained for verification of the watersheds' acceptance into the Elizabethtown Planning Area.

In general, the Eastern Service Area watersheds had two conveyance and treatment alternatives evaluated; one being conveyance and treatment at a new Younger Creek WWTP. After KDOW determined that no wasteload allocation would be permitted for this proposed WWTP, this alternative was eliminated from the evaluation in the Eastern Service Area watersheds.

The scoring criteria used in the evaluation of nonmonetary factors is as follows: a score of 1 implies the factor is favorable for the alternative, a score of 0 implies the factor is neutral for the alternative, and a score of -1 implies the factor is unfavorable for the alternative. The favorability of each alternative is based on the sum of the nonmonetary factors. The nonmonetary factors considered in this RWWFP are explained below.

A. Ability to Construct

The ability to construct infrastructure was considered for each alternative. This includes the proposed force mains, pump stations, and new wastewater treatment plants (if applicable). This factor examined location, land use, and population density.

B. Ability to Expand

The ability to expand the infrastructure for unexpected development was considered for each alternative. This factor examined the location and land use surrounding the proposed infrastructure.

C. Ability to Upgrade for Future Flow

The ability to upgrade the existing or proposed wastewater treatment plants was considered for each alternative. This factor examined the available capacity at the existing wastewater treatment plants as well as difficulty in upgrading the WWTPs.

D. Operation and Maintenance

The operation and maintenance of the proposed force mains, pump stations and WWTPs was considered for each alternative. This factor examined the length and location of the proposed force main and the capacity and location of the proposed pump station(s).

E. Anticipated Public Acceptance

The anticipated public acceptance for each alternative was considered. Typically, the public is more accepting of conveying wastewater to an existing facility than constructing a new facility.

F. Regional Solution

The potential for each alternative to represent a regional solution for wastewater conveyance and treatment needs was considered. The Kentucky Division of Water encourages regional facilities as solutions to wastewater conveyance and treatment demands. Regional facilities compete better for limited grant assistance.

G. Reliability

The reliability of the force main and pump station(s) proposed in each alternative was considered. Shorter force mains and smaller pump stations were considered more reliable than longer force mains with larger or multiple pump stations.

H. Odor Potential

The potential for odor creation was considered for each alternative. Alternatives with longer proposed force mains were considered to have more potential for odor creation because the wastewater is enclosed for a longer period of time therefore having a greater chance of anaerobic decomposition. This could cause more odors upon discharge.

I. Impact to Land

The impact to an area based on the location of the proposed infrastructure was considered for each alternative. This factor examined land use around the proposed infrastructure.

J. Impact on Future Development

The ability or inability to develop an area based on the proposed alignment of the infrastructure was considered for each alternative. This factor examined projected population and projected land use.

K. Impact to KPDES permit

The impact to the KPDES permits for the existing wastewater treatment plants was considered for each alternative. As the influent and effluent increases in a wastewater treatment plant, the concentration of various chemicals (e.g. nitrogen, phosphorus) is expected to decrease. This factor examined each wastewater treatment plants' available capacity as well as its success in meeting the current KPDES permit.

L. Impact to Receiving Stream

The impact to the receiving stream due to the increase in effluent was considered for each alternative. WWTPs discharging into larger streams will have less impact than WWTPs discharging into smaller streams. The average daily flow in the receiving streams for the existing and proposed WWTPs were examined to assess the impact on the stream.

M. Easement Acquisition

The ability to acquire easements necessary to develop the collection and conveyance infrastructure was considered for each alternative. This factor examined land use and population density to decide the difficulty or ease with which easements could possibly be obtained.

The following tables will illustrate the non-economic factor evaluation for each Watershed for the overall project planning horizon. The tables are grouped according to service area, with the Northern Service area Watersheds first, the Southern Area second, the Eastern Service area third, the Valley Creek Service area fourth, and the Upton and Sonora Service area fifth.

TABLE 1

NORTHERN SERVICE AREAS-UPPER SHAW CREEK NONMONETARY FACTORS

Factor	Alternative		
	Pump to Etown WWTP	Pump to Otter Creek WWTP	Pump to Radcliff WWTP
Ability to Construct	1	0	0
Ability to Expand	1	0	0
Ability to Upgrade for Future Flow	1	0	0
Operation and Maintenance	0	-1	-1
Anticipated Public Acceptance	1	0	1
Regional Solution	1	0	1
Reliability	1	-1	-1
Odor Potential	1	-1	-1
Impact to Land	1	-1	-1
Impact on Future Development	0	0	0
Impact to KPDES permit	-1	0	0
Impact to Receiving stream	0	0	0
Easement Acquisition	0	-1	-1
Total	7	-5	-3

The noneconomic factors indicate that conveying wastewater to the Elizabethtown WWTP may be the best alternative for the Upper Shaw Creek Watershed.

TABLE 2

NORTHERN SERVICE AREAS- PAWLEY CREEK AND OTTER CREEK NONMONETARY FACTORS

Factor	Alternative			
	Pump to Vine Grove WWTP	Gravity Collection to Otter Creek WWTP	Pump to Radcliff WWTP	Pump to Fort Knox WWTP
Ability to Construct	0	1	-1	-1
Ability to Expand	0	-1	0	1
Ability to Upgrade for Future Flow	-1	0	0	1
Operation and Maintenance	0	0	-1	-1
Anticipated Public Acceptance	1	-1	1	1
Regional Solution	1	-1	1	1
Reliability	1	1	0	0
Odor Potential	0	1	-1	-1
Impact to Land	0	0	0	0
Impact on Future Development	0	0	1	0
Impact to KPDES permit	-1	0	1	1
Impact to Receiving stream	0	0	0	-1
Easement Acquisition	-1	-1	-1	1
Total	0	-1	0	2

The noneconomic factors indicate that conveying wastewater to the Ft. Knox WWTP may be the best alternative for the Pawley Creek and Otter Creek Watersheds.

TABLE 3

NORTHERN SERVICE AREAS- BRUSHY FORK CREEK NONMONETARY FACTORS

Factor	Alternative			
	Pump to Vine Grove WWTP	Pump to Otter Creek WWTP	Pump to Radcliff WWTP	Pump to Fort Knox WWTP
Ability to Construct	0	0	0	0
Ability to Expand	0	0	0	0
Ability to Upgrade for Future Flow	-1	0	0	0
Operation and Maintenance	0	-1	0	-1
Anticipated Public Acceptance	1	0	1	1
Regional Solution	1	0	1	1
Reliability	0	0	0	0
Odor Potential	0	0	0	0
Impact to Land	-1	-1	-1	1
Impact on Future Development	0	0	0	1
Impact to KPDES permit	-1	0	1	1
Impact to Receiving stream	0	0	-1	-1
Easement Acquisition	0	0	-1	-1
Total	-1	-2	0	2

The noneconomic factors indicate that conveying wastewater to the Fort Knox WWTP may be the best alternative for the Brushy Fork Creek Watershed.

TABLE 4

NORTHERN SERVICE AREAS- MILL CREEK BRANCH NONMONETARY FACTORS

Factor	Alternative		
	Pump to E-Town WWTP	Pump to Otter Creek WWTP	Pump to Radcliff WWTP
Ability to Construct	1	-1	0
Ability to Expand	0	0	0
Ability to Upgrade for Future Flow	0	0	0
Operation and Maintenance	0	-1	-1
Anticipated Public Acceptance	1	0	1
Regional Solution	1	0	1
Reliability	0	-1	-1
Odor Potential	0	-1	-1
Impact to Land	0	-1	-1
Impact on Future Development	0	1	1
Impact to KPDES permit	-1	0	1
Impact to Receiving stream	0	0	-1
Easement Acquisition	-1	-1	0
Total	1	-5	-1

The noneconomic factors indicate that conveying wastewater to the Elizabethtown WWTP may be the best alternative for the Mill Creek Branch Watershed.

TABLE 5

NORTHERN SERVICE AREAS- MILL CREEK NONMONETARY FACTORS

Factor	Alternative				
	Pump to Vine Grove WWTP	Pump to Fort Knox WWTP	Pump to Otter Creek WWTP	Pump to Radcliff WWTP	Pump to E-Town WWTP
Ability to Construct	0	0	0	0	0
Ability to Expand	0	0	0	0	0
Ability to Upgrade for Future Flow	-1	1	0	1	0
Operation and Maintenance	-1	-1	-1	-1	-1
Anticipated Public Acceptance	1	1	0	1	1
Regional Solution	1	1	0	1	1
Reliability	-1	-1	-1	-1	1
Odor Potential	-1	-1	-1	-1	0
Impact to Land	-1	0	-1	-1	-1
Impact on Future Development	0	-1	0	0	0
Impact to KPDES permit	-1	1	0	0	-1
Impact to Receiving stream	0	-1	0	-1	0
Easement Acquisition	0	0	0	0	1
Total	-4	-1	-4	-2	1

The noneconomic factors indicate that conveying wastewater to the Fort Knox WWTP or the Elizabethtown WWTP may be the best alternative for the Mill Creek Watershed.

TABLE 6

NORTHERN SERVICE AREAS- FLIPPIN CREEK NONMONETARY FACTORS

Factor	Alternative		
	Pump to Vine Grove WWTP	Pump to Otter Creek WWTP	Pump to Radcliff WWTP
Ability to Construct	1	1	0
Ability to Expand	0	0	-1
Ability to Upgrade for Future Flow	-1	0	1
Operation and Maintenance	0	1	-1
Anticipated Public Acceptance	1	0	0
Regional Solution	1	0	1
Reliability	1	1	-1
Odor Potential	0	0	-1
Impact to Land	0	0	-1
Impact on Future Development	0	0	0
Impact to KPDES permit	-1	0	1
Impact to Receiving stream	0	0	0
Easement Acquisition	1	1	0
Total	3	4	-2

The noneconomic factors indicate that conveying wastewater to the Otter Creek WWTP may be the best alternative for the Flippin Creek Watershed.

TABLE 7

NORTHERN SERVICE AREAS-UPPER FREEMAN CREEK NONMONETARY FACTORS

Factor	Alternative	
	Pump to E-Town WWTP	Pump to Otter Creek WWTP
Ability to Construct	1	-1
Ability to Expand	1	0
Ability to Upgrade for Future Flow	0	0
Operation and Maintenance	1	-1
Anticipated Public Acceptance	1	0
Regional Solution	1	0
Reliability	1	-1
Odor Potential	1	-1
Impact to Land	0	-1
Impact on Future Development	0	1
Impact to KPDES permit	-1	0
Impact to Receiving stream	0	0
Easement Acquisition	0	-1
Total	6	-5

The noneconomic factors indicate that conveying wastewater to the Elizabethtown WWTP may be the best alternative for the Upper Freeman Creek Watershed.

TABLE 8

SOUTHERN SERVICE AREAS- MIDDLE CREEK BRANCH NONMONETARY FACTORS

Factor	Alternative	
	Pump to E-Town WWTP	Pump to Nolin River WWTP
Ability to Construct	1	0
Ability to Expand	0	0
Ability to Upgrade for Future Flow	0	0
Operation and Maintenance	-1	-1
Anticipated Public Acceptance	1	0
Regional Solution	1	0
Reliability	0	0
Odor Potential	-1	-1
Impact to Land	0	-1
Impact on Future Development	0	1
Impact to KPDES permit	-1	0
Impact to Receiving stream	0	1
Easement Acquisition	-1	-1
Total	-1	-2

The noneconomic factors indicate that conveying wastewater to the Elizabethtown WWTP may be the best alternative for the Middle Creek Branch Watershed.

TABLE 9

SOUTHERN SERVICE AREAS-ROSE RUN AND LOWER VALLEY CREEK NONMONETARY FACTORS

Factor	Alternative	
	Pump to E-Town WWTP	Pump to Nolin River WWTP
Ability to Construct	0	0
Ability to Expand	0	0
Ability to Upgrade for Future Flow	0	0
Operation and Maintenance	0	0
Anticipated Public Acceptance	1	0
Regional Solution	1	0
Reliability	1	1
Odor Potential	1	-1
Impact to Land	0	0
Impact on Future Development	0	1
Impact to KPDES permit	-1	0
Impact to Receiving stream	0	1
Easement Acquisition	0	0
Total	3	2

The noneconomic factors indicate that conveying wastewater to the Elizabethtown WWTP may be the best alternative for the Rose Run and Lower Valley Creek Watersheds.

TABLE 10

**SOUTHERN SERVICE AREAS-NOLIN RIVER, COX RUN, AND JACKSON BRANCH
NONMONETARY FACTORS**

Factor	Alternative	
	Pump to E-Town WWTP	Gravity Collection to Nolin River WWTP
Ability to Construct	1	0
Ability to Expand	0	1
Ability to Upgrade for Future Flow	0	0
Operation and Maintenance	0	1
Anticipated Public Acceptance	1	-1
Regional Solution	1	0
Reliability	0	0
Odor Potential	0	0
Impact to Land	1	0
Impact on Future Development	0	1
Impact to KPDES permit	-1	0
Impact to Receiving stream	0	0
Easement Acquisition	0	0
Total	3	2

The noneconomic factors indicate that conveying wastewater to the Nolin River WWTP may be the best alternative for the Nolin River, Upper Nolin River, North Upper Nolin River, Cox Run, and Jackson Branch Watersheds.

TABLE 11

SOUTHERN SERVICE AREAS-BILLY CREEK NONMONETARY FACTORS

Factor	Alternative	
	Pump to E-Town WWTP	Pump to Nolin River WWTP
Ability to Construct	1	0
Ability to Expand	0	0
Ability to Upgrade for Future Flow	1	0
Operation and Maintenance	1	-1
Anticipated Public Acceptance	1	0
Regional Solution	1	0
Reliability	1	0
Odor Potential	0	-1
Impact to Land	1	0
Impact on Future Development	0	1
Impact to KPDES permit	-1	0
Impact to Receiving stream	0	0
Easement Acquisition	-1	-1
Total	5	-2

The noneconomic factors indicate that conveying wastewater to the Elizabethtown WWTP may be the best alternative for the Billy Creek Watershed

TABLE 12

EASTERN SERVICE AREAS-BUFFALO CREEK NONMONETARY FACTORS

Factor	Alternative
	Pump to E-Town WWTP
Ability to Construct	1
Ability to Expand	0
Ability to Upgrade for Future Flow	0
Operation and Maintenance	1
Anticipated Public Acceptance	1
Regional Solution	1
Reliability	1
Odor Potential	0
Impact to Land	1
Impact on Future Development	0
Impact to KPDES permit	-1
Impact to Receiving stream	0
Easement Acquisition	0
Total	5

The noneconomic factors indicate that conveying wastewater to the Elizabethtown WWTP may be the best alternative for the Buffalo Creek Watershed.

TABLE 13

EASTERN SERVICE AREAS-UPPER YOUNGER CREEK NONMONETARY FACTORS

Factor	Alternative
	Pump to E-Town WWTP
Ability to Construct	0
Ability to Expand	0
Ability to Upgrade for Future Flow	0
Operation and Maintenance	0
Anticipated Public Acceptance	1
Regional Solution	1
Reliability	0
Odor Potential	-1
Impact to Land	-1
Impact on Future Development	0
Impact to KPDES permit	-1
Impact to Receiving stream	0
Easement Acquisition	0
Total	-1

The noneconomic factors indicate that conveying wastewater to the Elizabethtown WWTP may be the best alternative for the Upper Younger Creek Watershed.

TABLE 14

EASTERN SERVICE AREAS-CEDAR CREEK NONMONETARY FACTORS

Factor	Alternative	
	Pump to E-Town WWTP	Pump to Fort Knox WWTP
Ability to Construct	0	1
Ability to Expand	0	0
Ability to Upgrade for Future Flow	0	0
Operation and Maintenance	0	-1
Anticipated Public Acceptance	1	1
Regional Solution	1	1
Reliability	1	-1
Odor Potential	1	-1
Impact to Land	-1	0
Impact on Future Development	0	0
Impact to KPDES permit	-1	1
Impact to Receiving stream	0	-1
Easement Acquisition	-1	-1
Total	1	-1

The noneconomic factors indicate that conveying wastewater to the Elizabethtown WWTP may be the best alternative for the Cedar Creek Watershed.

TABLE 15

EASTERN SERVICE AREAS-CLEAR CREEK NONMONETARY FACTORS

Factor	Alternative
	Pump to E-Town WWTP
Ability to Construct	1
Ability to Expand	0
Ability to Upgrade for Future Flow	0
Operation and Maintenance	1
Anticipated Public Acceptance	1
Regional Solution	1
Reliability	1
Odor Potential	-1
Impact to Land	-1
Impact on Future Development	0
Impact to KPDES permit	-1
Impact to Receiving stream	0
Easement Acquisition	-1
Total	1

The noneconomic factors indicate that conveying wastewater to the Elizabethtown WWTP may be the best alternative for the Clear Creek Watershed.

TABLE 16

EASTERN SERVICE AREAS-UPPER BUFFALO CREEK NONMONETARY FACTORS

Factor	Alternative
	Pump to E-Town WWTP
Ability to Construct	1
Ability to Expand	0
Ability to Upgrade for Future Flow	0
Operation and Maintenance	0
Anticipated Public Acceptance	1
Regional Solution	1
Reliability	1
Odor Potential	0
Impact to Land	0
Impact on Future Development	0
Impact to KPDES permit	-1
Impact to Receiving stream	0
Easement Acquisition	-1
Total	2

The noneconomic factors indicate that conveying wastewater to the Elizabethtown WWTP may be the best alternative for the Upper Buffalo Creek Watershed.

TABLE 17

EASTERN SERVICE AREAS-UPPER VALLEY CREEK NONMONETARY FACTORS

Factor	Alternative
	Pump to E-Town WWTP
Ability to Construct	0
Ability to Expand	0
Ability to Upgrade for Future Flow	0
Operation and Maintenance	0
Anticipated Public Acceptance	1
Regional Solution	1
Reliability	0
Odor Potential	0
Impact to Land	0
Impact on Future Development	0
Impact to KPDES permit	-1
Impact to Receiving stream	0
Easement Acquisition	0
Total	1

The noneconomic factors indicate that conveying wastewater to the Elizabethtown WWTP may be the best alternative for the Upper Valley Creek Watershed.

TABLE 18

VALLEY CREEK SERVICE AREA-NONMONETARY FACTORS

Factor	Alternative
	Pump to E-Town WWTP
Ability to Construct	1
Ability to Expand	0
Ability to Upgrade for Future Flow	0
Operation and Maintenance	1
Anticipated Public Acceptance	1
Regional Solution	1
Reliability	1
Odor Potential	0
Impact to Land	1
Impact on Future Development	0
Impact to KPDES permit	-1
Impact to Receiving stream	0
Easement Acquisition	0
Total	5

The noneconomic factors indicate that conveying wastewater to the Elizabethtown WWTP may be the best alternative for the Valley Creek Watershed.

TABLE 19

UPTON AND SONORA SERVICE AREA-SANDY CREEK AND DORSEY RUN NONMONETARY FACTORS

Factor	Alternative		
	Pump to E-Town WWTP	Pump to Nolin River WWTP	Pump to Caveland IPS
Ability to Construct	0	0	0
Ability to Expand	0	0	0
Ability to Upgrade for Future Flow	0	0	0
Operation and Maintenance	0	0	-1
Anticipated Public Acceptance	1	0	1
Regional Solution	1	0	1
Reliability	-1	-1	-1
Odor Potential	-1	-1	-1
Impact to Land	-1	-1	0
Impact on Future Development	1	1	0
Impact to KPDES permit	-1	0	0
Impact to Receiving stream	0	1	0
Easement Acquisition	-1	-1	0
Total	-2	-2	-1

The noneconomic factors indicate that conveying wastewater to the Caveland Intermediate Pump Station may be the best alternative for the Sandy Creek and Dorsey Run Watersheds.

APPENDIX I
NEWS ARTICLES OF PLAN

Heartland

CITY, COUNTY, STATE AND REGION

B1

ABBY	B4	NEIGHBORS ...	B4
CALENDAR	B2	PUZZLES	B10
DEATHS	B2	MONEY	B8
HOROSCOPE .	B11	MOVIES	B10

Study names top rural sewer needs

Wastewater facilities plan lists three options for new rural lines

By JOHN FRIEDLEIN
jfriedlein@thenewsenterprise.com

HARDIN COUNTY - The project manager of a rural sewer study announced last week which areas of the county are considered high priority and gave examples of where their wastewater might flow.

Areas most in need of sewers are in the central and southern parts of the county, from Rineyville to just outside Elizabethtown to Upton.

Elizabethtown, Radcliff, Vine Grove and Fort Knox

already have sewers and wastewater treatment plants. Eleven smaller plants operate in the county - at schools and truck stops, for instance.

The Hardin County Water District No. 2 Regional Wastewater Facilities Plan lists three options for new rural lines. First, they could flow to existing treatment plants in the county's three cities and at Fort Knox. Second, waste from Upton and Sonora might travel to a Hart County plant, which has expressed interest in the project, said project manager Mark Sneve.

And third, new facilities in rural areas could process the sewage.

The amount a particular station could handle may depend on its current load. The Elizabethtown treatment center, for instance, already is at 86 percent of its capacity, according to the study. Vine Grove, on the other hand, is at 41 percent.

Almost all of the areas in most immediate need of sewers could have their lines flow to more than one of the existing or proposed treatment facilities.

"It's not a one-size-fits-all solution," said Sneve, who is with Strand Associates of Louisville. He addressed a group of county planners during a public forum about development issues.

The study, which will develop wastewater options for the next 20 years, is the first of its kind for the county as far as Judge-Executive Harry Berry knows. A planned approach like this improves chances of receiving competitive grants, he said in a previ-

Turn to SEWER, B2

TOP PRIORITY

High-priority areas for rural sewer service in the next 10 years include:

- Boone Road
- LaVista Estates area
- Burns-Deckard School roads
- Heartland Mobile Home Park
- Airview Estates
- Thoroughbred Estates/Thousand Oaks
- Oxmoor Village
- Gilead Church-Glendale roads
- Glendale Industrial Site
- North Glendale Road area
- New Glendale Road area
- Valley Creek industrial area
- Sonora
- Upton
- Smithersville

SEWER: Second phase will determine costs, funding

Continued from B1

ous interview.

Sometime in the next few months, wastewater planners will listen to public comments during a forum.

The next step of the study will be to determine how much these projects might cost and explore avenues for funding, which could include government grants. The Natural Resources and Conservation Service paid

for the \$200,000 study.

The need for sewers increases with housing development, most of which is occurring in rural areas of the county.

While these lines may spur even more development, they could help preserve the rural landscape. For example, builders could put homes on smaller lots, thereby saving room for green-space. Issues such as rural preservation are a major concern with planners as they consider changes to the county's comprehensive plan.

Increasing lot sizes to

make room for septic systems is an option under consideration.

Overloaded septic systems flood lateral fields and back up sewage into homes when heavy water use overloads the system. On a half-acre lot, it doesn't take long to develop a "big odor," said magistrate Doug Goodman, a former certified septic tank installer.

"Any time you get under an acre, you're just asking for trouble with septic systems," he said.

Goodman said there is a "big need" for rural sewers.

John Friedlein can be reached at 769-1200, Ext. 237.

Heartland

CITY, COUNTY, STATE AND REGION

B1

ABBY	B3	HOROSCOPE	I
CALENDAR	B2	MONEY	I
COMICS	B5	NEIGHBORS	I
DEATHS	B2	PUZZLES	E
HELOISE	B4	TELEVISION	B

Study suggests hauling sewage to treatment plants

By SARAH BERKSHIRE
sberkshire@thenewsenterprise.com

ELIZABETHTOWN – Hardin County Water District No. 2 recently completed a major study of wastewater needs in the county and a regional wastewater plan.

The study set out to determine the best way to bring sewer service to residents outside municipal service areas and to reduce the number of lateral lines, water district General Manager James Jeffries said.

Although building county wastewater treatment plants was considered, the study determined it would be best to collect and transport wastewater to existing treatment plants, he said.

The idea applies to new developments not

served by Elizabethtown, Radcliff or Vine Grove systems, which the study said are operating at 86, 59 and 41 percent capacity respectively.

An agreement between local entities establishes that existing treatment plants are open to accepting county wastewater, though not committed, Jeffries said.

The study considered future demand on a county wastewater system. The population is expected to grow by 6,200 people in unincorporated areas of Hardin County in the next 10 years and another 6,800 in the following 10 years, according to a news release from Strand Associates, an engineering firm that led the study.

Infrastructure needed to collect and transport sewage from new developments would cost nearly \$50 million in the first 10 years and \$30 million

in the second 10-year period, the release said.

How the recommended plan would be implemented and other details, such as how the plan could be applied to already-developed areas, is still under review, Jeffries said.

“We would like to have county sewer,” he said, noting that communities such as Rineyville, Sonora and Glendale need the service to maintain growth.

The \$200,000 study was funded by a grant from the Natural Resource and Conservation Service.

A copy of the plan is available for review at the Hardin County Water District No. 2 office at 360 Ring Road in Elizabethtown.

Sarah Berkshire can be reached at 769-1200, Ext. 428.

Report news of local interest. Call (270) 769-1200, Ext. 290, or e-mail ne@thenewsenterprise.com

APPENDIX J
CLEARINGHOUSE LETTERS



Waterfront Plaza
Suite 710
325 West Main Street
Louisville, KY 40202
Phone: 502-583-7020
Fax: 502-583-7026

Office Locations

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Louisville, KY
Lexington, KY
Mobile, AL
Columbus, IN
Columbus, OH
Indianapolis, IN
Milwaukee, WI
Cincinnati, OH

www.strand.com

November 9, 2007

Mr. David L. Morgan
Executive Director and State Historic Preservation Officer
Kentucky Heritage Council
300 Washington Street
Frankfort, Kentucky 40601

Re: Hardin County Water District No. 2 Regional Wastewater Facilities Plan

Dear Mr. Davis:

Strand Associates, Inc. is preparing a Regional Wastewater Facilities Plan for Hardin County Water District No. 2 (HCWD 2). The plan calls for the installation of wastewater collection systems, trunk sewers, pump stations, and force mains to convey wastewater to existing wastewater treatment plants at multiple locations in Hardin County. The attached figures show the approximate location of the trunk sewers, pump stations, and force mains for the projects expected to occur within the first 10 years of the 20 year plan. Gravity collector sewers would be located in developed or developing neighborhoods and connected to the trunk sewers.

Please review the proposed projects and reply with any concerns over local historical or archeological resources potentially affected by these projects. Should you have any questions concerning this matter, please do not hesitate contact me at (502) 583 7020.

Sincerely,

STRAND ASSOCIATES, INC.

A handwritten signature in cursive script that reads 'Mark A. Sneve'.

Mark A. Sneve, P.E.

cc: James Jefferies, General Manager of HCWD 2

Enclosures:

- Figure No.N-1 – Pawley Creek and Upper Otter Creek Watersheds
- Figure No.N-2 – Brushy Fork Creek Watershed
- Figure No.N-3 – Mill Creek Branch Watershed
- Figure No.S-1 – North Upper Nolin River and Rose Run Watersheds
- Figure No.E-1 – Upper Younger Creek Watershed
- Figure No.US-1 – Dorsey Run and Sandy Creek Watersheds



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Columbus, IN
Columbus, OH
Indianapolis, IN
Milwaukee, WI
Cincinnati, OH

www.strand.com

November 9, 2007

Mr. Wayne L. Davis
Kentucky Fish and Wildlife Service
#1 Sportsman's Lane
Frankfort, Kentucky 40601

Re: Hardin County Water District No. 2 Regional Wastewater Facilities Plan

Dear Mr. Davis:

Strand Associates, Inc. is preparing a Regional Wastewater Facilities Plan for Hardin County Water District No. 2 (HCWD 2). The plan calls for the installation of wastewater collection systems, trunk sewers, pump stations, and force mains to convey wastewater to existing wastewater treatment plants at multiple locations in Hardin County. The attached figures show the approximate location of the trunk sewers, pump stations, and force mains for the projects expected to occur within the first 10 years of the 20 year plan. Gravity collector sewers would be located in developed or developing neighborhoods and connected to the trunk sewers.

The construction of these projects will have a positive affect on water quality and public health. Construction activity will attempt to minimize impacts to wetlands, disturbances to forest lands, and attempt to minimize stream crossings.

Please review the proposed projects and reply with any concerns over local fish and wildlife resources affected by these projects. Should you have any questions concerning this matter, please do not hesitate contact me at (502) 583 7020.

Sincerely,

STRAND ASSOCIATES, INC.

A handwritten signature in cursive script that reads 'Mark A. Sneve'.

Mark A. Sneve, P.E.

cc: James Jefferies, General Manager of HCWD 2

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Cincinnati, OH

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November 9, 2007

Ms. Mindi Lawson
U.S. Fish and Wildlife Service
3761 Georgetown Road
Frankfort, Kentucky 40601

Re: Hardin County Water District No. 2 Regional Wastewater Facilities Plan

Dear Ms. Lawson:

Strand Associates, Inc. is preparing a Regional Wastewater Facilities Plan for Hardin County Water District No. 2 (HCWD 2). The plan calls for the installation of wastewater collection systems, trunk sewers, pump stations, and force mains to convey wastewater to existing wastewater treatment plants at multiple locations in Hardin County. The attached figures show the approximate location of the trunk sewers, pump stations, and force mains for the projects expected to occur within the first 10 years of the 20 year plan. Gravity collector sewers would be located in developed or developing neighborhoods and connected to the trunk sewers.

The construction of these projects will have a positive affect on water quality and public health. Construction activity will attempt to minimize impacts to wetlands, disturbances to forest lands, and attempt to avoid stream crossings.

Please review the proposed projects and reply with any concerns over local fish and wildlife resources affected by these projects. Should you have any questions concerning this matter, please do not hesitate contact me at (502) 583 7020.

Sincerely,

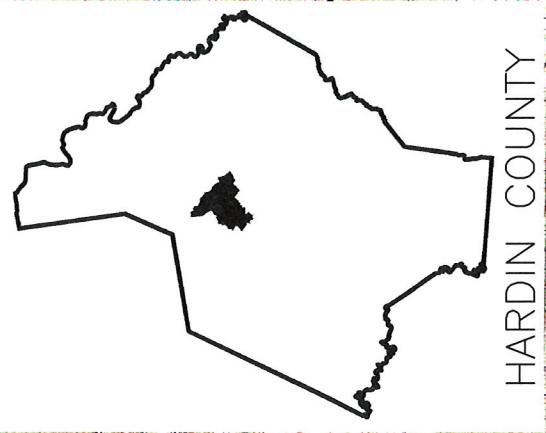
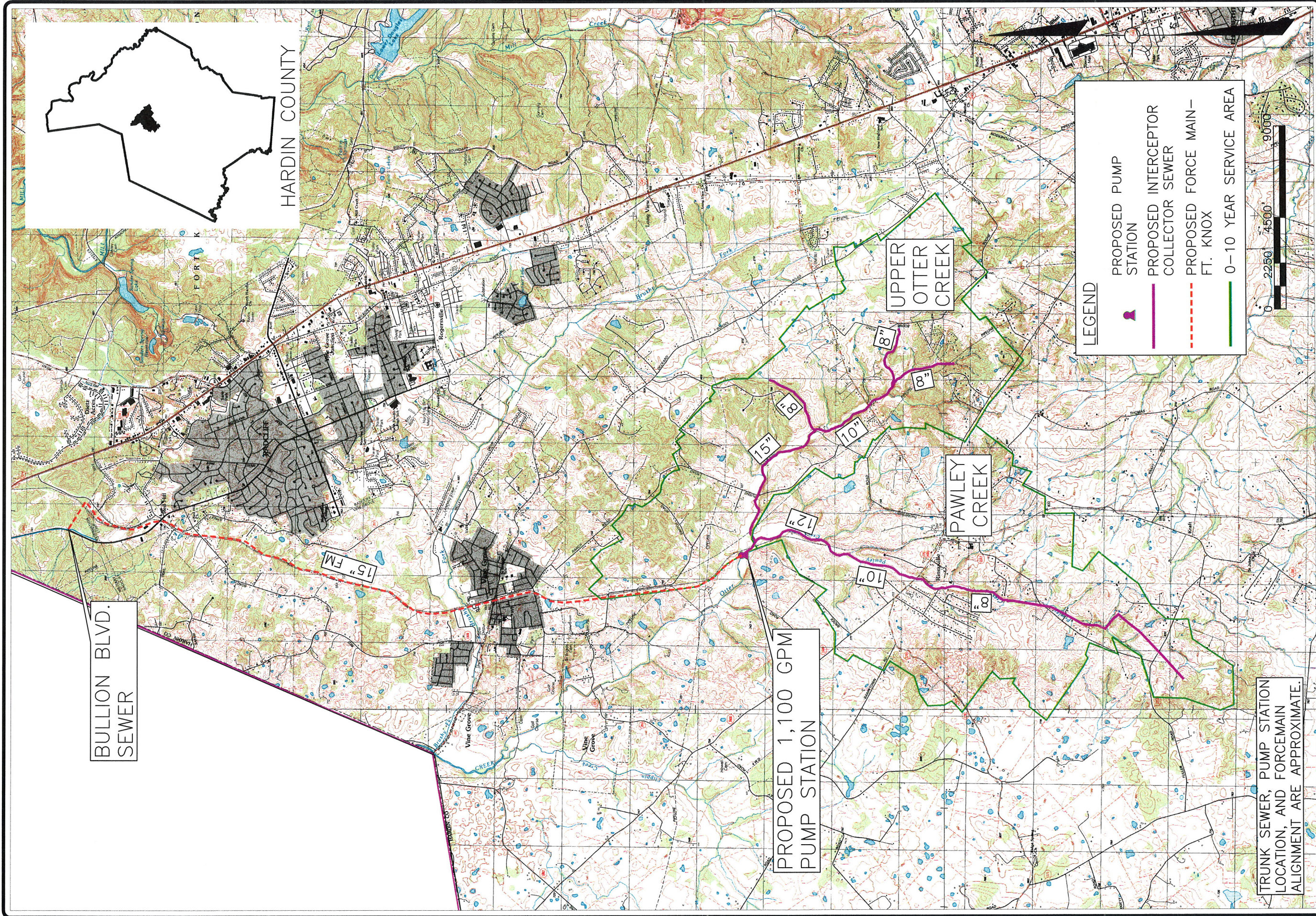
STRAND ASSOCIATES, INC.

Mark A. Sneve, P.E.

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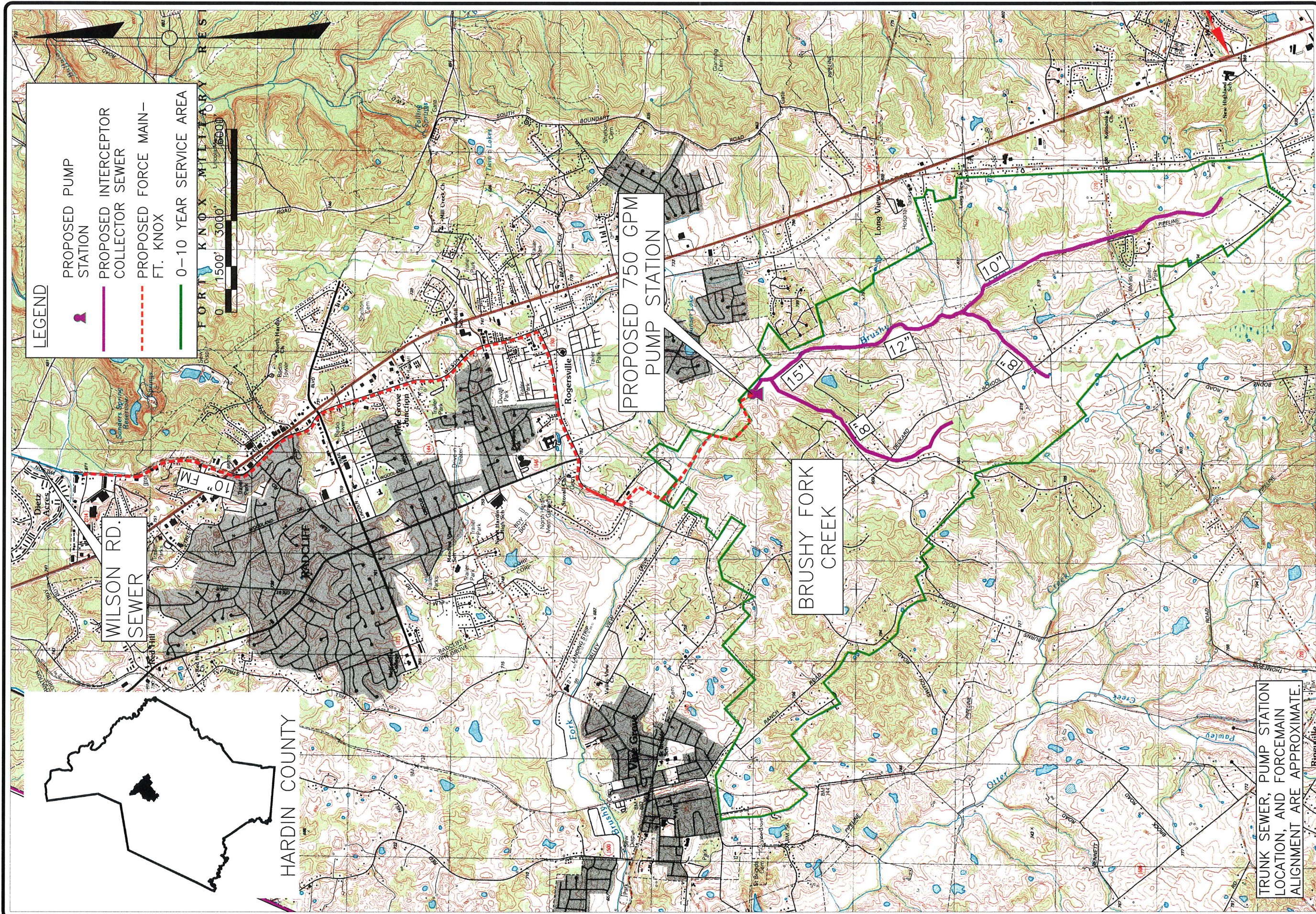


**PAWLEY CREEK AND UPPER OTTER CREEK WATERSHEDS
USGS TOPOGRAPHIC MAPS FOR VINE GROVE (L30) AND CECILIA (M30)**

REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY



FIGURE NO. N-1
5-980.001

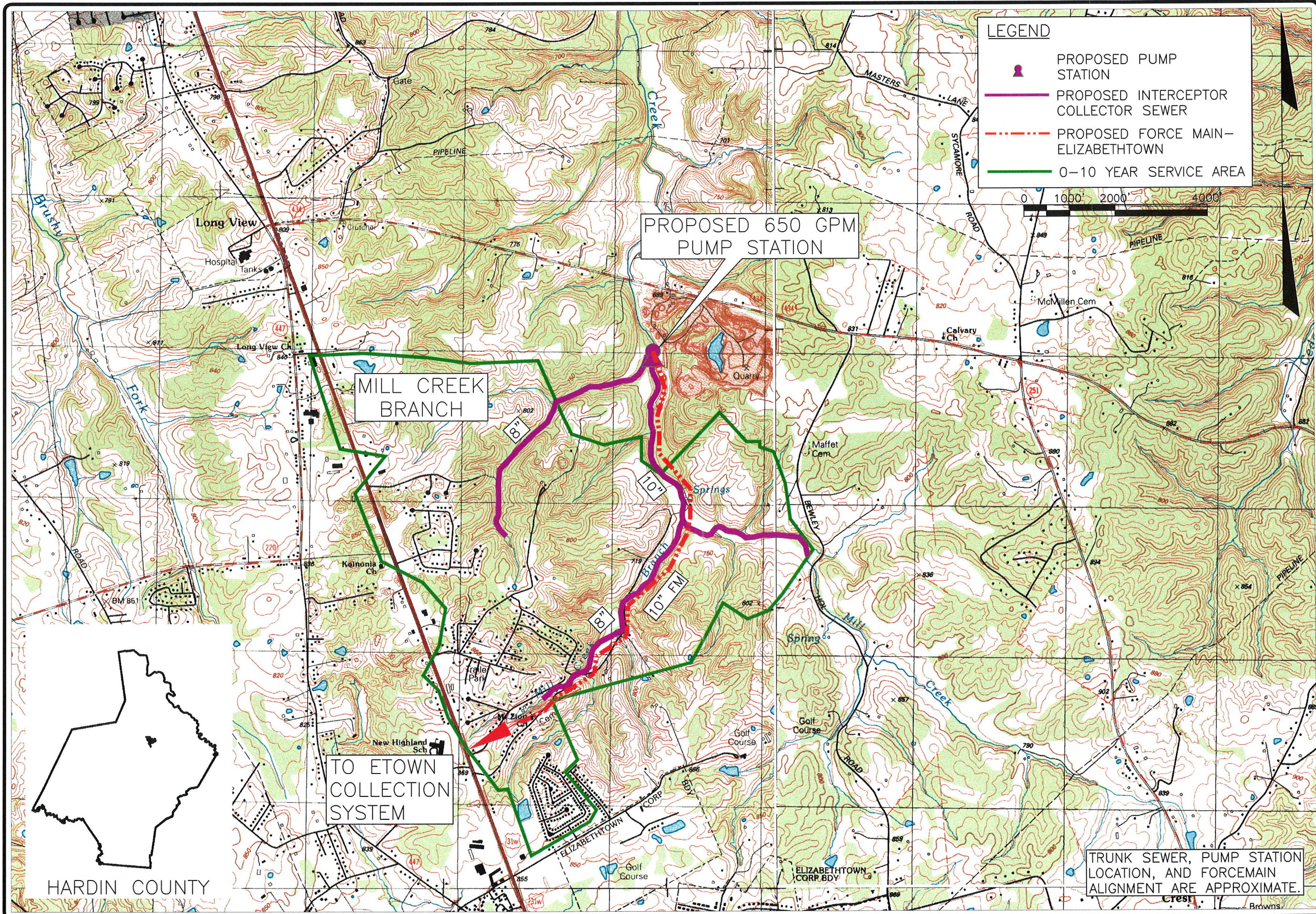


**BRUSHY FORK CREEK WATERSHED
USGS TOPOGRAPHIC MAP FOR VINE GROVE (L30)**





**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**

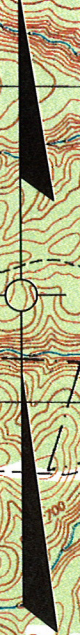
STRAND ASSOCIATES, INC. ENGINEERS

FIGURE NO. N-2
5-980.001



LEGEND

-  PROPOSED PUMP STATION
-  PROPOSED INTERCEPTOR COLLECTOR SEWER
-  PROPOSED FORCE MAIN- ELIZABETHTOWN
-  0-10 YEAR SERVICE AREA



PROPOSED 650 GPM PUMP STATION

MILL CREEK BRANCH

TO ETOWN COLLECTION SYSTEM

TRUNK SEWER, PUMP STATION LOCATION, AND FORCEMAIN ALIGNMENT ARE APPROXIMATE.

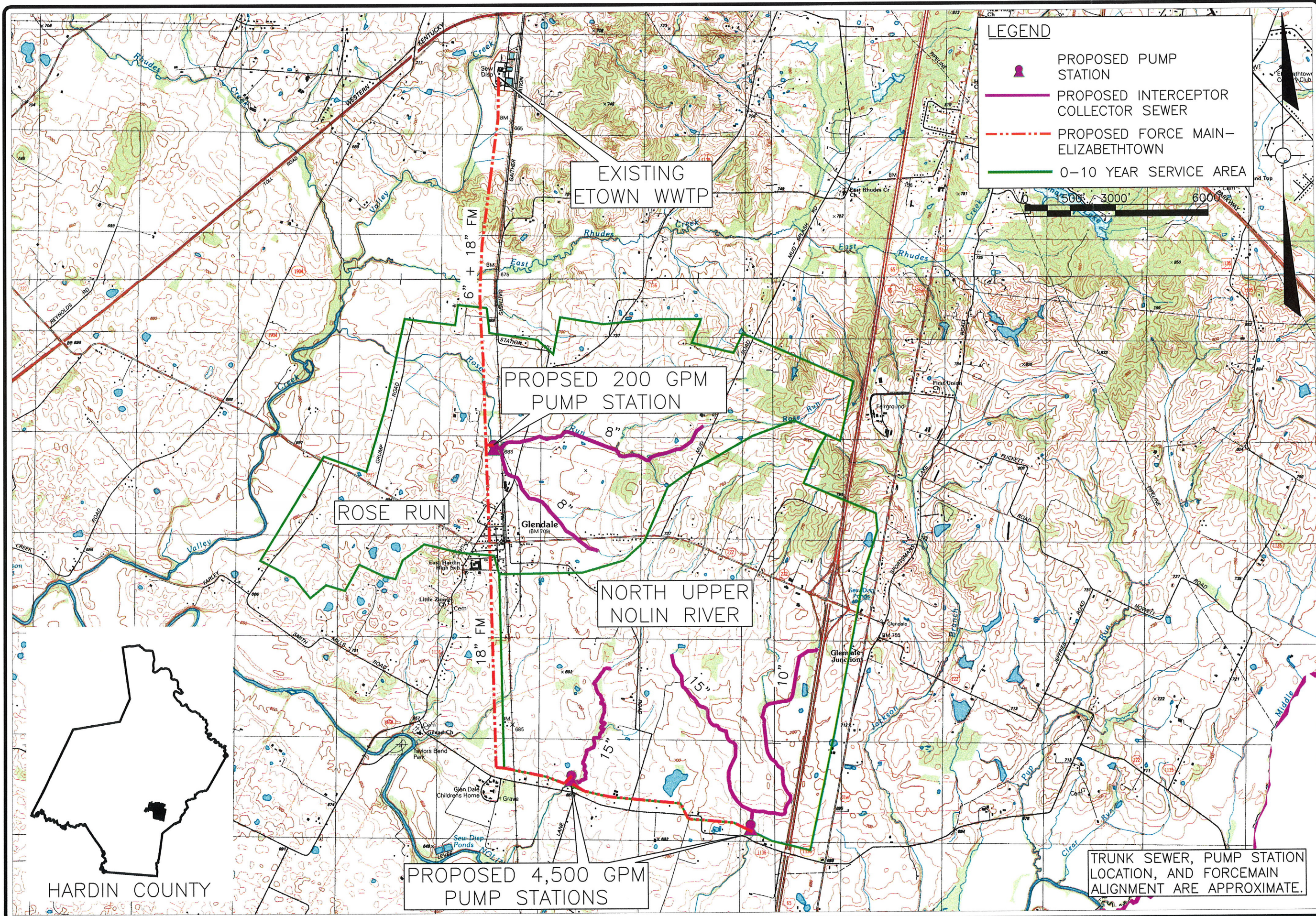
HARDIN COUNTY

MILL CREEK BRANCH WATERSHED
USGS TOPOGRAPHIC MAPS FOR VINE GROVE (L30) AND COLESBURG (L31)





REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY



FIGURE NO. N-3
5-980.001




LEGEND

-  PROPOSED PUMP STATION
-  PROPOSED INTERCEPTOR COLLECTOR SEWER
-  PROPOSED FORCE MAIN-ELIZABETHTOWN
-  0-10 YEAR SERVICE AREA

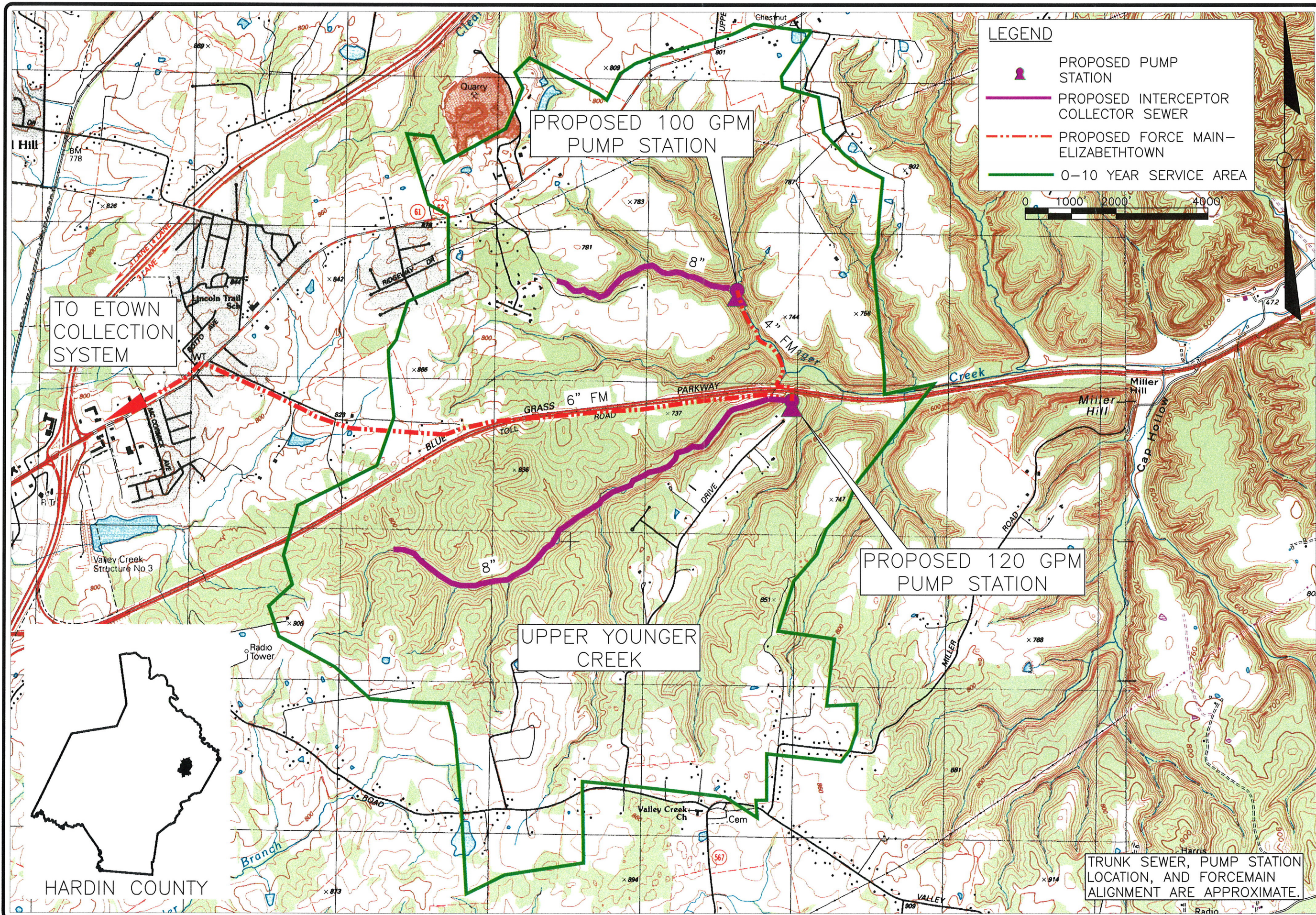
**NORTH UPPER NOLIN RIVER AND ROSE RUN WATERSHEDS
USGS TOPOGRAPHIC MAPS FOR SONORA (N30) AND TONIEVILLE (N31)**

**REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY**



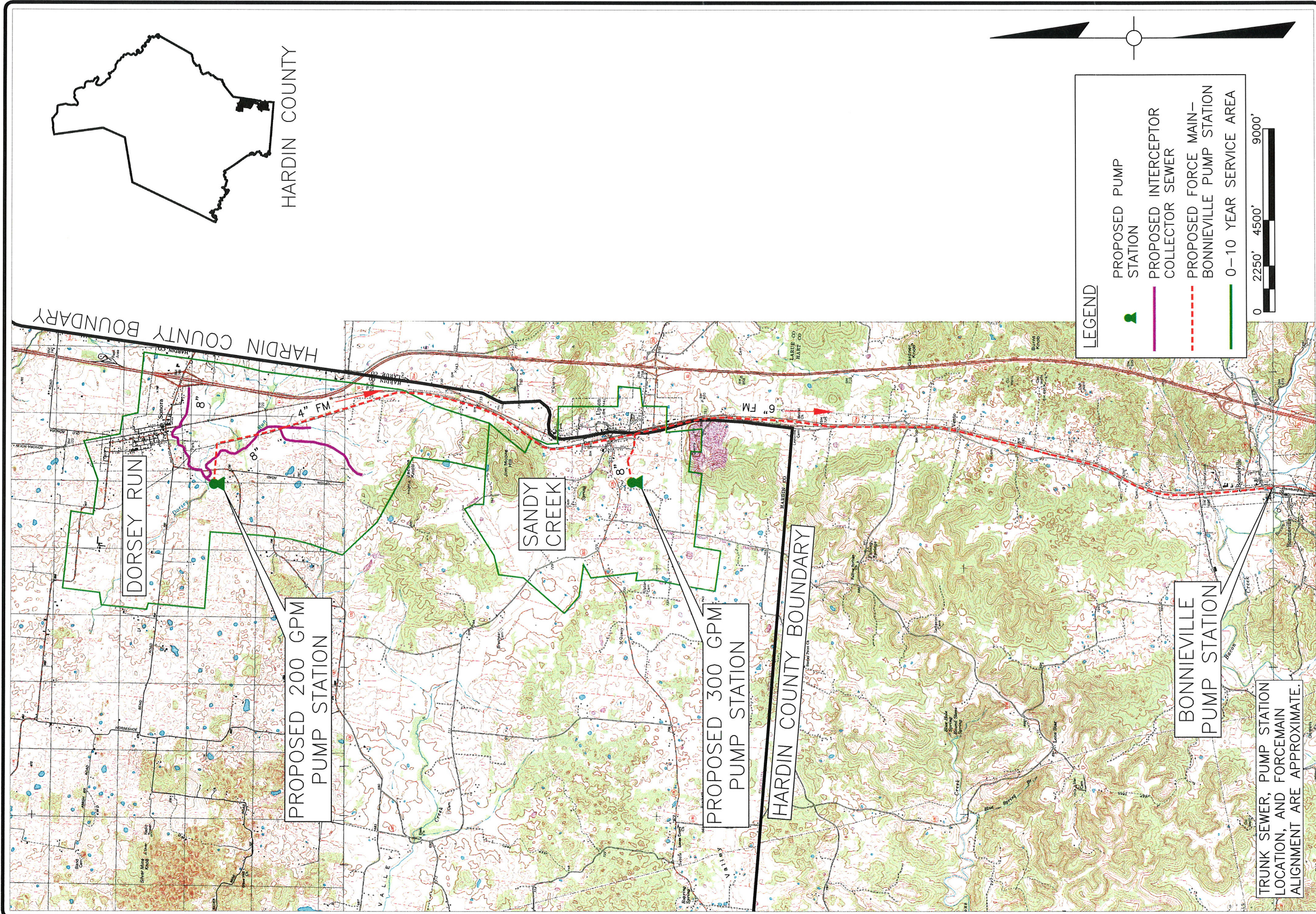
STRAND ASSOCIATES, INC. ENGINEERS

FIGURE NO. S-1
5-980.001

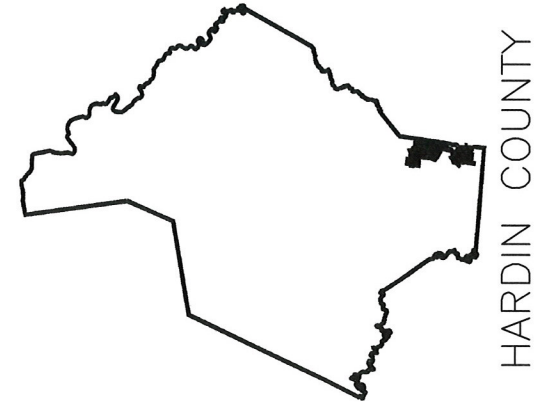


UPPER YOUNGER CREEK WATERSHED
USGS TOPOGRAPHIC MAP FOR ELIZABETHTOWN (M31)
REGIONAL WASTEWATER FACILITIES PLAN
HARDIN COUNTY WATER DISTRICT NO. 2
HARDIN COUNTY, KENTUCKY


STRAND ASSOCIATES, INC.
ENGINEERS
FIGURE NO. E-1
 5-980.001



TRUNK SEWER, PUMP STATION LOCATION, AND FORCEMAIN ALIGNMENT ARE APPROXIMATE.



HARDIN COUNTY

DORSEY RUN AND SANDY CREEK WATERSHEDS
USGS TOPOGRAPHIC MAPS FOR SONORA (N30) AND UPTON (O30)
 REGIONAL WASTEWATER FACILITIES PLAN
 HARDIN COUNTY WATER DISTRICT NO. 2
 HARDIN COUNTY, KENTUCKY



FIGURE NO. US-1
 5-980.001