

Water-Resource Development: A Strategic Plan

Summary of Water Systems Pennyrile Area Development District

Water Resource Development Commission

October, 1999

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Pennyriple Area Development District

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REGIONAL OVERVIEW

(Pennyriple ADD Existing & Proposed Water Lines Map)

- Estimated 1999 population of 207,000--89% on public water
- Estimated 2020 population of 228,000--92% on public water
- 3,250 miles of water lines, with plans for 1,050 additional miles
- Estimated funding needs for public water 2000-2005--\$59,500,000
- Estimated funding needs for public water 2006-2020--\$10,300,000

The Pennyriple Area Development District region had an estimated population of 206,990 (83,759 households) in 1999 with a projected population of 222,700 (94,600 households) in 2020. There are 3,250 miles of water lines in the region serving 184,000 people, or about 89% of the region's population. 1,050 miles of proposed water line extensions for the period 2000-2020 would provide service to 3,500 additional households. About 23,000 people in the region rely on private domestic water systems: 16,200 on wells and 6,800 on hauled water and other sources.

Estimated populations and public water service for the nine counties in the region are given below:

County	1999 Pop	On Public	2020 Pop	On Public
Caldwell	13,300	11,300 (85%)	13,700	12,600 (92%)
Christian	66,700	57,500 (86%)	77,500	69,000 (89%)
Crittenden	9,350	6,500 (70%)	8,950	8,100 (91%)
Hopkins	45,700	43,400 (95%)	44,800	43,000 (96%)
Livingston	9,300	7,600 (82%)	9,300	8,400 (90%)
Lyon	6,800	5,800 (86%)	7,300	6,400 (88%)
Muhlenberg	32,000	29,100 (91%)	34,100	31,400 (92%)
Todd	11,200	10,800 (96%)	11,100	11,100 (100%)
Trigg	12,600	12,000 (95%)	16,000	15,200 (96%)
Region	207,000	184,000 (89%)	223,000	205,000 (92%)

EXISTING & PROPOSED WATER LINES

PEADD
Kentucky

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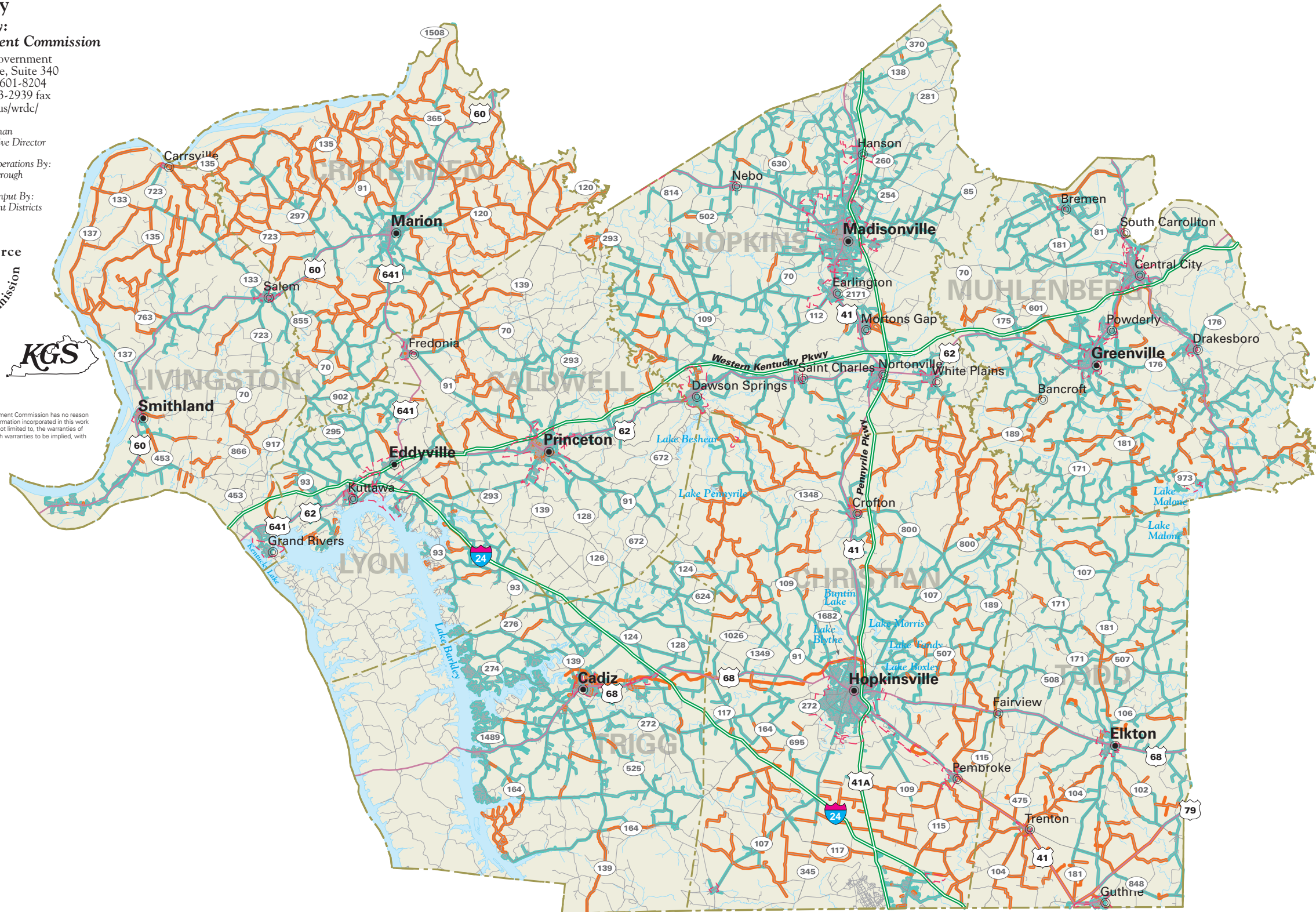
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WATER LINES
 Existing Water Lines
 Proposed Water Lines

65 public water systems serve the region: 46 community systems--26 municipal, 16 water districts, 4 private, and 19 non-community systems. There are 17 small (501 to 3,300 people served) community systems--15 municipalities and 2 water districts.

Estimated costs for public water expansions and associated system upgrades are:

Estimated Costs - Proposed Projects, 2000-2005

COUNTY/System		New Customers		Rehab	Source	Treatment	Tanks/ Pumps	Total
	Miles	Number	Cost in \$1000	in \$1000	in \$1000	in \$1000	in \$1000	in \$1000
CALDWELL								-
Caldwell Co. W/D	43	198	1,367					1,367
Princeton		212	358	590		3,800	1,000	5,748
Fredonia							370	370
TOTAL	43	410	1,725	590		3,800	1,370	7,485
								-
CHRISTIAN								-
Pembroke	9	10	276	1,200				1,476
Oak Grove	2		85	36				121
Hopkinsville	11		346			12,630	540	13,516
Crofton				60		50	44	154
Christian Co. W/D	65	270	2,862					2,862
TOTAL	87	280	3,569	1,296		12,680	584	18,129
								-
CRITTENDEN								-
Crittenden/Lyon W/D	248	867	7,326				3,000	10,326
TOTAL	248	867	7,326				3,000	10,326
								-
HOPKINS								-
South Hopkins W/D	32	106	584				425	1,009
North Hopkins W/D	4		120				338	458
Nebo	5	14	82					82
Mortons Gap				220			40	260
Nortonville	9	105	300					300
White Plains	2	3	28					28
Dawson Springs				225			500	725
Madisonville	1	19	47	31				78
Earlington	4		148	17				165
TOTAL	25	141	1,309	493			1,303	3,105
								-
LIVINGSTON								-
Crittenden/Livingston W/D	86	298	2,706					2,706
Ledbetter	1		10	7				17
Grand River	23	151	645					645
Smithland	2	12	37	53				90
Salem							295	295
TOTAL	112	461	3,398	60			295	3,753
								-
LYON								-
Lyon Co. W/D	30	120	795					795
Eddyville						4,000		4,000
TOTAL	30	120	795			4,000		4,795
								-
MUHLENBERG								-
Muhlenberg Co. W/D				630			3,825	4,455

Appendix B - Pennyrite Area Development District • DRAFT

Muhlenberg Co. W/D #3	6	Est. 30	100					100
TOTAL	6	30	100	630			3,825	4,555
								-
TODD								-
Todd Co. W/D	121	44	678			252	1,200	2,130
Elkton			295					295
Trenton	23	50	379	247			300	926
TOTAL	144	94	1,352	247		252	1,500	3,351
								-
TRIGG								-
Barkley Lake W/D	48	45	1,546	105		1,200	800	3,651
Cadiz	2	41	350					350
TOTAL	50	86	1,896	105		1,200	800	4,001
								-
PENNYRILE	777	2,595	21,470	3,421	-	21,932	12,677	59,500

Estimated Costs - Proposed Projects, 2006-2020

COUNTY/System		New Customers		Rehab	Source	Treatment	Tanks/ Pumps	Total
	Miles	Number	Cost in \$1000	in \$1000	in \$1000	in \$1000	in \$1000	in \$1000
CHRISTIAN								-
Christian County Water District	230	Est. 760	6,900				1,500	8,400
Total	230	760	6,900				1,500	8,400
								-
TODD								-
Todd County Water District	47	Est. 155	1,404				500	1,904
Total	47	155	1,404				500	1,904
								-
PENNYRILE	277	915	8,304	-	-	-	2,000	10,304

CALDWELL COUNTY

(Caldwell County Water Service Area Map)

- Estimated 1999 population of 13,300--85% on public water
- Estimated 2020 population of 13,700--92% on public water
- 195 miles of water lines, with plans for 45 additional miles
- Estimated funding needs for public water 2000-2005--\$7,485,000
- Estimated funding needs for public water 2006-2020--\$0

Caldwell County had an estimated population of 13,331 (5,707 households) in 1999 with a projected population of 13,741 (6,123 households) in 2020. Public water is provided to over 5,000 customers, or about 85 percent of the county's residents. In areas of the county not served by public water, about 5 of 8 households rely on private domestic wells and 3 of 8 households rely on other sources. About 410 households will be added to public water service through new line extensions in 2000-2020.

Estimated Costs - Proposed Projects, 2000-2005

COUNTY/System		New Customers		Rehab	Source	Treatment	Tanks/ Pumps	Total
	Miles	Number	Cost in \$1000	in \$1000	in \$1000	in \$1000	in \$1000	in \$1000
CALDWELL								-
Caldwell Co. W/D	43	198	1,367					1,367
Princeton		212	358	590		3,800	1,000	5,748
Fredonia							370	370
TOTAL	43	410	1,725	590		3,800	1,370	7,485

PUBLIC WATER SYSTEMS

The residents of Caldwell County are presently provided water by a total of six public water systems: 2 municipal systems and 4 water districts. Of these systems, the three primary providers have their base of operations within the county. Those systems are the Caldwell County Water District, Princeton Water Department and the City of Fredonia Water Department. A small number of the Caldwell County residents are also serviced by systems located outside of their County. The South Hopkins Water District services approximately 102 customers in the eastern portion of the county, while Lake Barkley Water District serves 43 or so customers in southern Caldwell and the Lyon County Water District serves about 17 customers in the western part of the county.

WATER SERVICE AREAS CALDWELL COUNTY Kentucky

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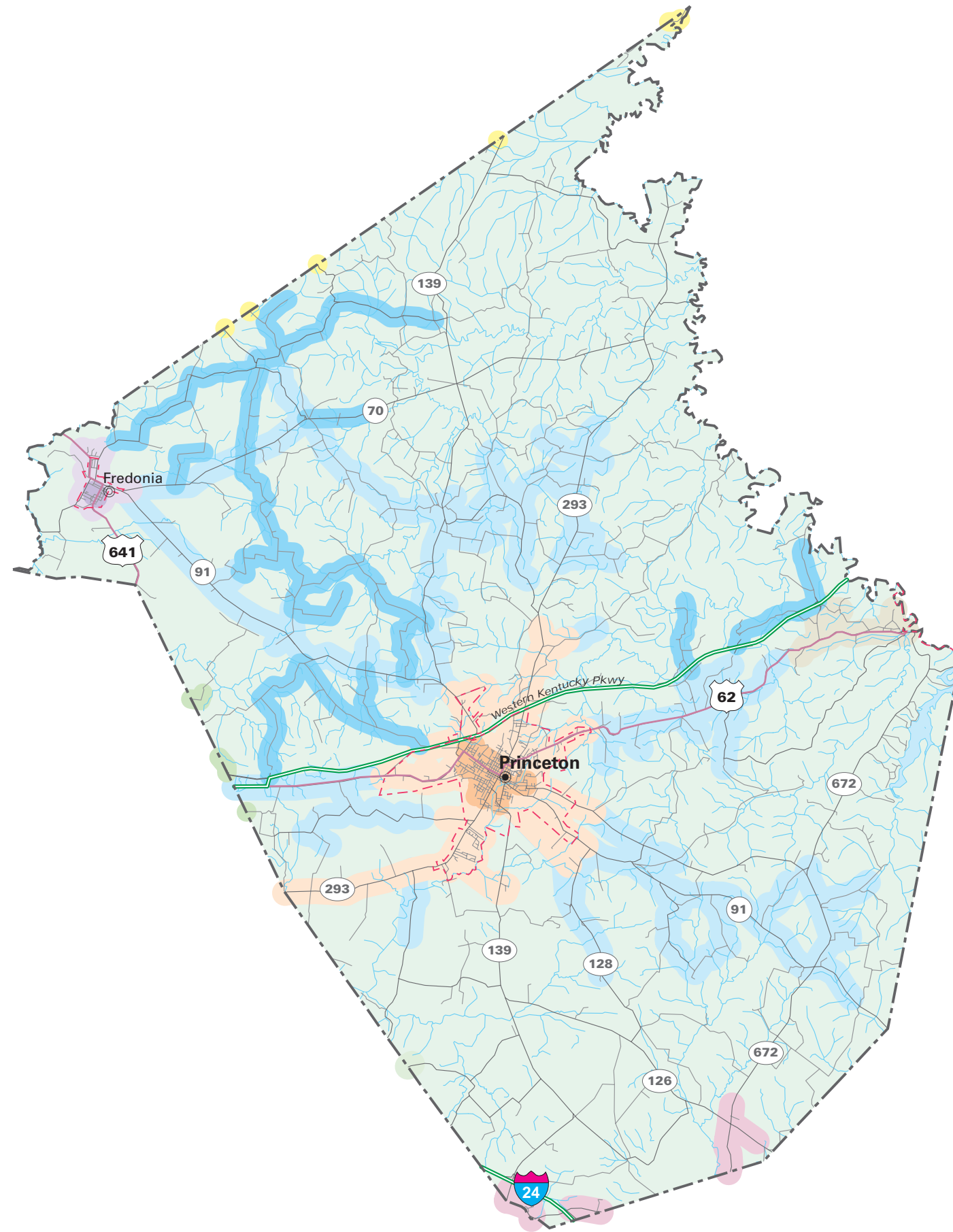
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WATER SERVICE STATUS BY OWNER

EXISTING SERVICE AREA	PROPOSED SERVICE AREA	OWNER
		SOUTH HOPKINS WATER DISTRICT
		PRINCETON WATER & WASTEWATER COMMISSION
		LYON COUNTY WATER DISTRICT
		FREDONIA WATER DEPARTMENT
		CRITTENDEN-LIVINGSTON COUNTY WATER DISTRICT
		CALDWELL COUNTY WATER DISTRICT
		BARKLEY LAKE WATER DISTRICT

CALDWELL COUNTY WATER DISTRICT

PWSID:.....	0170528
System Type:.....	COMMUNITY
Owner Type:.....	WATER DISTRICT
Surface Source:	
Purchase Source:	
Well Source:	
Sells Water to:	
Treatment Plant Capacity (MGD):.....	0.00
Percent Daily Average Production:	0.00
Total Tank Storage Capacity (gallons):.....	370,000.00
Total Service Connections:	769.00
Number of Employees:.....	2.70
Treatment Operator Class:.....	2D
Distribution Operator Class:	
Customer Rate for 1,000 Gallons:.....	7.12
O/M costs 1997:.....	177,304.00
O/M costs per Service Connection:	242.88
Net Revenue 1997:.....	62,929.00
Total Water Produced 1997 (gallons):.....	0.00
Water Sold 1997 (gallons):.....	30,436,000.00
Unaccounted-for Water 1997 (%):	19.22

The Caldwell County Water District was initially formed in 1987 but was not able to extend services to any residents until 1991 when it was able to serve its first 98 customers. Since that time several projects have been completed, resulting in a customer base of 760. Presently the district has two additional projects that have been approved for funding (and are yet to be completed) that will add 460 households to its customer base. The District currently purchases treated water from the city of Princeton for \$1.21 per 1,000 gallons. On an average day, the system uses approximately 101,000 gallons of water, with the proposed additions, that usage amount is expected to rise to a level of around 160,000 gallons per day. The district's distribution system and storage is considered to be adequate to support current usage levels (including upcoming project). The district's storage system consists of three tanks located at various points within its territory and has a total storage capacity of 370,000 gallons. Water loss for the district is minimal and mainly due to the flushing of the lines but there are a few areas that experience pressure problems. The calculated cost for 5,000 gallons of treated water (residential usage) is currently \$35.60 which when compared to other districts within the Pennyrile is considered to be at the high end.

PRINCETON WATER & WASTEWATER COMMISSION

PWSID:	0170360
System Type:.....	COMMUNITY
Owner Type:.....	WATER DISTRICT
Surface Source:.....	LAKE BARKLEY
Purchase Source:	
Well Source:	Yes
Sells Water to:	
Treatment Plant Capacity (MGD):.....	2.00
Percent Daily Average Production:	66.00
Total Tank Storage Capacity (gallons):.....	600,000.00
Total Service Connections:	3,020.00
Number of Employees:.....	11.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	3A
Customer Rate for 1,000 Gallons:.....	2.25
O/M costs 1997:.....	Not available
O/M costs per Service Connection:	Not available
Net Revenue 1997:	Not available
Total Water Produced 1997 (gallons):.....	Not available
Water Sold 1997 (gallons):.....	Not available
Unaccounted-for Water 1997 (%):	Not available

The Princeton Municipal Water & Sewer Commission gets its water from the nearby Lake Barkley and according to a Caldwell County water supply study completed in 1995 will continue to be an adequate source in terms of both quality and quantity. Their treatment facility has a capacity of 2 million gallons per day and is currently treating approximately 1,480,750 gallons of water per day or about 75% of its' capacity. Along with servicing the water needs of the citizens of Princeton, the Princeton Water System also sells treated water to the Lyon County Water District and the Caldwell County Water District. Due to the increased needs of the Caldwell County Water District and the growth of its own customer base, Princeton has begun to seek funds for the expansion of its treatment facility to 3.0 million gallons per day. The system presently has a storage capacity of 2.0 million gallons, which is held in 3 tanks at various locations within its system boundaries and at the clearwell located at the treatment plant. The city's distribution system is in fairly good condition and according to the county's Water Supply Plan recorded a loss or non-revenue water usage of 17% which is slightly above the normal limit of 15%.

Currently the system serves about 3,765 customers in and around the city of Princeton. The average residential customer of the system is charged \$11.25 for 5,000 gallons of usage,

which is considered extremely reasonable when compared to other municipal systems within the Pennyrile.

As mentioned previously, the growth in the demand from the other systems supplied by the Princeton water system coupled with the expected growth that will take place within the city, will severely hamper the treatment facility's ability to provide an adequate amount of treated water without expansion of the plant.

FREDONIA WATER DEPARTMENT

PWSID: 0170146
 System Type:..... COMMUNITY
 Owner Type:..... MUNICIPAL
 Surface Source:
 Purchase Source:
 Well Source:
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 0.00
 Percent Daily Average Production: 0.00
 Total Tank Storage Capacity (gallons):..... 50,000.00
 Total Service Connections: 325.00
 Number of Employees:..... 2.00
 Treatment Operator Class:..... 1D
 Distribution Operator Class:
 Customer Rate for 1,000 Gallons:..... 5.18
 O/M costs 1997:..... Not available
 O/M costs per Service Connection: Not available
 Net Revenue 1997: Not available
 Total Water Produced 1997 (gallons):..... Not available
 Water Sold 1997 (gallons):..... Not available
 Unaccounted-for Water 1997 (%): Not available

The City of Fredonia Water system purchases treated water from the city of Eddyville, which is located in Lyon County, just 8 miles south of the city along US highway 641. Currently the system provides service to 325 customers of which 308 are residential. The current residential customer is charged \$25.88 for 5,000 gallons of treated water. On an average day the system consumes 59,000 gallons of water. Of this amount, according to the Caldwell County water supply plan, 23.4% is categorized as non-revenue producing. This figure generally includes the water used to periodically flush the system. The City currently has one storage facility that holds approximately 50,000 gallons of water. The distribution systems is somewhat aged and is experiencing problems with low pressure and volume due to inadequate sized lines in various parts of the city. While having a tremendous need for

additional storage capacity the city's existing storage tank is in need of substantial repair and painting.

PRIVATE DOMESTIC SYSTEMS

About 2,000 people in Caldwell County rely on private domestic water supplies: 1,300 on wells and 700 on other sources.

In the southern and western two-thirds of Caldwell County more than three-quarters of the drilled wells in the uplands are adequate for a domestic supply. Yields as high as 50 gpm have been reported from wells penetrating large solution channels or fault zones. In the low-lying areas of Eddy Creek most wells are inadequate for domestic use unless the well intercepts a major solution opening in the limestone in which the yield could be very large. Ground water in the sandstone and shale-rich northeastern third of the county is not as prevalent as in the rest of the county which is predominately limestone. Most wells in the northeastern part of the county are inadequate for a domestic supply, however some wells in sandstone formations yield enough water for a domestic supply when located in areas bordering streams.

Springs with flows ranging from a few gallons per minute to 2,000 gpm are found in the county. Minimum flow generally occurs in early fall, maximum flows in late winter.

CHRISTIAN COUNTY

(Christian County Water Service Area Map)

- Estimated 1999 population of 66,700--86% on public water
- Estimated 2020 population of 77,500--89% on public water
- 540 miles of water lines, with plans for 320 additional miles
- Estimated funding needs for public water 2000-2005--\$18,129,000
- Estimated funding needs for public water 2006-2020--\$8,400,000

Christian County had an estimated population of 66,747 (25,098 households) in 1999 with a projected population of 77,456 (29,756 households) in 2020. Public water is provided to over 19,600 customers or about 7 out of 8 of the county's residents. In areas of the county not served by public water, about 3 of 4 households rely on private domestic wells and 1 of 4 households rely on other sources. An estimated 1,040 customers will be added to public water service through new line extensions in 2000-2020.

While difficult to project, Hopkinsville and Christian County are expected to have a significant growth due to the City's success in attracting industry. Over 1,200 new jobs are expected with new plant announcements. While not all of these jobs will be filled locally, many will. With the steady growth of Ft. Campbell and new spin-off commercial enterprises, it is expected that Christian County water usage will exceed the 20% projections in the water supply plan.

Estimated Costs - Proposed Projects, 2000-2005

COUNTY/System		New Customers		Rehab	Source	Treatment	Tanks/ Pumps	Total
	Miles	Number	Cost in \$1000	In \$1000	in \$1000	in \$1000	in \$1000	in \$1000
CHRISTIAN								-
Pembroke	9	10	276	1,200				1,476
Oak Grove	2		85	36				121
Hopkinsville	11		346			12,630	540	13,516
Crofton				60		50	44	154
Christian Co. W/D	65	270	2,862					2,862
TOTAL	87	280	3,569	1,296		12,680	584	18,129

Estimated Costs - Proposed Projects, 2006-2020

COUNTY/System		New Customers		Rehab	Source	Treatment	Tanks/ Pumps	Total
	Miles	Number	Cost in \$1000	in \$1000	in \$1000	in \$1000	in \$1000	in \$1000
CHRISTIAN								-
Christian County W/D	230	Est. 760	6,900				1,500	8,400
Total	230	760	6,900				1,500	8,400

WATER SERVICE AREAS CHRISTIAN COUNTY Kentucky

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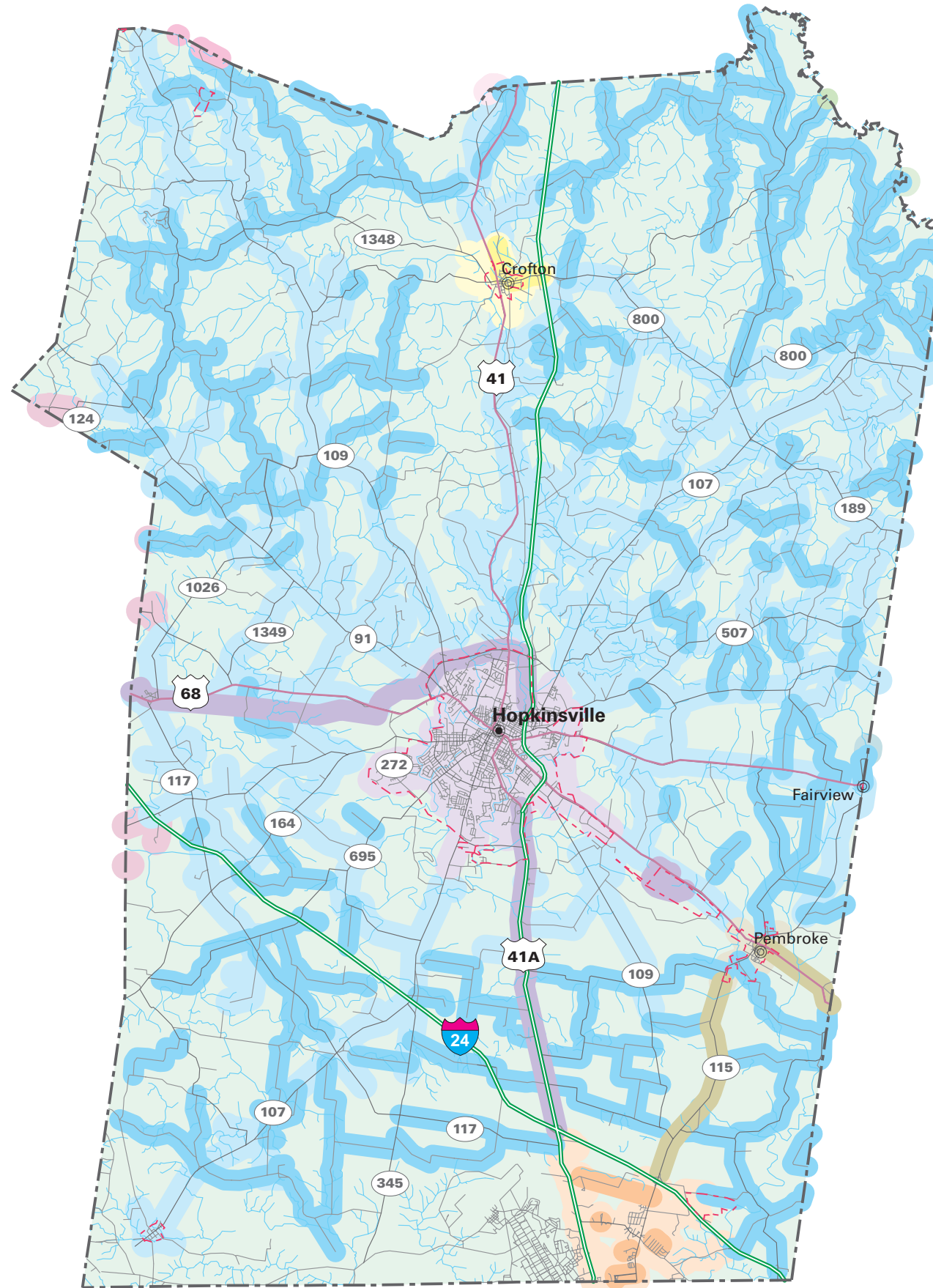
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WATER SERVICE STATUS BY OWNER

EXISTING SERVICE AREA	PROPOSED SERVICE AREA	OWNER
		TODD COUNTY WATER DISTRICT
		SOUTH HOPKINS WATER DISTRICT
		PEMBROKE WATER WORKS
		OAK GROVE WATER DEPARTMENT
		MUHLENBERG COUNTY WATER DISTRICT
		HOPKINSVILLE WATER ENVIRONMENTAL AUTHORITY
		CROFTON WATER DEPARTMENT
		CHRISTIAN COUNTY WATER DISTRICT
		BARKLEY LAKE WATER DISTRICT

PUBLIC WATER SYSTEMS

The residents of Christian County are presently provided water by five community systems-- 4 municipal and 1 water district. The community systems are the City of Pembroke with 370 customers, the City of Oak Grove with 2,337 customers, the Hopkinsville Water Environment Authority, which serves 13,200 customers, the City of Crofton with 681 customers; and the Christian County Water District with 3,265 customers.

PEMBROKE WATER WORKS

PWSID: 0240347
 System Type:..... COMMUNITY
 Owner Type:..... MUNICIPAL
 Surface Source:
 Purchase Source:
 Well Source: Yes
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 0.11
 Percent Daily Average Production: 97.00
 Total Tank Storage Capacity (gallons):..... 75,000.00
 Total Service Connections: 275.00
 Number of Employees:..... 0.00
 Treatment Operator Class:
 Distribution Operator Class: 2BD
 Customer Rate for 1,000 Gallons:..... Not available
 O/M costs 1997:..... Not available
 O/M costs per Service Connection: Not available
 Net Revenue 1997: Not available
 Total Water Produced 1997 (gallons):..... Not available
 Water Sold 1997 (gallons):..... Not available
 Unaccounted-for Water 1997 (%): Not available

The City of Pembroke utilizes two wells as its source of water and has a treatment plant with a capacity of 110,000 gallons per day. Utilization averages 107,000 gallons, which is near 100%. The Hopkinsville Water Environment Authority provides additional water to meet the peak days. Storage consists of one 75,000 gallon elevated storage tank.

Like many older distribution systems, Pembroke’s is in a bad state of repair. Water loss and non-revenue usage many times exceeds 50%, which is equal to or greater than total residential usage. Also, line sizes are inadequate to provide necessary flows in many areas of the City. Reducing the water losses would reduce the pressure on this City’s treatment plant; however, to purchase all treated water from HWEA without eliminating the water losses

would result in a serious financial situation for the City’s water and sewer department. Pembroke has 345 residential customers.

OAK GROVE WATER DEPARTMENT

PWSID: 0240329
 System Type:..... COMMUNITY
 Owner Type:..... MUNICIPAL
 Surface Source:.....HUNTER SPRING
 Purchase Source:
 Well Source:
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 0.52
 Percent Daily Average Production: 74.00
 Total Tank Storage Capacity (gallons):..... 1,250,000.00
 Total Service Connections: 2,331.00
 Number of Employees:..... 7.00
 Treatment Operator Class:.....2D
 Distribution Operator Class:3A
 Customer Rate for 1,000 Gallons:..... Not available
 O/M costs 1997:..... Not available
 O/M costs per Service Connection: Not available
 Net Revenue 1997: Not available
 Total Water Produced 1997 (gallons):..... Not available
 Water Sold 1997 (gallons):..... Not available
 Unaccounted-for Water 1997 (%): Not available

The City of Oak Grove utilizes Hunter’s Spring as its current source of water and has a short-term contract with Ft. Campbell for treated water to supplement their needs. The City’s treatment plant has a capacity of 518,000 gallons per day. Utilization has exceeded capacity on many occasions. Without the contract with Ft. Campbell, the city would have been in serious problems. The distribution system also has problems with volumes and pressure. Storage consists of one 250,000-gallon and two 500,000-gallon storage tanks plus 87,500-gallons clear well at its treatment facility. Currently, Oak Grove serves 2,224 households in the City, and the City is recognized as the fastest growing community in Kentucky, with new subdivisions and commercial enterprises constantly planned and under construction.

The Water Supply Plan recognizes the needs of Oak Grove for water. Projections in the plan for the year 2010 indicate demand will nearly double for water, making finding a solution to their problem even more critical. The City is looking at various options for solving their problems, including the construction of a new 1.5 million gallons per day treatment plant, purchasing water from the Hopkinsville Water Environment Authority, the City of

Clarksville, Tennessee, and the Lake Barkley Water District through the Christian County Water District.

HOPKINSVILLE WATER ENVIRONMENTAL AUTHORITY

PWSID: 0240201
 System Type:..... COMMUNITY
 Owner Type:..... WATER DISTRICT
 Surface Source:..... STONE QUARRY #1
 Purchase Source:
 Well Source:
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 10.00
 Percent Daily Average Production: 62.00
 Total Tank Storage Capacity (gallons):..... 6,750,000.00
 Total Service Connections: 13,213.00
 Number of Employees:..... 62.00
 Treatment Operator Class:.....3D
 Distribution Operator Class:4A
 Customer Rate for 1,000 Gallons:..... Not available
 O/M costs 1997:..... Not available
 O/M costs per Service Connection: Not available
 Net Revenue 1997: Not available
 Total Water Produced 1997 (gallons):..... Not available
 Water Sold 1997 (gallons):..... Not available
 Unaccounted-for Water 1997 (%): Not available

The Hopkinsville Water Environment Authority (HWEA) utilizes several sources of raw water. They include the North Quarry #1, South Quarry #2 and the North Fork of Little River. Also, as a secondary or contingency source, the Authority has four watershed lakes: Lake Blythe, Lake Morris, Lake Tandy and Lake Boxley. HWEA's treatment plant, which is relatively new, has a capacity of 10,000,000 gallons per day, with a utilization average of 6.2 million gallons per day and a peak rate of 7.2 million gallons per day. The water system has storage capacity of 6,750,000 gallons, which includes the clear well at the plant, three elevated tanks and one ground storage tank. The distribution system is in fairly good condition with water loss / non-revenue production of approximately 10%. Of the total 13,200 customers served by the system, 10,198 are residential, most of whom live within the corporate limits of the City. Also, HWEA sells water to the Christian County Water District, the City of Pembroke and is considering furnishing water to the City of Oak Grove. HWEA obviously has a problem with supply. According to the Christian County Water Supply Plan and information provided by its' staff, HWEA's supply during drought periods

has dropped below 90 days and at one point in 1998, it dropped to a 52-day supply. The Authority is proposing to run a 36-inch raw water line to Lake Barkley which, when completed, will provide the water necessary to meet HWEA's needs through 2050. To meet current as well as the future needs of the systems territory, projects have been selected and ranked by system representatives, elected officials and the Pennyrile Area Development District's Board of Directors as being crucial to the future growth and development of the region.

CROFTON WATER DEPARTMENT

PWSID: 0240090
 System Type:..... COMMUNITY
 Owner Type:..... MUNICIPAL
 Surface Source:.....LAKE MANIRE
 Purchase Source:
 Well Source:
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 0.25
 Percent Daily Average Production: 58.00
 Total Tank Storage Capacity (gallons):..... 100,000.00
 Total Service Connections: 613.00
 Number of Employees:..... 3.00
 Treatment Operator Class:.....2D
 Distribution Operator Class:2A
 Customer Rate for 1,000 Gallons:.....Not available
 O/M costs 1997:.....Not available
 O/M costs per Service Connection:Not available
 Net Revenue 1997:Not available
 Total Water Produced 1997 (gallons):.....Not available
 Water Sold 1997 (gallons):.....Not available
 Unaccounted-for Water 1997 (%):Not available

The City of Crofton's source of water is the Crofton Reservoir with Lake Manire as a back-up source. The treatment plant has a capacity of 250,000 gallons per day, with utilization of approximately 165,000 gallons (66% of the plant's total capacity). The water source is Crofton Lake. Storage consists of a clear well with a capacity of 50,000 gallons and a 100,000-gallon elevated tank. The distribution system has problems with water losses and non-revenue usage, which exceeds 21%. Also, because of small lines, volumes in some areas of the City are not what they should be. Crofton currently serves 650 households

CHRISTIAN COUNTY WATER DISTRICT

PWSID:.....	0240521
System Type:.....	COMMUNITY
Owner Type:.....	WATER DISTRICT
Surface Source:	
Purchase Source:	
Well Source:	
Sells Water to:	
Treatment Plant Capacity (MGD):.....	0.00
Percent Daily Average Production:	0.00
Total Tank Storage Capacity (gallons):.....	1,050,000.00
Total Service Connections:	3,189.00
Number of Employees:.....	7.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	
Customer Rate for 1,000 Gallons:.....	5.68
O/M costs 1997:.....	762,776.00
O/M costs per Service Connection:	236.74
Net Revenue 1997:	47,217.00
Total Water Produced 1997 (gallons):.....	0.00
Water Sold 1997 (gallons):.....	210,666,000.00
Unaccounted-for Water 1997 (%):	18.27

The Christian County Water District purchases water from the Hopkinsville Water Environmental Authority. Previously the District had purchased water from Lake Barkley Water District and the City of Crofton, but now they depend entirely on the Hopkinsville Water Environment Authority. The District continues to expand service into areas of the County that were not served previously. While currently serving 3,100 customers, projects are underway which increases the number served. Storage includes nine water tanks with a total capacity of 1,050,000 gallons of treated water.

The Christian County Water Supply Plan does project a growth in water usage of the District. To meet current as well as the future needs of the county, projects have been selected and ranked by Christian County system representatives, elected officials and the Pennyriple Area Development District’s Board of Directors as being crucial to the future growth and development of the region.

PRIVATE DOMESTIC SYSTEMS

About 9,300 people in Christian County rely on private domestic water supplies: 7,000 on wells and 2,300 on other sources.

In the southern half of Christian County more than three-quarters of the drilled wells in the uplands are adequate for a domestic supply. Yields as high as 50 gpm have been reported from wells penetrating large solution channels. In the low-lying areas of the West Fork of the Red River and the Little River and its major tributaries, most wells are inadequate for domestic use unless the well intercepts a major solution opening in the limestone in which the yield could be very large.

Ground water in the northern half of the county is not as prevalent as in the southern half of the county except in the area west of US 41 between Hopkinsville and Crofton. Most drilled wells in the western central section of the county that obtain water from fault zones are adequate for a domestic supply and sometimes yield up to 100 gpm. Most wells in the rest of the northern half of the county are inadequate for a domestic supply. Some wells in sandstone formations yield enough water for a domestic supply.

Springs with flows ranging from a few gallons per minute to 3,000 gpm are found in the county. Minimum flow generally occurs in early fall, maximum flows in late winter.

CRITTENDEN COUNTY

(Crittenden County Water Service Area Map)

- Estimated 1999 population of 9,350--70% on public water
- Estimated 2020 population of 8,950--91% on public water
- 185 miles of water lines, with plans for 250 additional miles
- Estimated funding needs for public water 2000-2005--\$10,326,000
- Estimated funding needs for public water 2006-2020--\$0

Crittenden County had an estimated population of 9,354 (3,955 households) in 1999 with a projected population of 8,955 (4,108 households) in 2020. Public water is provided to over 2,990 customers, or about 70 percent of the county's residents. In areas of the county not served by public water, about 5 of 8 households rely on private domestic wells and 3 of 8 households rely on other sources. About 870 households will be added to public water service through new line extensions in 2000-2020.

Estimated Costs - Proposed Projects, 2000-2005

COUNTY/System		New Customers		Rehab	Source	Treatment	Tanks/ Pumps	Total
	Miles	Number	Cost in \$1000	in \$1000	in \$1000	In \$1000	in \$1000	in \$1000
CRITTENDEN								
Crittenden/Lyon W/D	248	867	7,326				3,000	10,326
TOTAL	248	867	7,326				3,000	10,326

PUBLIC WATER SYSTEMS

Crittenden County residents are served by two public water systems, the City of Marion Water/Sewer System, which services 1,730 customers and the Crittenden-Livingston Water District which serves 1,260 customers in Crittenden County. The Marion Water and Sewer Department has 860,000 gallons per day treatment capacity. Total county storage capacity is 1,950,000 gallons.

MARION WATER DEPARTMENT

PWSID: 0280267
 System Type:..... COMMUNITY
 Owner Type: MUNICIPAL
 Surface Source:.....MARION OLD CITY LAKE
 Purchase Source:
 Well Source:
 Sells Water to:

WATER SERVICE AREAS CRITTENDEN COUNTY Kentucky

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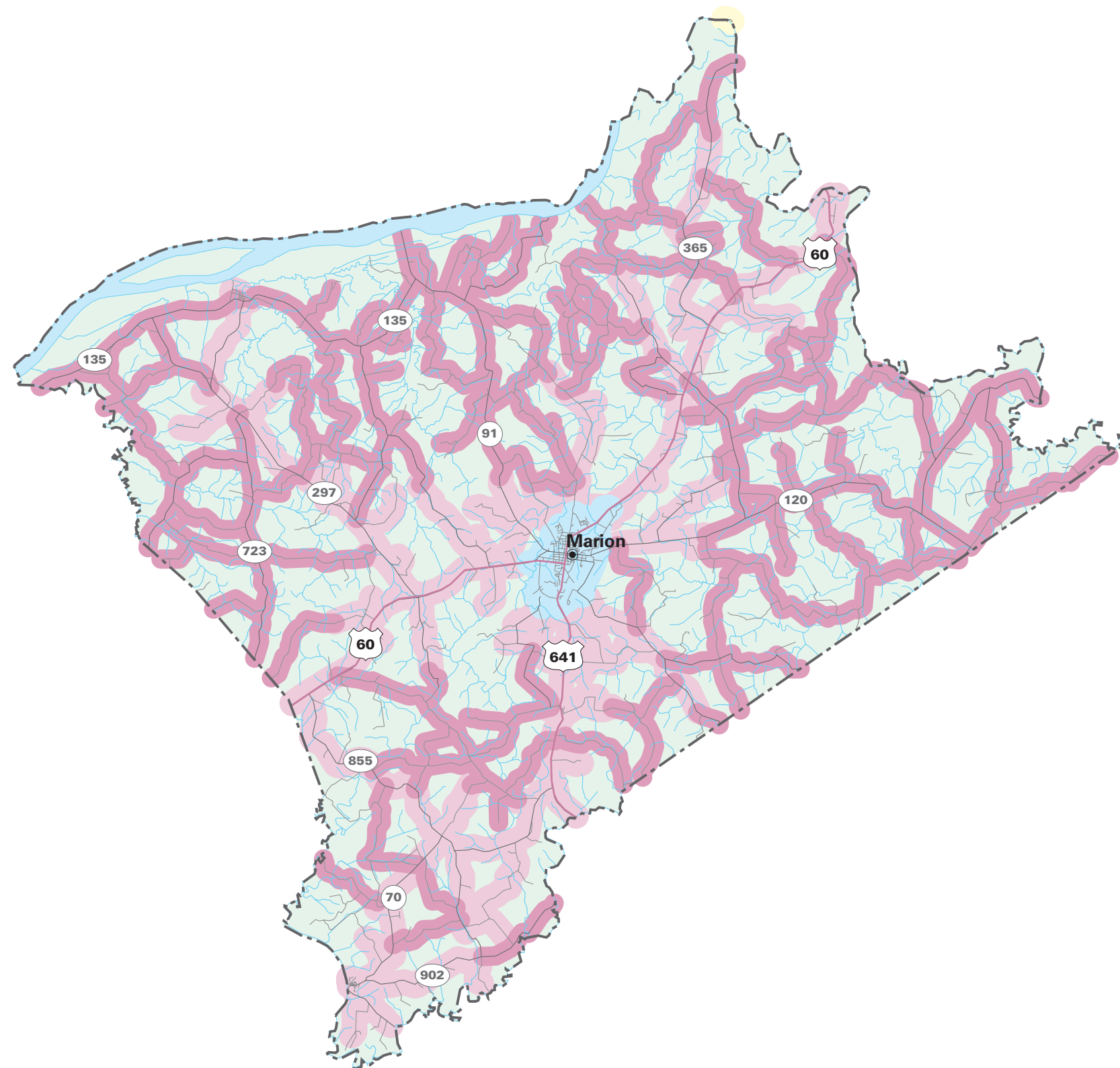
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WATER SERVICE STATUS BY OWNER

EXISTING SERVICE AREA	PROPOSED SERVICE AREA	OWNER
		STURGIS WATER WORKS
		MARION WATER DEPARTMENT
		CRITTENDEN-LIVINGSTON COUNTY WATER DISTRICT

Treatment Plant Capacity (MGD):.....	0.86
Percent Daily Average Production:	65.00
Total Tank Storage Capacity (gallons):.....	1,200,000.00
Total Service Connections:	1,730.00
Number of Employees:.....	4.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	3A
Customer Rate for 1,000 Gallons:.....	Not available
O/M costs 1997:.....	Not available
O/M costs per Service Connection:	Not available
Net Revenue 1997:	Not available
Total Water Produced 1997 (gallons):.....	Not available
Water Sold 1997 (gallons):.....	Not available
Unaccounted-for Water 1997 (%):	Not available

The City of Marion’s water source is two lakes—Lake George and City Lake located on the Crooked Creek Watershed. The water treatment plant, constructed during the early 1990’s, has a capacity of 864,000 gallons per day. Utilization presently averages over 61%. Storage consists of a clear well with a capacity of 266,000 gallons and two storage tanks with a total capacity of 1,200,000 gallons. The distribution system is remarkably tight, with water loss or non-revenue production of less than 2%. The City serves 1,730 customers (1,613 households), most of which live in the city limits. The City has an agreement with the Crittenden-Livingston Water District to draw treated water from one another in the event of an emergency. The Crittenden County Water Supply Plan indicates moderate growth for the City of Marion through the year 2010. Water usage will increase by approximately 20%. Factors not considered when the Water Supply Plan was written include two major expansions of Siemens and Par-4 Plastics, which may cause projections to change and create a larger demand for water.

CRITTENDEN-LIVINGSTON WATER DISTRICT

The Crittenden-Livingston Water District is located in Livingston County and is the only multi-county district in the Pennyrite. While other systems may serve customers in other counties, this is the only District organized and managed by a Board with representatives appointed by the respective fiscal courts of each county. The District presently has a 500,000-gallon per day water treatment plant, which is scheduled to be increased to 2.0 million gallons within the next year. With funds in place, the new plant will extend service to 100 households in Crittenden County and 200 households in Livingston County. In

addition, it will replace the water treatment plant in Smithland (Livingston County) and supplement and eventually replace treatment plants in Grand Rivers and the Ledbetter Water District. Currently, the District serves 1,260 customers in Crittenden County and 630 customers in Livingston County. The treatment plant is operating at 75% of capacity and on peak days near 90% of capacity. The plant's source of raw water is the Cumberland River, which is adequate to meet current and future needs. Storage consists of a clear well and three water tanks with total capacity of 750,000 gallons. The distribution system is relatively new, constructed in the early 1980's. According to the Water Supply Plan for Crittenden County, the existing water plant should be expanded in order to meet future needs. Plans are currently underway to meet this need. Engineers are completing the design and will be letting the contract for construction within the next few months. Although water coverage is quite thorough in Crittenden County part of the Crittenden/Livingston Water District territory, the Shady Grove area in the southwestern part of the county is currently without services. The system had gross revenue of \$600,725, operating and management cost of \$344,226 and net revenue of \$93,162 for the period 01/01/97-12/31/97. The charge for the first 5000 gallons of water was \$31.22. Overall system losses were 10.6% for the same period. Operating and management costs per service connection are \$182.

PRIVATE DOMESTIC SYSTEMS

About 2,800 people in Crittenden County rely on private domestic water supplies: 1,750 on wells and 1,050 on other sources.

On the northern edge of Crittenden County wells in the alluvium of the Ohio River Valley yield several hundred gallons per minute with compound horizontal wells having a potential yield as high as 5,000 gpm. In the western three-quarters of Crittenden County most of the drilled wells in the uplands are adequate for a domestic supply. Yields as high as 50 gpm have been reported from wells penetrating large solution channels or fault zones. In the low-lying areas of Claylick and Livingston Creeks and the tributaries to the Ohio River, most wells are inadequate for domestic use unless the well intercepts a major solution opening in the limestone in which the yield could be very large. Ground water in the sandstone and shale rich eastern quarter of the county is not as prevalent as in the rest of the county which is

predominately limestone. Most wells in the eastern part of the county are inadequate for a domestic supply, however some wells in sandstone formations yield enough water for a domestic supply when located in areas bordering streams.

Springs with flows ranging from a few gallons per minute to 1,400 gpm are found in the county. Minimum flow generally occurs in early fall, maximum flows in late winter.

HOPKINS COUNTY

(Hopkins County Water Service Area Map)

- Estimated 1999 population of 45,700--95% on public water
- Estimated 2020 population of 44,800--96% on public water
- 690 miles of water lines, with plans for 25 additional miles
- Estimated funding needs for public water 2000-2005--\$3,105,000
- Estimated funding needs for public water 2006-2020--\$0

Hopkins County had an estimated population of 45,683 (18,815 households) in 1999 with a projected population of 44,756 (19,795 households) in 2020. Public water is provided to over 18,500 households, or over 95 percent of the county's residents. In areas of the county not served by public water, about half rely on private domestic wells and half rely on other sources. About 140 households will be added to public water service through new line extensions in 2000-2020.

Estimated Costs - Proposed Projects, 2000-2005

COUNTY/System		New Customers		Rehab	Source	Treatment	Tanks/ Pumps	Total
	Miles	Number	Cost in \$1000	in \$1000	in \$1000	in \$1000	in \$1000	in \$1000
HOPKINS								-
South Hopkins W/D	32	106	584				425	1,009
North Hopkins W/D	4		120				338	458
Nebo	5	14	82					82
Mortons Gap				220			40	260
Nortonville	9	105	300					300
White Plains	2	3	28					28
Dawson Springs				225			500	725
Madisonville	1	19	47	31				78
Earlington	4		148	17				165
TOTAL	25	141	1,309	493			1,303	3,105

PUBLIC WATER SYSTEMS

The residents of Hopkins County are provided water services by ten water systems, three regional water districts and seven municipal systems. There is one private community system. The water districts are the South Hopkins Water District, the North Hopkins Water District and the Nebo Water District. All of the water districts purchase pre-treated water from other systems within the Pennyrile. Of the seven municipal systems, Dawson Springs, Earlington, Hanson, Madisonville, Mortons Gap, Nortonville and White Plains treat their own water and Hanson and Mortons Gap purchase treated water.

WATER SERVICE AREAS HOPKINS COUNTY Kentucky

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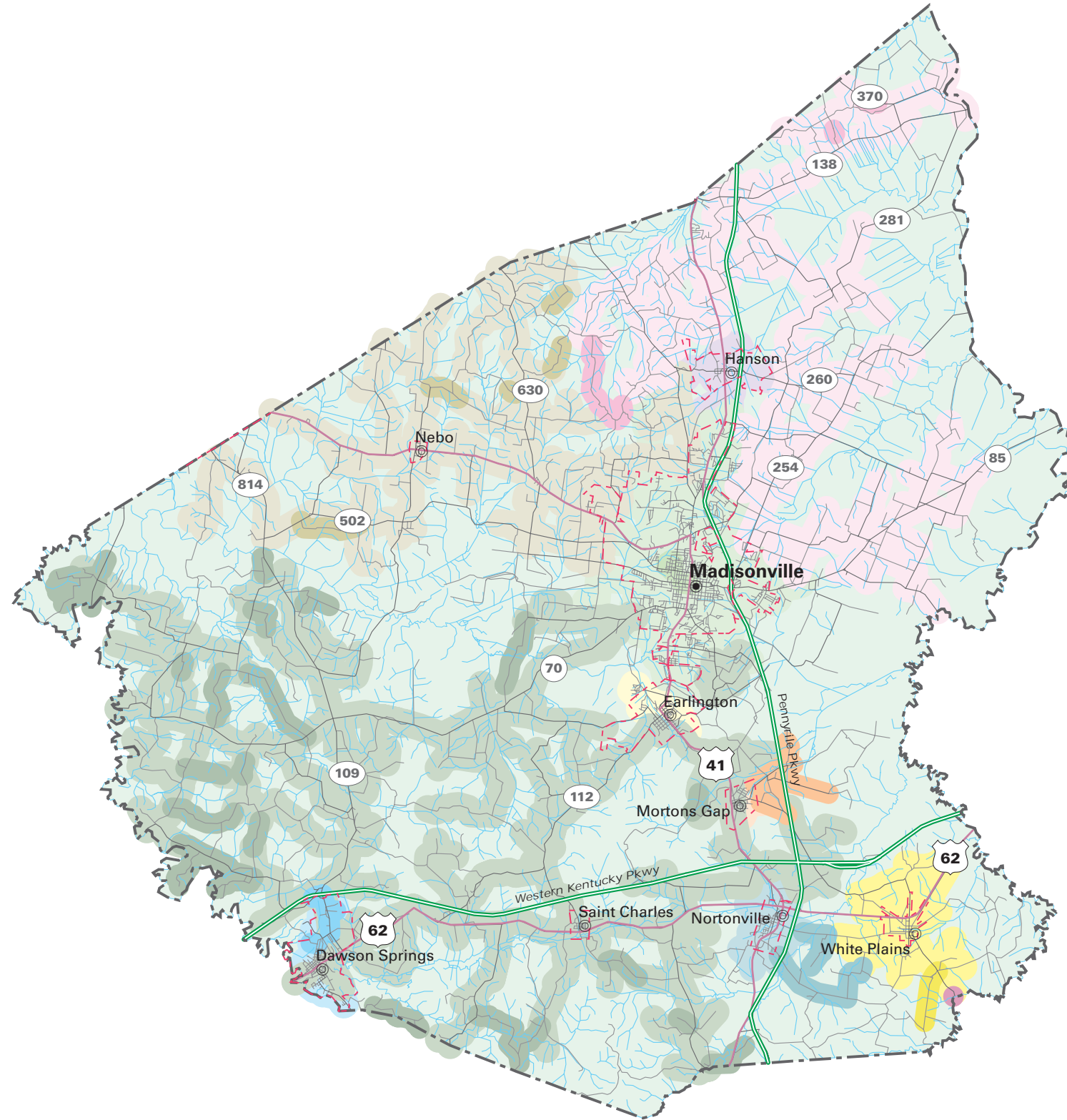
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WATER SERVICE STATUS BY OWNER

EXISTING SERVICE AREA	PROPOSED SERVICE AREA	OWNER
		WHITE PLAINS WATER SYSTEM
		SOUTH HOPKINS WATER DISTRICT
		NORTONVILLE WATER WORKS
		NORTH HOPKINS WATER DISTRICT
		NEBO WATER DISTRICT
		MORTONS GAP WATER DEPARTMENT
		MADISONVILLE LIGHT AND WATER
		HANSON WATER SYSTEM
		EARLINGTON WATER AND SEWER SYSTEM
		DAWSON SPRINGS WATER AND SEWER SYSTEM
		CHRISTIAN COUNTY WATER DISTRICT

SOUTH HOPKINS WATER DISTRICT

PWSID:.....	0540406
System Type:.....	COMMUNITY
Owner Type:.....	WATER DISTRICT
Surface Source:	
Purchase Source:	
Well Source:	
Sells Water to:	
Treatment Plant Capacity (MGD):.....	0.00
Percent Daily Average Production:	0.00
Total Tank Storage Capacity (gallons):.....	890,000.00
Total Service Connections:	2,642.00
Number of Employees:.....	6.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	
Customer Rate for 1,000 Gallons:.....	4.54
O/M costs 1997:.....	524,482.00
O/M costs per Service Connection:	199.12
Net Revenue 1997:	44,744.00
Total Water Produced 1997 (gallons):.....	0.00
Water Sold 1997 (gallons):.....	203,583,175.00
Unaccounted-for Water 1997 (%):	18.57

The South Hopkins Water District purchases treated water from the Cities of Dawson Springs and Madisonville at a cost of \$.9931 and \$1.61 per 1000 gallons, respectively. They currently service 2,642 customers; of those, 2,549 are residential, 81 commercial and 9 industrial. The district also sells water to the City of Mortons Gap and services approximately 102 customers that are located in Caldwell County.

The district has a total storage capacity of 889,000 gallons. This capacity is stored in 5 tanks located at various points within their service territory. On an average day the district utilizes approximately 560,000 gallons of water.

At present, the South Hopkins Water distribution system is considered to be in good condition, with adequate pressure and volume throughout the system to service its existing customer base. Overall system losses were 21% in 1997. However, according to the Hopkins County Water Supply Plan of 1995, the district water requirements will grow by at least 10% by the year 2010, which will increase its usage to an average of 616,000 gallons per day. Because of the growth that has taken place within the system and past system constraints there a several households that currently lack adequate services.

NORTH HOPKINS WATER DISTRICT

PWSID: 0540138
 System Type:..... COMMUNITY
 Owner Type:..... WATER DISTRICT
 Surface Source:
 Purchase Source:
 Well Source:
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 0.00
 Percent Daily Average Production: 0.00
 Total Tank Storage Capacity (gallons):..... 100,000.00
 Total Service Connections: 950.00
 Number of Employees:..... 2.00
 Treatment Operator Class:.....2D
 Distribution Operator Class:
 Customer Rate for 1,000 Gallons:..... 8.85
 O/M costs 1997:..... 192,747.00
 O/M costs per Service Connection: 205.05
 Net Revenue 1997: 29,582.00
 Total Water Produced 1997 (gallons):..... 0.00
 Water Sold 1997 (gallons):..... 50,641,000.00
 Unaccounted-for Water 1997 (%): 5.70

The North Hopkins Water District purchases treated water from the City of Madisonville at the cost of \$1.71 per 1000 gallons. They currently service 950 customers of those, 936 are residential, 10 commercial and 4 industrial. The district has a total storage capacity of 200,000 gallons, which is stored in two tanks. On an average day the district utilizes approximately 167,000 gallons of water or approximately 83.5% of its storage capacity.

According to the Hopkins County Water Supply Plan of 1995 the district water needs will grow by at least 10% by the year 2010 which will increase its usage to an average of 183,700 gallons per day or over 90% of their storage capacity. The territory serviced by the district is relatively well served with only a few sparsely scattered households without current service.

NEBO WATER DISTRICT

PWSID: 0540977
 System Type:..... COMMUNITY
 Owner Type:..... WATER DISTRICT
 Surface Source:
 Purchase Source:
 Well Source:
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 0.00
 Percent Daily Average Production: 0.00
 Total Tank Storage Capacity (gallons):..... 75,000.00
 Total Service Connections: 1,307.00

Number of Employees:.....	5.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	
Customer Rate for 1,000 Gallons:.....	5.17
O/M costs 1997:.....	309,791.00
O/M costs per Service Connection:.....	238.85
Net Revenue 1997:.....	12,401.00
Total Water Produced 1997 (gallons):.....	0.00
Water Sold 1997 (gallons):.....	81,790,000.00
Unaccounted-for Water 1997 (%):.....	5.97

The Nebo Water District purchases treated water from the City of Madisonville at the cost of \$1.71 per 1000 gallons. They currently service 1,290 customers of those, 1,269 are residential, 15 commercial and 6 industrial. The district has a total storage capacity of 375,000 gallons, which is stored in three tanks. On an average day the district utilizes approximately 262,000 gallons of water.

According to the Hopkins County Water Supply Plan of 1995 the district water requirements will grow by at least 9.6% by the year 2010 which will increase its usage to an average of 287,150 gallons per day. At present, the Nebo Water distribution system is considered to be in fairly good condition, with a few problems being caused by low pressure and low volume. The territory serviced by the district is relatively well served with only a few sparsely scattered households without current service.

MORTONS GAP WATER DEPARTMENT

PWSID:.....	0540269
System Type:.....	COMMUNITY
Owner Type:.....	MUNICIPAL
Surface Source:	
Purchase Source:	
Well Source:.....	Yes
Sells Water to:	
Treatment Plant Capacity (MGD):.....	0.00
Percent Daily Average Production:.....	0.00
Total Tank Storage Capacity (gallons):.....	200,000.00
Total Service Connections:.....	503.00
Number of Employees:.....	2.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	
Customer Rate for 1,000 Gallons:.....	4.02
O/M costs 1997:.....	Not available
O/M costs per Service Connection:.....	Not available
Net Revenue 1997:.....	Not available
Total Water Produced 1997 (gallons):.....	Not available
Water Sold 1997 (gallons):.....	Not available

Unaccounted-for Water 1997 (%):Not available

Mortons Gap Water Department purchases treated water from the South Hopkins Water District for \$1.48 per 1000 gallons. They currently serve 503 total customer of whom, 485 are residential and 18 are commercial. Residential customers of the system are currently charged \$20.13 for 5000 gallons of water. On an average day the system uses approximately 102,098 gallons of water. Currently the system has a total storage capacity of 200,000 gallons.

The Hopkins County Water Supply Plan of 1995 indicates that only 12.7% of the total water utilized annually are credited to loss or non-revenue categories, which is considered very good by industry standards. The distribution system of the Mortons Gap Water Department seems to be in good shape with the exception of several undersized lines that have experienced numerous leaks. The systems' storage tank is also in dire need of painting and cleaning. Although the Water Supply Plan indicates only modest growth for the city, there is an area just west of the systems boundaries that contains houses that aren't currently being served by any system

NORTONVILLE WATER WORKS

PWSID: 0540328
 System Type:..... COMMUNITY
 Owner Type: MUNICIPAL
 Surface Source:
 Purchase Source:
 Well Source:
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 0.43
 Percent Daily Average Production: 54.00
 Total Tank Storage Capacity (gallons):..... 270,000.00
 Total Service Connections: 902.00
 Number of Employees:..... 5.00
 Treatment Operator Class:
 Distribution Operator Class: 2BD
 Customer Rate for 1,000 Gallons:..... 3.15
 O/M costs 1997:Not available
 O/M costs per Service Connection:Not available
 Net Revenue 1997:Not available
 Total Water Produced 1997 (gallons):.....Not available
 Water Sold 1997 (gallons):.....Not available
 Unaccounted-for Water 1997 (%):Not available

The Nortonville Water Department gets its water from a series of wells that are located at various points within its territory. This water is then treated at its treatment facility, which has a limited design capacity of 432,000 gallons per day. On an average day they will withdraw and treat approximately 237,396 gallons of water or almost 55% of the plant's capacity. The water source is wells. This treatment process includes disinfecting, chlorinating and fluoridation. The department's storage system consists of two tanks and a wet well. The total storage capacity is 270,000 gallons. Nortonville currently serves 902 customers, of whom 849 are residential and 53 are categorized as commercial. Of these customers, some 300 live outside of the city limits of Nortonville. The typical residential customer of Nortonville is charged about \$15.75 for 5,000 gallons of water.

The Nortonville system has a rather large problem--low volume-- due to inadequate sized lines. In some areas there are six inch lines that run into two inch lines that meander into one inch lines and finally a three quarter inch line. In these situations the water volume is extremely low. The Hopkins County Water Supply Plan of 1995 indicated that Nortonville has experienced a 29.5% loss of water, which usually is an indication of leaks or inoperable meters. The Plan does not project significant growth for Nortonville, however there are several households just outside of the boundaries of the system that might be better served by Nortonville than by a water district. In order to service these households as well as others it will be necessary to replace some of the existing lines with newer and larger ones

WHITE PLAINS WATER SYSTEM

PWSID: 0540465
 System Type:..... COMMUNITY
 Owner Type:..... WATER DISTRICT
 Surface Source:
 Purchase Source:
 Well Source: Yes
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 0.00
 Percent Daily Average Production: 56.00
 Total Tank Storage Capacity (gallons):..... 120,000.00
 Total Service Connections: 500.00
 Number of Employees:..... 4.00
 Treatment Operator Class:
 Distribution Operator Class: 2BD
 Customer Rate for 1,000 Gallons:..... 4.35
 O/M costs 1997:..... Not available
 O/M costs per Service Connection: Not available

Net Revenue 1997:.....	Not available
Total Water Produced 1997 (gallons):.....	Not available
Water Sold 1997 (gallons):.....	Not available
Unaccounted-for Water 1997 (%):.....	Not available

The White Plains Water System gets its water from a series of wells that are located at various points within their territory. This water is then treated at its treatment facility, which has a limited design capacity of 120,000 gallons per day. On an average day they will withdraw and treat approximately 90,000 gallons of water, or around 75% of the plant's capacity. This treatment process includes disinfecting, chlorinating and fluoridation. The system's storage system consists of a tank and a wet well. The total storage capacity of the system is 120,000 gallons. White Plains currently serves 500 customers, of whom 490 are residential and 10 are categorized as commercial. Of this customer base about 205 reside outside the city limits of White Plains. The average residential customer of White Plains is charged approximately \$21.75 for 5000 gallons.

In recent years the distribution system has had major problems with leakage due to aged lines and also volume problems that result from lines that are too small. Another cause of major line breaks is the caving in of old abandoned mining shafts causing losses in excess of 20%. In recent years the City has attempted to replace many of the older lines within their system but many more need to be replaced.

According to the Hopkins County Water Supply Plan the city is projected to experience only slight growth but because of more recent developments the city is positioning itself for greater than projected growth. Developments like the installation of a natural gas system and the approval for the construction of a comprehensive sewer system will have tremendous impact on the growth of the City's population. Based on these development and other it is reasonable to assume that the existing water treatment facility may not be able to meet the future needs and the distribution system may need further upgrading

DAWSON SPRINGS WATER AND SEWER SYSTEM

PWSID:.....	0540958
System Type:.....	COMMUNITY
Owner Type:.....	MUNICIPAL
Surface Source:.....	LAKE BESHEAR
Purchase Source:	

Well Source:
 Sells Water to:

Treatment Plant Capacity (MGD):.....	2.88
Percent Daily Average Production:	40.00
Total Tank Storage Capacity (gallons):.....	2,100,000.00
Total Service Connections:	1,579.00
Number of Employees:.....	9.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	3A
Customer Rate for 1,000 Gallons:.....	5.92
O/M costs 1997:.....	Not available
O/M costs per Service Connection:	Not available
Net Revenue 1997:	Not available
Total Water Produced 1997 (gallons):.....	Not available
Water Sold 1997 (gallons):.....	Not available
Unaccounted-for Water 1997 (%):	Not available

The Dawson Springs system gets its raw water from Lake Breshear, located just south of the city limits. The system also operates their own treatment facility, which has a capacity of 2,880,000 gallons per day. Presently, the system uses approximately 1.1 million gallons per day or 38% of capacity. Along with the 1,579 customers, of which 1,438 are residential, 136 are commercial and 5 are industrial, the system also supplies water to the South Hopkins Water District. The calculated charge for 5,000 gallons of water to their residential customers is currently \$17.70, which when compared to other municipal systems within the Pennyrile is considered to be reasonable. The system’s water storage structure consists of four water storage tanks and a clear well that has a total storage capacity of 2,140,600 gallons

Dawson Springs, like many of the other systems in the Pennyrile has an abundance of problems that go along with dealing with an older system. The aged lines require constant leak repairs and some struggle with low-pressure areas and inadequate volume due to small waterlines. The Hopkins County Water Supply Plan of 1995 tells of water losses in excess of 22% which is the result of leaks and perhaps inoperable water meters. The Supply Plan also predicts growth within the city of approximately 24%, which should in turn create an increase demand for water to about the 1.35 million gallons per day level. Since this demand will probably not exceed 50% of the existing plant capacity, the city should be able to handle the increased demand. However, due to the age of the distribution system additional funds will be needed to adequately provide the most cost-effective service possible to the residents of Dawson Springs.

MADISONVILLE LIGHT AND WATER

PWSID:.....	0540936
System Type:.....	COMMUNITY
Owner Type:.....	MUNICIPAL
Surface Source:.....	PEE WEE LAKE
Purchase Source:	
Well Source:	
Sells Water to:	
Treatment Plant Capacity (MGD):.....	8.00
Percent Daily Average Production:	42.00
Total Tank Storage Capacity (gallons):.....	7,900,000.00
Total Service Connections:	10,387.00
Number of Employees:.....	16.00
Treatment Operator Class:.....	3D
Distribution Operator Class:	4A
Customer Rate for 1,000 Gallons:.....	2.99
O/M costs 1997:.....	Not available
O/M costs per Service Connection:	Not available
Net Revenue 1997:	Not available
Total Water Produced 1997 (gallons):.....	Not available
Water Sold 1997 (gallons):.....	Not available
Unaccounted-for Water 1997 (%):	Not available

The Madisonville Water System gets its water from three sources, the Green River, Lake Pee-Wee and City Lake. The raw water is then pumped to one of Madisonville’s two water treatment facilities. Treatment plant #1, the City Park Facility has a treatment capacity of 1.5 million gallons per day and gets its water from the City Lake. Treatment Plant #2, the Lake PeeWee Treatment Facility has a capacity of 8.0 million gallons per day and is supplied by Green River via Lake PeeWee. On an average day the two treatment facilities treat only 3,730,764 gallons or less than 40% of their capacity. The Madisonville Storage system is made up of four tanks located at various points within its territory and two clear wells located at each of its treatment facilities. The total storage capacity of the system is 7,875,000 gallons. The Madisonville system serves 10,387 customers, of whom 9,339 are residential and 1,048 are categorized as commercial. Along with servicing the residents of the city, approximately 1100 of its’ customer base resides in the county. The price charged to residential customers for 5,000 gallons of water is \$14.94.

The distribution system has very few inadequate line sizes, so volume and pressure concerns are minimal. However, according to the Hopkins County Water Supply Plan of 1995, Madisonville has 31.5% of its annual usage categorized as non-revenue water loss, which more than doubles the standard rate (15%). The Plan also projects the future growth in

demand for water in the systems' territory to grow by upwards of 38% which will cause for some upgrading of the distribution system. Although the city has taken major step in recent years to reduce its loss, by replacing aged water lines and eliminating inoperable meters, because of these and other factors there is still much upgrading to be done.

EARLINGTON WATER AND SEWER SYSTEM

PWSID:.....	0540108
System Type:.....	COMMUNITY
Owner Type:.....	MUNICIPAL
Surface Source:.....	LOCH MARY LAKE
Purchase Source:	
Well Source:	
Sells Water to:	
Treatment Plant Capacity (MGD):.....	0.50
Percent Daily Average Production:	28.00
Total Tank Storage Capacity (gallons):.....	278,000.00
Total Service Connections:	730.00
Number of Employees:.....	3.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	2A
Customer Rate for 1,000 Gallons:.....	2.92
O/M costs 1997:.....	Not available
O/M costs per Service Connection:	Not available
Net Revenue 1997:.....	Not available
Total Water Produced 1997 (gallons):.....	Not available
Water Sold 1997 (gallons):.....	Not available
Unaccounted-for Water 1997 (%):	Not available

The Earlington Water and Sewer system gets its raw water from the Loch Mary Reservoir that is located on the outer edge of the city limits. The system also operates their own treatment facility, which has a capacity of 500,000 gallons per day. Presently, the system uses approximately 130,000 gallons per day or 26% of capacity. The system has a total water storage capacity of 400,000 gallons. The system currently services 778 customers, of whom 774 are residential and 4 are commercial. The calculated charge for 5,000 gallons of water to their residential customers is \$14.60, which is one of the lowest charges in the Pennyrile.

Earlington, unlike many of the other systems in the Pennyrile has had the opportunity to almost completely replace all of the lines of their distribution system with new PVC lines. The Hopkins County Water Supply Plan of 1995 tells of water losses in excess of 29.8%, the result of leaks and perhaps inoperable water meters. Now due to the updates the water loss

has been lowered to below the acceptable 15% level. Even with the practically new distribution system the system is still in need of some assistance

HANSON WATER SYSTEM

PWSID: 0540656
 System Type:..... COMMUNITY
 Owner Type:..... MUNICIPAL
 Surface Source:
 Purchase Source:
 Well Source:
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 0.00
 Percent Daily Average Production: 0.00
 Total Tank Storage Capacity (gallons):..... 150,000.00
 Total Service Connections: 430.00
 Number of Employees:..... 4.00
 Treatment Operator Class:..... 1D
 Distribution Operator Class:
 Customer Rate for 1,000 Gallons:..... 4.42
 O/M costs 1997:..... Not available
 O/M costs per Service Connection: Not available
 Net Revenue 1997: Not available
 Total Water Produced 1997 (gallons):..... Not available
 Water Sold 1997 (gallons):..... Not available
 Unaccounted-for Water 1997 (%): Not available

The Hanson Water System purchases treated water from the City of Madisonville at the cost of \$1.54 per 1000 gallons. They currently service 430 customers of those, 414 are residential, and 14 commercial and 2 are industrial or other. The system has a total storage capacity of 150,000 gallons, which is stored in two tanks. On an average day the customers of Hanson utilize approximately 75,000 gallons of water. The calculated charge for 5,000 gallons of water to their residential customers is currently \$22.10, which when compared to other systems within the Pennyriple is considered to be reasonable.

At present, the Hanson distribution system is considered to be in fairly good condition, with a few problems being caused by leaks and malfunctioning meters, low pressure and low volume. According to the Hopkins County Water Supply Plan of 1995 the system's territorial population growth will be minimal by the Year 2010. However it should be noted that with the location of a 120 bed Veterans Nursing facility (with 156 employees) and Carhart's new 300 employee distribution Center, the water consumption is projected to increase by 33,000 gallons per day. To accommodate this growth, the City has constructed a

500,000-gallon water storage tank, and additional projects are in the process of being completed. At this time, the superintendent has determined that the system (after the current projects are complete) will not have any needs that are beyond the scope of the routine maintenance that will be completed with generated income.

OTHER SYSTEMS

HOPKINS CO COAL/ISLAND MINE

Hopkins Co Coal/Island Mine is located in Hopkins County. The system serves a population of 90 and has 1 service connection. The private, community system's water is purchased from Madisonville.

PRIVATE DOMESTIC SYSTEMS

About 2,000 people in Hopkins County rely on private domestic water supplies: 1,000 on wells and 1,000 on other sources.

In Hopkins County most wells, which penetrate sandstone's from depths of less than 300 feet are adequate for a domestic supply. In the areas surrounding Nortonville and south of Richland, most wells produce less than 100 gallons per day at depths of less than 300 feet. In southwestern Hopkins County, south of Charleston, a thin highly faulted zone running east-west yields unpredictable amounts of water to drilled wells.

Generally, ground water is hard and sometimes iron or salt may be present in objectionable amounts. Often ground water becomes saltier with depth north of the highly faulted zone.

LIVINGSTON COUNTY

(Livingston County Water Service Area Map)

- Estimated 1999 population of 9,300--80% on public water
- Estimated 2020 population of 9,300--90% on public water
- 155 miles of water lines, with plans for 110 additional miles
- Estimated funding needs for public water 2000-2005--\$3,753,000
- Estimated funding needs for public water 2006-2020--\$0

Livingston County had an estimate population of 9,339 (4,025 households) in 1999 with a projected population of 9,252 (4,398 households) in 2020. Public water is provided to over 3,200 households, or 82 percent of the county's residents. In areas of the county not served by public water, about 5 of 8 households rely on private domestic wells and 3 of 8 rely on other sources. Nearly 460 households will be added to public water service through new line extensions in 2000-2020.

Estimated Costs - Proposed Projects, 2000-2005

COUNTY/System		New Customers		Rehab	Source	Treatment	Tanks/ Pumps	Total
	Miles	Number	Cost in \$1000	in \$1000	in \$1000	in \$1000	in \$1000	in \$1000
LIVINGSTON								-
Crittenden/Livingston W/D	86	298	2,706					2,706
Ledbetter	1		10	7				17
Grand River	23	151	645					645
Smithland	2	12	37	53				90
Salem							295	295
TOTAL	112	461	3,398	60			295	3,753

PUBLIC WATER SYSTEMS

The residents of Livingston County are presently provided water service by five different water systems: the cities of Grand Rivers, Smithland, and Salem, the Ledbetter Water District and the Crittenden-Livingston Water District.

CRITTENDEN-LIVINGSTON COUNTY WATER DISTRICT

PWSID: 0700532
 System Type:..... COMMUNITY
 Owner Type:..... WATER DISTRICT
 Surface Source:..... CUMBERLAND RIVER
 Purchase Source:
 Well Source:
 Sells Water to:

WATER SERVICE AREAS LIVINGSTON COUNTY Kentucky

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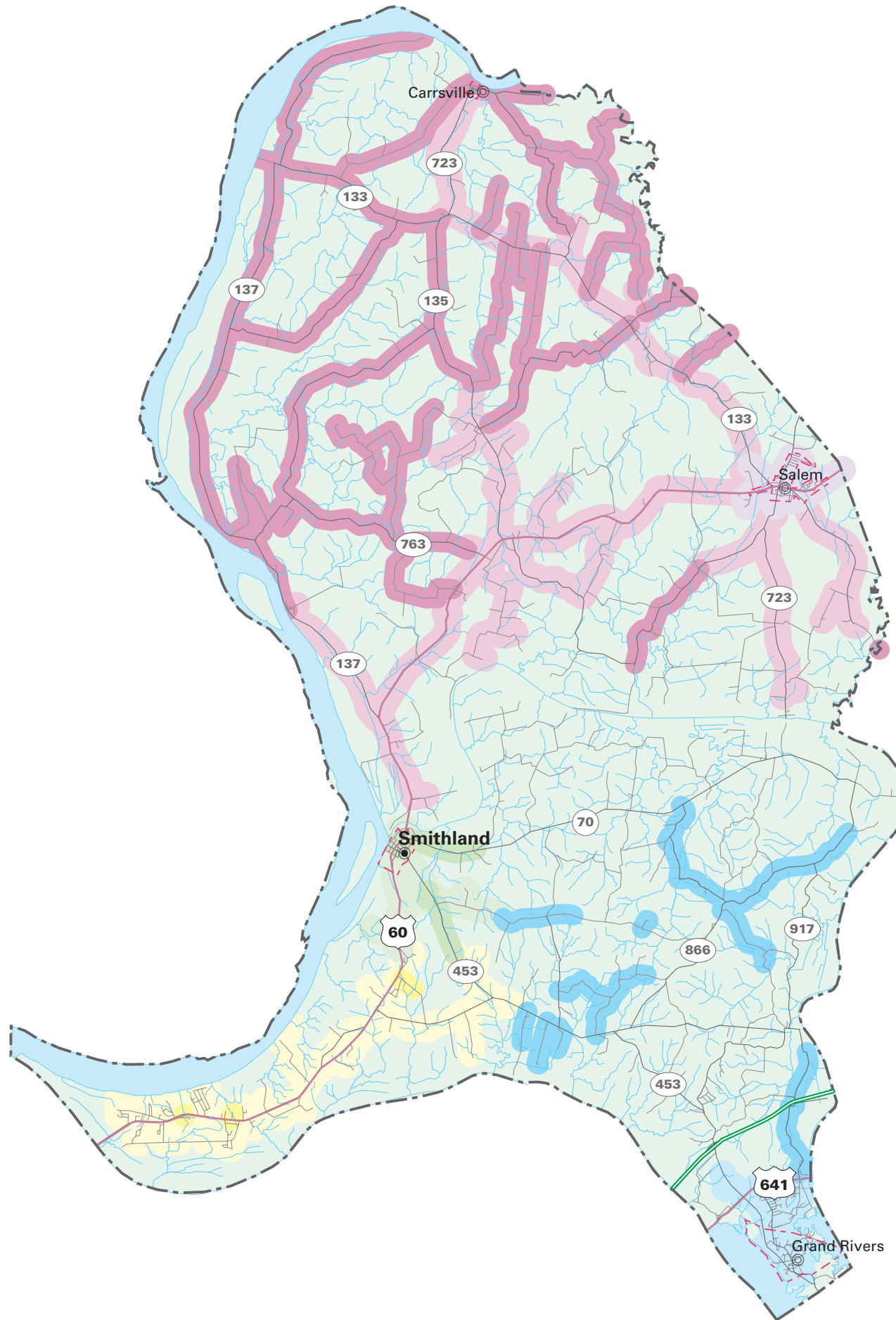
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WATER SERVICE STATUS BY OWNER

EXISTING SERVICE AREA	PROPOSED SERVICE AREA	OWNER
		SMITHLAND WATER AND SEWER SYSTEM
		SALEM MUNICIPAL WATER SYSTEM
		LEDBETTER WATER DISTRICT
		GRAND RIVERS WATER SYSTEM
		CRITTENDEN-LIVINGSTON COUNTY WATER DISTRICT

Treatment Plant Capacity (MGD):.....	0.50
Percent Daily Average Production:	75.00
Total Tank Storage Capacity (gallons):.....	750,000.00
Total Service Connections:	1,892.00
Number of Employees:.....	0.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	3A
Customer Rate for 1,000 Gallons:.....	8.11
O/M costs 1997:.....	324,539.00
O/M costs per Service Connection:	173.09
Net Revenue 1997:	78,405.00
Total Water Produced 1997 (gallons):.....	128,245,000.00
Water Sold 1997 (gallons):.....	94,770,000.00
Unaccounted-for Water 1997 (%):	10.62

The Crittenden-Livingston Water District serves 630 households in Livingston County. The water plant, which also serves 120 households in Crittenden County, is located at Pickneyville on the Cumberland River, which is its source of water. The plant’s capacity is 500,000 gallons per day and is presently operating at approximately 75% of its capacity. Storage consists of three tanks and a clear well with 750,000 gallons storage capacity. Of the three tanks, one is located in Livingston County, as well as the clear well that gives 300,000 gallons of storage in Livingston County. The distribution system is in good condition, although water loss or non-revenue production is around 25% that are higher than it should be.

The District is presently in the process of a major expansion, which would provide services to 200 additional residents in Livingston County by crossing the Cumberland River at Pickneyville and serving the Tiline area. Also, the project includes expansion of the water treatment plant to 2.0 million gallons per day in order to serve Smithland (eliminating the water plant at Smithland) and providing supplemental service to Grand Rivers and the Ledbetter Water District. It is anticipated that in the near future this plant will be the sole source of treated water for all of Livingston and Crittenden counties. The District is expected to grow according to the Water Supply Plan as a result of the construction of another lock in Kentucky Dam (\$500 million) and the extension of lines to serve other areas in the county. Growth in usage is expected to exceed 38% through 2010. Currently, the water line coverage in the District’s service territory is less than 50%. Projects have been compiled to extend water lines to those areas that are currently not being served and other under-served areas.

LEDBETTER WATER DISTRICT

PWSID:.....	0700243
System Type:.....	COMMUNITY
Owner Type:.....	WATER DISTRICT
Surface Source:	
Purchase Source:	
Well Source:	
Sells Water to:	
Treatment Plant Capacity (MGD):.....	0.30
Percent Daily Average Production:	64.00
Total Tank Storage Capacity (gallons):.....	300,000.00
Total Service Connections:	1,050.00
Number of Employees:.....	6.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	2A
Customer Rate for 1,000 Gallons:.....	4.12
O/M costs 1997:.....	185,430.00
O/M costs per Service Connection:	182.69
Net Revenue 1997:	14,914.00
Total Water Produced 1997 (gallons):.....	68,277,400.00
Water Sold 1997 (gallons):.....	59,228,118.00
Unaccounted-for Water 1997 (%):	4.61

The Ledbetter Water District’s source of water is a well field located north of US 60 near the Ohio River. The quality of the water is a problem in that, like Smithland, it has a high iron content. The water treatment plant has a capacity of 300,000 gallons per day and at times usage has required purchasing water from Grand Rivers. The District has plans to purchase from the Crittenden-Livingston Water District when their expansion is completed and will eventually purchase all their water from that source. Storage consists of a clear well and two tanks with a total storage capacity of 300,000 gallons. Ledbetter serves 1,050 customers, which includes 1,008 residential households.

The distribution system, while relatively new, does have some areas with inadequate flows that need replacement. Ledbetter, due to its location along US 60 near Paducah, is experiencing a substantial growth. New developments (golf course and residential area) are under construction and will create growth and water usage. The Water Supply Plan indicates growth of 10% through the year 2010. However, with the new developments underway, the availability of sewer service now administered by the District, a projected growth of 30% through the year 2010 is possible, creating an even greater demand for water. Projects have been proposed to meet the anticipated increase in demand as well as to further enhance the system's ability to economically service its existing customer base.

GRAND RIVERS WATER SYSTEM

PWSID:.....	0700162
System Type:.....	COMMUNITY
Owner Type:.....	MUNICIPAL
Surface Source:.....	KENTUCKY LAKE
Purchase Source:	
Well Source:	
Sells Water to:	
Treatment Plant Capacity (MGD):.....	0.30
Percent Daily Average Production:	99.00
Total Tank Storage Capacity (gallons):.....	400,000.00
Total Service Connections:	1,037.00
Number of Employees:.....	6.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	2A
Customer Rate for 1,000 Gallons:.....	Not available
O/M costs 1997:.....	Not available
O/M costs per Service Connection:	Not available
Net Revenue 1997:	Not available
Total Water Produced 1997 (gallons):.....	Not available
Water Sold 1997 (gallons):.....	Not available
Unaccounted-for Water 1997 (%):	Not available

The City of Grand Rivers receives its raw water from Kentucky Lake. The plant, which has a capacity of 300,000 per day, is operating at nearly 100% of its capacity. In order to meet their needs, water is purchased from the North Marshall Water District through a temporary line across Kentucky Dam. Future plants to construct a new lock in the Kentucky Dam will disrupt that service. For that reason, Grand Rivers will purchase treated water from Crittenden-Livingston Water District and eventually eliminate the water treatment plant that is in need of major expansion and improvement. The City has adequate storage with three tanks and a clear well for a total capacity of 400,000 gallons

The City’s distribution system is in relatively good condition with line sizes adequate to meet local needs. The system serves 1,037 customers with 937 residential households, including Lake City residents whose water district dissolved and merged with the Grand Rivers system. The Livingston County Water Supply Plan indicates growth of 20% through the year 2010 due to normal growth. With the construction of the additional lock in Kentucky Dam and the 700 workers expected to move in to work on the project, the growth may exceed those projections significantly.

SMITHLAND WATER AND SEWER SYSTEM

PWSID:.....	0700401
System Type:.....	COMMUNITY
Owner Type:.....	MUNICIPAL
Surface Source:	
Purchase Source:	
Well Source:	
Sells Water to:	
Treatment Plant Capacity (MGD):.....	0.14
Percent Daily Average Production:	49.00
Total Tank Storage Capacity (gallons):.....	194,000.00
Total Service Connections:	304.00
Number of Employees:.....	0.00
Treatment Operator Class:.....	1D
Distribution Operator Class:	2A
Customer Rate for 1,000 Gallons:.....	Not available
O/M costs 1997:.....	Not available
O/M costs per Service Connection:	Not available
Net Revenue 1997:	Not available
Total Water Produced 1997 (gallons):.....	Not available
Water Sold 1997 (gallons):.....	Not available
Unaccounted-for Water 1997 (%):	Not available

The City of Smithland obtains its raw water from two wells located about 200 feet from the Cumberland River. The source is a problem in that the water has a high iron content that causes discoloration and creates complaints by residents in the City. The treatment plant (constructed in 1970) is operating near capacity and needs several improvements. Even so, it cannot adequately treat the iron. The distribution system has many problems due to lines constructed in the 1950s and in need of replacement. The city serves 304 customers including 261 households. Storage consists of two tanks and a clear well with 194,000 gallons total storage. Loss of water or non-revenue production exceeds 32% of the total produced, an indication of the poor condition of the distribution system.

The Smithland Water Plant will be replaced and taken out of operation when the Crittenden-Livingston Water Plant goes on-line in the year 2000. The Water Supply Plan does not indicate any substantial growth for Smithland's water system due to the limited area within their service area and the Ledbetter Water District to the West and Crittenden-Livingston Water District to the south and east of the City. Priorities for Smithland are related to improvements to the distribution system to include new and larger lines.

SALEM MUNICIPAL WATER SYSTEM

PWSID:.....	0700380
System Type:.....	COMMUNITY
Owner Type:.....	MUNICIPAL
Surface Source:	
Purchase Source:	
Well Source:	Yes
Sells Water to:	
Treatment Plant Capacity (MGD):.....	0.00
Percent Daily Average Production:	0.00
Total Tank Storage Capacity (gallons):.....	0.00
Total Service Connections:	429.00
Number of Employees:.....	0.00
Treatment Operator Class:.....	1D
Distribution Operator Class:	
Customer Rate for 1,000 Gallons:.....	Not available
O/M costs 1997:.....	Not available
O/M costs per Service Connection:	Not available
Net Revenue 1997:	Not available
Total Water Produced 1997 (gallons):.....	Not available
Water Sold 1997 (gallons):.....	Not available
Unaccounted-for Water 1997 (%):	Not available

The City of Salem purchases treated water from the Crittenden-Livingston Water District, but maintains their distribution system. Customers served by the City total 429, including 385 households. The distribution system is in relatively good condition with a loss or non-revenue usage of approximately 18%, and line sizes are reportedly adequate throughout the City. Crittenden-Livingston Water District provides the necessary storage.

As an agricultural area, Salem has not seen any major changes in population and water usage has been relatively the same. According to the Water Supply Plan, usage will increase approximately 5% through 2010.

Other Systems

MARTIN MARIETTA MATERIALS INC.

Martin Marietta Materials Inc. is located in Livingston County. The private, non-transient, non-community system has a storage capacity of 800,000 gallons. The water is purchased form from City of Smithland Water System.

PRIVATE DOMESTIC SYSTEMS

About 1,800 people in Livingston County rely on private domestic water supplies: 1,100 on wells and 700 on other sources.

On the northern and western edge of Livingston County wells in the alluvium of the Ohio River Valley yield several hundred gallons per minute with compound horizontal wells having a potential yield as high as 5,000 gpm. In most of Livingston County drilled wells in the uplands are adequate for a domestic supply. Yields as high as 50 gpm have been reported from wells penetrating large solution channels or fault zones. In the low-lying areas along the Cumberland and Tennessee Rivers and the tributaries to the Ohio River, most wells are inadequate for domestic use unless the well intercepts a major solution opening in the limestone in which the yield could be very large. In the uplands of the southern section of the county between the Tennessee and Cumberland Rivers most wells in gravel do not yield enough water for a domestic supply.

Springs with flows ranging from a few gallons per minute to 177 gpm are found in the county. Minimum flow generally occurs in early fall, maximum flows in late winter.

LYON COUNTY

(Lyon County Water Service Area Map)

- Estimated 1999 population of 6,800--over 85% on public water
- Estimated 2020 population of 7,300--over 88% on public water
- 170 miles of water lines, with plans for 30 additional miles
- Estimated funding needs for public water 2000-2005--\$4,795,000
- Estimated funding needs for public water 2006-2020--\$0

Lyon County had an estimated population of 6,780 (3,090 households) in 1999 with a projected population of 7,340 (3,445 households) in 2020. Public water is provided to 3,150 customers, or 85-90 percent of the county's residents. In areas of the county not served by public water, about 7 of 8 households rely on private domestic wells and 1 of 8 rely on other sources. 120 households will be added to public water service through new line extensions in 2000-2020.

Estimated Costs - Proposed Projects, 2000-2005

COUNTY/System		New Customers		Rehab	Source	Treatment	Tanks/ Pumps	Total
	Miles	Number	Cost in \$1000	in \$1000	in \$1000	in \$1000	in \$1000	in \$1000
LYON								-
Lyon Co. W/D	30	120	795					795
Eddyville						4,000		4,000
TOTAL	30	120	795			4,000		4,795

PUBLIC WATER SYSTEMS

The residents of Lyon County are primarily provided water by three systems, the Lyon County Water District, the City of Kuttawa Water System and the City of Eddyville Water Department. Additionally, the Barkley Lake Water District serves approximately 75 residents in Lyon County and the Kentucky State Penitentiary has its own system that serves the inmates.

LYON COUNTY WATER DISTRICT

PWSID: 0720933
 System Type:..... COMMUNITY
 Owner Type:..... WATER DISTRICT
 Surface Source:
 Purchase Source:
 Well Source:

WATER SERVICE AREAS

LYON COUNTY

Kentucky

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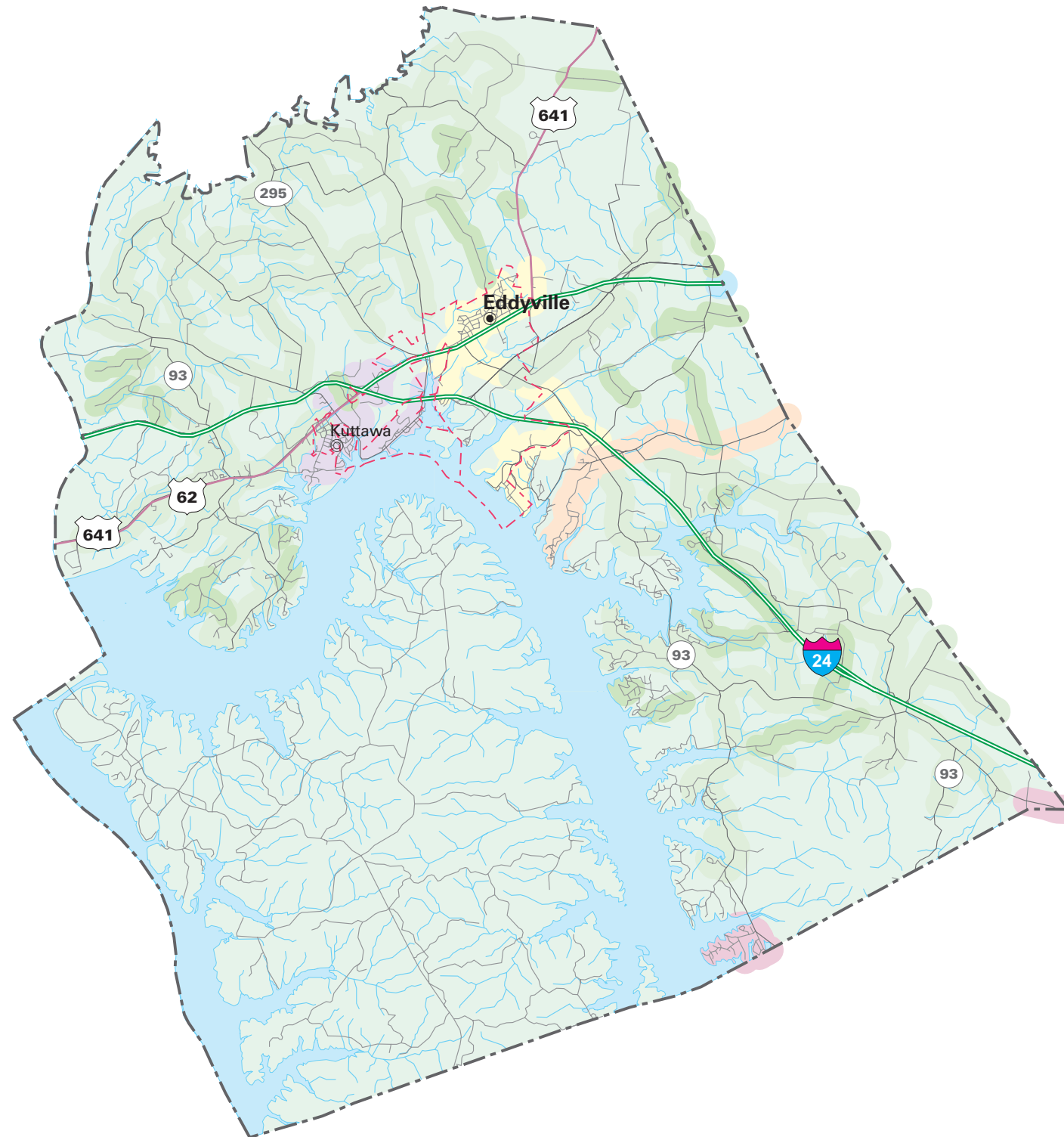
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WATER SERVICE STATUS BY OWNER

EXISTING SERVICE AREA	PROPOSED SERVICE AREA	OWNER
		PRINCETON WATER & WASTEWATER COMMISSION
		LYON COUNTY WATER DISTRICT
		KUTTAWA WATER SUPPLY
		EDDYVILLE WATER DEPARTMENT
		CALDWELL COUNTY WATER DISTRICT
		BARKLEY LAKE WATER DISTRICT

Sells Water to:	
Treatment Plant Capacity (MGD):.....	0.00
Percent Daily Average Production:	0.00
Total Tank Storage Capacity (gallons):.....	475,000.00
Total Service Connections:	1,455.00
Number of Employees:.....	3.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	
Customer Rate for 1,000 Gallons:.....	5.87
O/M costs 1997:.....	295,101.00
O/M costs per Service Connection:	210.19
Net Revenue 1997:	69,414.00
Total Water Produced 1997 (gallons):.....	0.00
Water Sold 1997 (gallons):.....	72,668.00
Unaccounted-for Water 1997 (%):	2.49

The Lyon County Water District purchases its water from both the cities of Eddyville and Kuttawa and additionally has a contract with the city of Princeton who serves as a back-up source. The district services a total of 1,468 customers, of which 17 reside in the adjacent Caldwell County. On an average day the system pumps approximately 199,000 gallons of treated water through its system.

According to the Phase 1 Lyon County Water Supply study completed in 1995, the water usage in the Lyon County Water District territory is projected to grow by over 21% by the year 2010.

EDDYVILLE WATER DEPARTMENT

PWSID:	0720113
System Type:.....	COMMUNITY
Owner Type:.....	MUNICIPAL
Surface Source:.....	LAKE BARKLEY
Purchase Source:	
Well Source:	
Sells Water to:	
Treatment Plant Capacity:.....	1.50
Percent Daily Average Production:	33.00
Total Tank Storage Capacity:.....	800,000.00
Total Service Connections:	1,300.00
Number of Employees:.....	3.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	2A
Customer Rate for 1,000 Gallons:.....	NA
O/M costs 1997:.....	NA
O/M costs per Service Connection:	NA
Net Revenue 1997:	NA
Total Water Produced 1997:.....	NA
Water Sold 1997:.....	NA

Unaccounted-for Water 1997:..... NA

The City of Eddyville Water Department has a new 1,500,000-gallon per day water treatment facility which serves 1,301 customers in Eddyville, 325 customers in Fredonia (Caldwell County) and 1,468 customers of the Lyon County Water District. The City's present source of water is three wells; plans exist to construct an intake in Lake Barkley to replace the wells. The new 1,500,000-gallon water treatment plant is operating at 33 1/3% capacity. Storage consists of three tanks and a clear well with a total storage capacity of approximately 800,000 gallons. The City's distribution system is in good condition with water loss or non-revenue usage of 12.3%, which is considered very good.

Eddyville has experienced remarkable growth during the past 10 years due to their location in respect to the lakes, access to I-24 and West Kentucky Parkway, and the development of a large discount shopping mall which has provided employment as well as other retail outlets. In addition, due to their location in respect to the forenamed highways, the City has developed an industrial spec building on the 100-acre, fully developed industrial park to attract industry. According to the Lyon County Water Supply Plan, Eddyville's water usage is expected to increase 20% through 2010. Based upon the present volume of water used and the projections through the year 2010, Eddyville's water treatment plant can handle the growth provided a new raw water intake is constructed into Lake Barkley, and the three wells now used as the source be abandoned. This project is now in the planning stage, and the new plant is designed to handle Barkley Lake water.

KUTTAWA WATER SUPPLY

PWSID: 0720227
 System Type:..... COMMUNITY
 Owner Type:..... MUNICIPAL
 Surface Source:..... LAKE BARKLEY
 Purchase Source:
 Well Source:
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 0.75
 Percent Daily Average Production: 35.00
 Total Tank Storage Capacity (gallons):..... 650,000.00
 Total Service Connections: 410.00
 Number of Employees:..... 1.00
 Treatment Operator Class: 1D
 Distribution Operator Class: 3A
 Customer Rate for 1,000 Gallons:..... Not available

O/M costs 1997:.....	Not available
O/M costs per Service Connection:.....	Not available
Net Revenue 1997:.....	Not available
Total Water Produced 1997 (gallons):.....	Not available
Water Sold 1997 (gallons):.....	Not available
Unaccounted-for Water 1997 (%):.....	Not available

The City of Kuttawa serves 400 customers (369 households) within and around the fringe of the city limits. Their source of water is Lake Barkley with a treatment plant that has a total capacity of 750,000 gallons per day. Usage presently averages just over 300,000 gallons which is less than 50% of capacity. Storage consists of a clear well with 35,000 gallons of treated water and one standpipe with a capacity of 650,000 gallons. The city's distribution system is in good shape with a water loss or non-revenue usage of a little over 18% which is slightly above the 15% standard for water treatment facilities.

Kuttawa, like Eddyville, is expected to continue to grow through the year 2010. According to the Lyon County Water Supply Plan, water usage will increase approximately 20% through 2010. The City's source and treatment should be able to handle that volume as projected in the Plan.

OTHER SYSTEMS

KENTUCKY STATE PENITENTIARY

Kentucky State Penitentiary is located in Lyon County. The system serves a population of 1,000 and has 9 service connections. The state system water source is Barkley Lake

BAR X TRAILER PARK

Bar X Trailer Park is located in Lyon County. The system serves a population of 162 and has 49 service connections. The private, community system water source is wells.

IRON HILL CAMPGROUND

Iron Hill Campground is located in Lyon County. The system serves a population of 482 and has 146 service connections. The private, community system water source is wells.

BEND OF THE RIVERS

Bend Of The Rivers is located in Lyon County. The system serves a population of 295 and has 90 service connections. The private, community system purchases water from Lyon County Water District.

HOLIDAY HILLS CAMPING RESORT

Holiday Hills Camping Resort is located in Lyon County. The system serves a population of 446 and has 135 service connections. The private, transient non-community system water source is wells.

TARRYON CAMPING RESORT

Tarryon Camping Resort is located in Lyon County. The system serves a population of 150 and has 180 service connections. The private, transient non-community system water source is wells.

BUZZARD ROCK RESORT AND MARINA

Buzzard Rock Resort and Marina is located in Lyon County. The system serves a population of 150 and has 50 service connections. The private, transient non-community system water source is wells.

EDDY CREEK MARINA RESORT LLC

Eddy Creek Marina Resort LLC is located in Lyon County. The system serves a population of 330 and has 100 service connections. The private, transient non-community system water source is wells.

PRIVATE DOMESTIC SYSTEMS

About 1,000 people in Lyon County rely on private domestic water supplies: 850 on wells and 250 on other sources.

In the eastern and northern two-thirds of Lyon County more than three-quarters of the drilled wells in the uplands are adequate for a domestic supply. Yields as high as 50 gpm have been reported from wells penetrating large solution channels. In the low-lying areas of Eddy Creek most wells are inadequate for domestic use unless the well intercepts a major solution opening in the limestone in which the yield could be very large. Wells in the uplands of the

LBL in the southwestern quarter of the county generally do not yield enough water for domestic use. However in the lowlands adjacent to Kentucky and Barkley Lakes, three-fourths of the wells located within the bedrock yield enough for a domestic supply and can sometimes produce more than 5gpm.

Springs with flows ranging from a few gallons per minute to 1,280 gpm are found in the county. Minimum flow generally occurs in early fall, maximum flows in late winter.

MUHLENBERG COUNTY

(Muhlenberg County Water Service Area Map)

- Estimated 1999 population of 32,000--91% on public water
- Estimated 2020 population of 34,100--92% on public water
- 590 miles of water lines, with plans for 6 additional miles
- Estimated funding needs for public water 2000-2005--\$4,555,000
- Estimated funding needs for public water 2006-2020--\$0

Muhlenberg County had an estimated population of 32,037 (12,944 households) in 1999 with a projected population of 34,112 (14,566 households) in 2020. Public water is provided to 12,000 customers, or 92 percent of the county's residents. In areas of the county not served by public water, about 70 percent of the households rely on private domestic wells and 30 percent rely on other sources. An estimated 30 households will be added to public water service through new line extensions in 2000-2020.

Estimated Costs - Proposed Projects, 2000-2005

COUNTY/System		New Customers		Rehab	Source	Treatment	Tanks/ Pumps	Total
	Miles	Number	Cost in \$1000	in \$1000	in \$1000	in \$1000	in \$1000	in \$1000
MUHLENBERG								-
Muhlenberg Co. W/D				630			3,825	4,455
Muhlenberg Co. W/D #3	6	Est. 30	100					100
TOTAL	6	30	100	630			3,825	4,555

PUBLIC WATER SYSTEMS

The residents of Muhlenberg County are presently provided water by two water districts and three municipal systems. The Muhlenberg County Water District #1 has 5,484 customers in Muhlenberg County and 65 in Logan County, and the Muhlenberg County Water District #3 has 1,812 customers in Muhlenberg County and the City of Sacramento in McClean County. The municipal systems include the Cities of Greenville with 2,100 customers, Central City with 2,173 customers and Drakesboro with 366 customers.

MUHLENBERG COUNTY WATER DISTRICT

PWSID: 0890302
 System Type: COMMUNITY
 Owner Type: WATER DISTRICT
 Surface Source:
 Purchase Source:

WATER SERVICE AREAS MUHLENBERG COUNTY Kentucky



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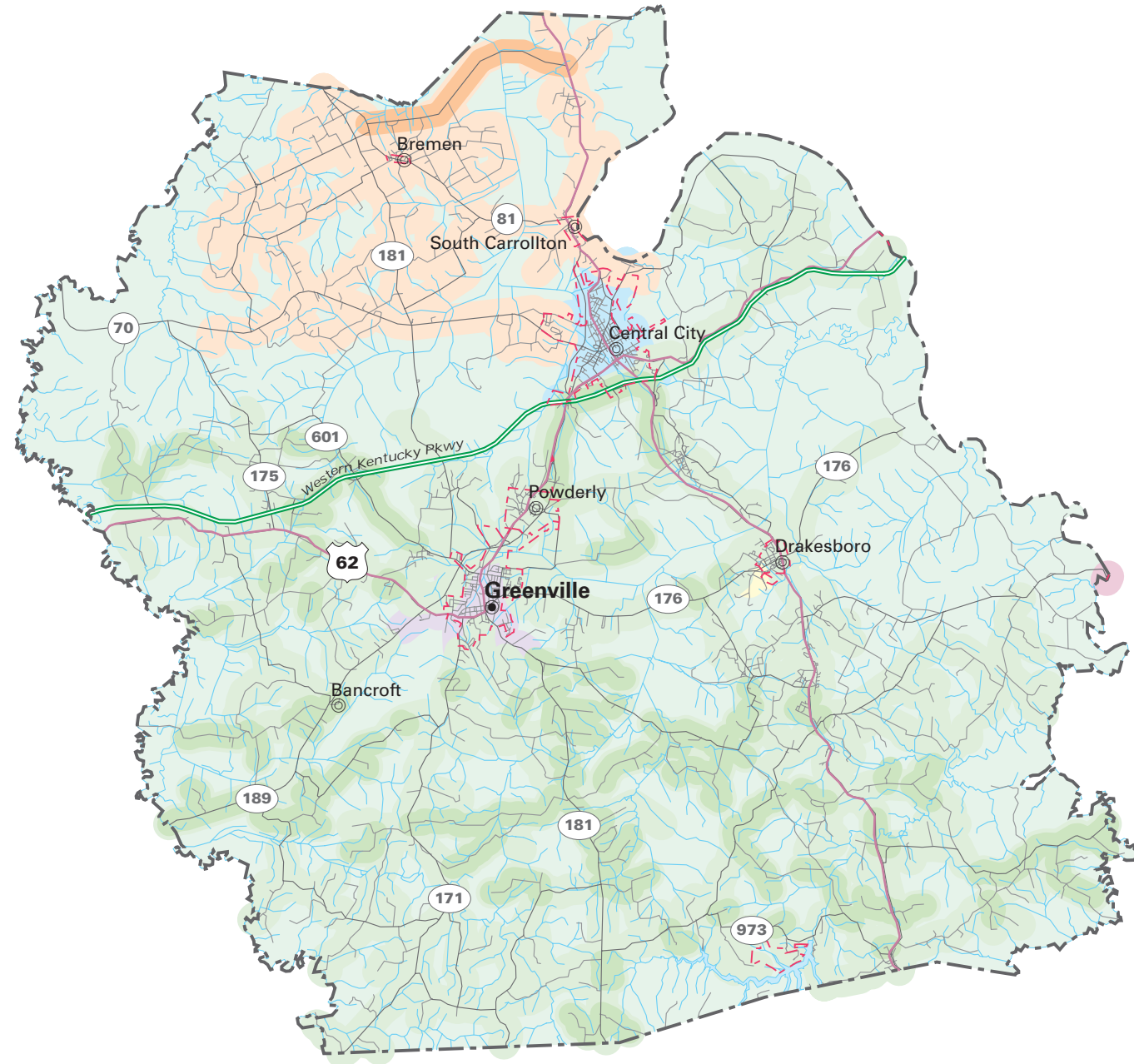
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Data Collection & GIS Input By:
Kentucky Area Development Districts



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WATER SERVICE STATUS BY OWNER

EXISTING SERVICE AREA	PROPOSED SERVICE AREA	OWNER
		MUHLENBERG COUNTY WATER DISTRICT #3
		MUHLENBERG COUNTY WATER DISTRICT
		GREENVILLE UTILITIES COMMISSION
		DRAKESBORO WATER DEPARTMENT
		CENTRAL CITY WATER AND SEWER SYSTEM
		BUTLER COUNTY WATER SYSTEM INCORPORATED

Well Source:
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 0.00
 Percent Daily Average Production: 0.00
 Total Tank Storage Capacity (gallons):..... 1,850,000.00
 Total Service Connections: 5,549.00
 Number of Employees:..... 19.00
 Treatment Operator Class:.....2D
 Distribution Operator Class:
 Customer Rate for 1,000 Gallons:..... 5.11
 O/M costs 1997:..... 1,446,553.00
 O/M costs per Service Connection: 262.10
 Net Revenue 1997: 76,091.00
 Total Water Produced 1997 (gallons):..... 0.00
 Water Sold 1997 (gallons):..... 402,266,400.00
 Unaccounted-for Water 1997 (%): 21.35

The Muhlenberg County Water District #1 purchases treated water from the Central City Municipal Water & Sewer Department. The total number of households served is 5,257 (65 in Logan County) which is the largest rural water district in the Pennyrile area. Storage consists of 11 tanks with a total storage capacity of 1,845,000. The District purchases all treated water from Central City and sells water to the City of Drakesboro.

According to the Muhlenberg County Water Supply Plan, the District (which uses approximately 1.3 million gallons of water per day) will experience a slight growth through the year 2010. Since their source of water is Central City and the Green River, there does not appear to be any problems with source and supply. The system does have some areas with problems of pressure and volume due to small line sizes and hilly terrain which affects pressure. To meet current as well as the future needs of the county, projects have been selected and ranked by Water District representatives, elected officials and the Pennyrile Area Development District's Board of Directors as being crucial to the future growth and development of the region.

MUHLENBERG COUNTY WATER DISTRICT #3

PWSID: 0890304
 System Type:..... COMMUNITY
 Owner Type: WATER DISTRICT
 Surface Source:
 Purchase Source:
 Well Source:
 Sells Water to: SACRAMENTO WATER WORKS
 Treatment Plant Capacity (MGD):..... 0.00
 Percent Daily Average Production: 0.00

Total Tank Storage Capacity (gallons):.....	500,000.00
Total Service Connections:	1,812.00
Number of Employees:.....	7.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	
Customer Rate for 1,000 Gallons:.....	4.64
O/M costs 1997:.....	489,947.00
O/M costs per Service Connection:	272.50
Net Revenue 1997:	87,332.00
Total Water Produced 1997 (gallons):.....	0.00
Water Sold 1997 (gallons):.....	181,265,700.00
Unaccounted-for Water 1997 (%):	14.66

Muhlenberg County Water District #3 also purchases water from the Central City water plant. Total households served by the District are 1,782 and the City of Sacramento in McClean County. Storage consists of two 250,000-gallon water tanks (500,000 gallons total). The distribution system is in good condition with adequate volume and pressure through the system. Water loss is generally held to a minimum and is maintained at less than 15% (including water used in line flushing.)

According to the Water Supply Plan, the District is expected to experience a moderate growth through the year 2010 and is not expected to experience any supply problems, as their source is Central City's water plant, which takes water from the Green River.

DRAKESBORO WATER DEPARTMENT

PWSID:.....	0890106
System Type:.....	COMMUNITY
Owner Type:.....	MUNICIPAL
Surface Source:	
Purchase Source:	
Well Source:	
Sells Water to:	
Treatment Plant Capacity (MGD):.....	0.00
Percent Daily Average Production:	0.00
Total Tank Storage Capacity (gallons):.....	100,000.00
Total Service Connections:	366.00
Number of Employees:.....	4.00
Treatment Operator Class:.....	1D
Distribution Operator Class:	
Customer Rate for 1,000 Gallons:.....	Not available
O/M costs 1997:.....	Not available
O/M costs per Service Connection:	Not available
Net Revenue 1997:	Not available
Total Water Produced 1997 (gallons):.....	Not available
Water Sold 1997 (gallons):.....	Not available
Unaccounted-for Water 1997 (%):	Not available

The City of Drakesboro purchases water from Muhlenberg Water District #1, which in turn purchases their water from the City of Central City. Drakesboro serves 366 households. The distribution system is in good condition, as the City has just completed a major renovation of the distribution system which repaired / replaced water lines damaged by underground coal mine subsidence. So, currently their distribution system has adequate pressure and volume. Storage capacity in the City consists of one 100,000-gallon storage tank. Part of the City's service area included approximately 61 households outside the City's corporate limits.

The Muhlenberg County Water Supply Plan indicates a small growth for the City; with their source being Central City, no future problems are anticipated

CENTRAL CITY WATER AND SEWER SYSTEM

PWSID: 0890071
System Type:..... COMMUNITY
Owner Type:..... MUNICIPAL
Surface Source:..... GREEN RIVER
Purchase Source:
Well Source:
Sells Water to:
Treatment Plant Capacity (MGD):..... 4.00
Percent Daily Average Production: 74.00
Total Tank Storage Capacity (gallons):..... 2,500,000.00
Total Service Connections: 2,173.00
Number of Employees:..... 17.00
Treatment Operator Class:.....2D
Distribution Operator Class:4A
Customer Rate for 1,000 Gallons:..... Not available
O/M costs 1997:..... Not available
O/M costs per Service Connection: Not available
Net Revenue 1997: Not available
Total Water Produced 1997 (gallons):..... Not available
Water Sold 1997 (gallons):..... Not available
Unaccounted-for Water 1997 (%): Not available

The Central City water plant draws its raw water from the Green River. The plant has a capacity of 4.0 million gallons a day and serves approximately 2,135 households in the City, the Muhlenberg County Water District #1, the Muhlenberg County Water District #3, the city of Sacramento in McClean County and the city of Drakesboro. In addition, the plant serves the Green River Correctional Facility. Currently, the plant is operating at 75% of its capacity. The City's distribution system has storage of 2.5 million gallons, which consists of

3 tanks and a clear well. The system does have a small problem with water loss and non-revenue usage (which is currently 17%, slightly higher than the acceptable norm of 15%). The City currently has a project funded through EDA to replace and enlarge the raw water line going to the treatment plant and construct a new 1.25 million-gallon ground water storage tank. The Green River, as its source, can handle future growth.

GREENVILLE UTILITIES COMMISSION

PWSID: 0890170
 System Type:..... COMMUNITY
 Owner Type:..... WATER DISTRICT
 Surface Source:..... LUZERNE LAKE
 Purchase Source:
 Well Source:
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 1.00
 Percent Daily Average Production: 58.00
 Total Tank Storage Capacity (gallons):..... 850,000.00
 Total Service Connections: 2,100.00
 Number of Employees:..... 11.00
 Treatment Operator Class:.....2D
 Distribution Operator Class:3A
 Customer Rate for 1,000 Gallons:.....Not available
 O/M costs 1997:.....Not available
 O/M costs per Service Connection:Not available
 Net Revenue 1997:Not available
 Total Water Produced 1997 (gallons):.....Not available
 Water Sold 1997 (gallons):.....Not available
 Unaccounted-for Water 1997 (%):Not available

The Greenville Utilities Commission operates a water treatment plant with a capacity of 1,000,000 gallons per day. Present utilization exceeds 60% of capacity. The sources of raw water for the plant are Luzerne Lake, City Lake and Greenville Country Club Lake. Currently, the Greenville Utilities Commission serves 2,121 households and 312 commercial and industrial customers. Storage of treated water is 850,000 gallons in two tanks and a clear well. The distribution system is in good condition with line sizes adequate for water volume and pressures are generally good throughout the system.

The Muhlenberg County Water Supply Plan indicates increased water usage of approximately 20% through the year 2010 due largely to industrial and commercial growth within the City's service area. At some point source may become a problem and additional

raw water may be required. Various options are now being studied to prepare for that circumstance.

PRIVATE DOMESTIC SYSTEMS

About 2,500 people in Muhlenberg County rely on private domestic water supplies: 1,800 on wells and 700 on other sources.

Throughout 90 percent of the county, most wells from depths of less than 300 feet are adequate for a domestic supply. Wells located in the Green River flood plain can produce as much as 100 gallons of hard water per minute. Most wells obtain their water from thick sandstone layers and will yield as much as 60 gpm. In the southwestern corner of the county only a few well yield enough water for a domestic supply. In a small localized area north of Earles, most wells produce less than 100 gallons per day which is far less than is needed for a domestic supply. In the northern and eastern part of the county moderately mineralized water may be obtained locally from deep sandstone formations at depths of 1200 feet.

Generally, ground water is hard to very hard and iron and salt may be present in objectionable amounts. Often ground water becomes saltier with depth.

TODD COUNTY

(Todd County Water Service Area Map)

- Estimated 1999 population of 11,200--95% on public water
- Estimated 2020 population of 11,100--100% on public water
- 270 miles of water lines, with plans for 190 additional miles of lines
- Estimated funding needs for public water 2000-2005--\$3,351,000
- Estimated funding needs for public water 2006-2020--\$1,904,000

Todd County had an estimated population of 11,165 (4,577 households) in 1999 with a projected population of 11,150 (4,855 households) in 2020. Public water is provided to 4,600 customers, or over 95 percent of the county's residents. In areas of the county not served by public water, about 5 of 6 percent of the households rely on private domestic wells and 1 of 6 percent rely on other sources. An additional 250 households are expected to be served by new line extensions by 2020.

Estimated Costs - Proposed Projects, 2000-2005

COUNTY/System		New Customers		Rehab	Source	Treatment	Tanks/ Pumps	Total
	Miles	Number	Cost in \$1000	in \$1000	in \$1000	in \$1000	in \$1000	in \$1000
TODD								-
Todd Co. W/D	121	44	678			252	1,200	2,130
Elkton			295					295
Trenton	23	50	379	247			300	926
TOTAL	144	94	1,352	247		252	1,500	3,351

Estimated Costs - Proposed Projects, 2006-2020

COUNTY/System		New Customers		Rehab	Source	Treatment	Tanks/ Pumps	Total
	Miles	Number	Cost in \$1000	in \$1000	in \$1000	in \$1000	in \$1000	in \$1000
TODD								-
Todd County W/D	47	Est. 155	1,404				500	1,904
Total	47	155	1,404				500	1,904

PUBLIC WATER SYSTEMS

The residents of Todd County are currently served by four water systems: the Todd County Water District, the City of Elkton, City of Guthrie, and the City of Trenton. In addition, the South Logan County Water District serves approximately 75 households in Todd County, while the Todd County Water District serves 350 households in Logan County. Also, of particular significance, it should be noted that Todd and Logan Counties have

WATER SERVICE AREAS TODD COUNTY Kentucky

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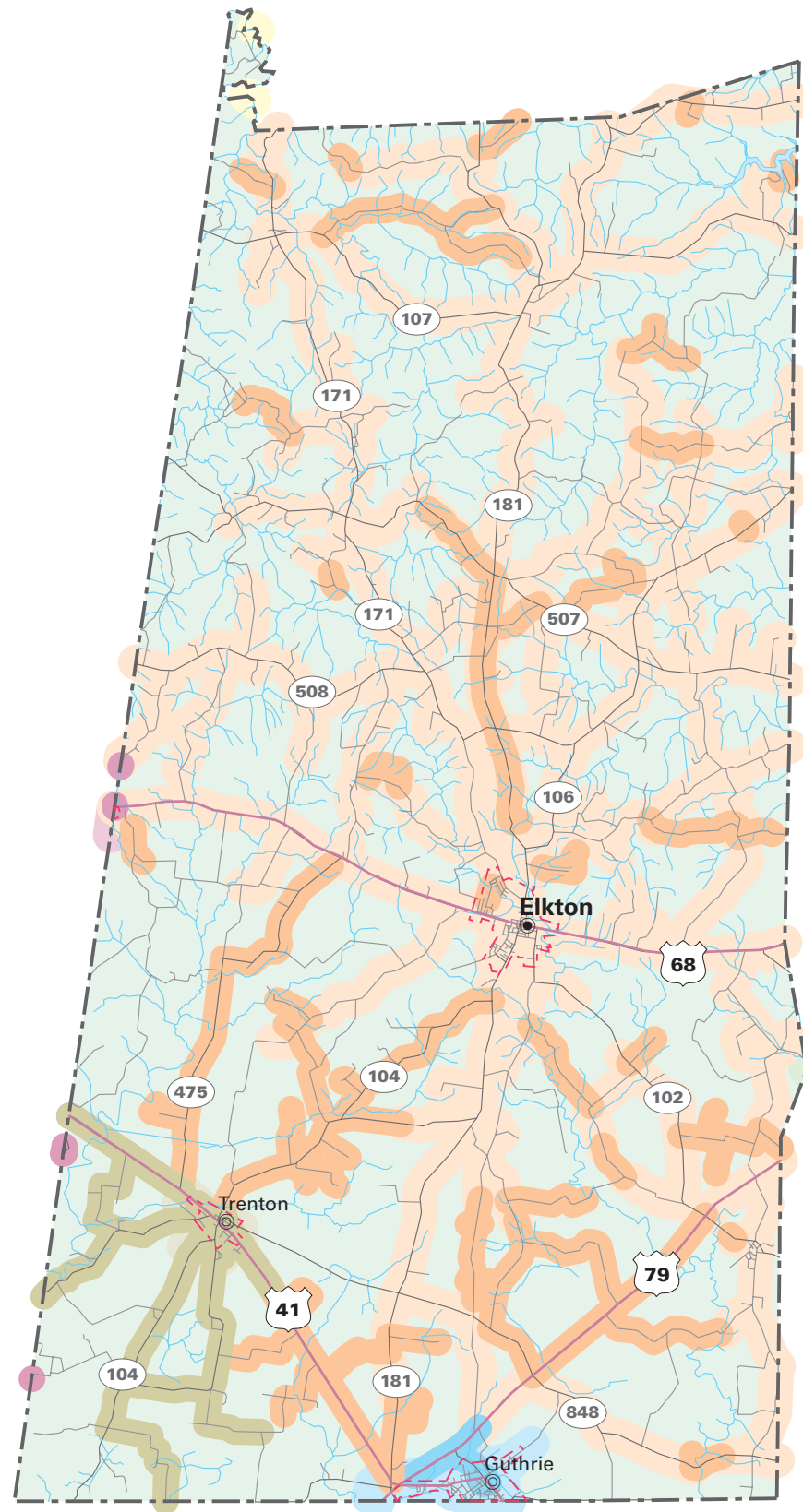
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Kentucky Area Development Districts



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WATER SERVICE STATUS BY OWNER

EXISTING SERVICE AREA	PROPOSED SERVICE AREA	OWNER
		TRENTON WATER WORKS
		TODD COUNTY WATER DISTRICT
		SOUTH LOGAN WATER ASSOCIATION
		PEMBROKE WATER WORKS
		MUHLENBERG COUNTY WATER DISTRICT
		GUTHRIE WATER WORKS
		CHRISTIAN COUNTY WATER DISTRICT

developed a Water Commission that will provide all potable water to every water system in both counties and will take four treatment plants in Todd County out of service. This important project consists of constructing a 10.0 MG/D treatment plant near Guthrie with a raw water line extending into the Cumberland River in Tennessee. This will serve as the sole source of water for both counties.

TODD COUNTY WATER DISTRICT

PWSID: 1100944
 System Type:..... COMMUNITY
 Owner Type:..... WATER DISTRICT
 Surface Source:..... SETTLES LAKE
 Purchase Source:
 Well Source:
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 1.30
 Percent Daily Average Production: 49.00
 Total Tank Storage Capacity (gallons):..... 520,000.00
 Total Service Connections: 2,485.00
 Number of Employees:..... 0.00
 Treatment Operator Class:
 Distribution Operator Class:3A
 Customer Rate for 1,000 Gallons:..... 6.77
 O/M costs 1997:..... 602,601.00
 O/M costs per Service Connection: 248.91
 Net Revenue 1997: 28,882.00
 Total Water Produced 1997 (gallons):..... 239,259,150.00
 Water Sold 1997 (gallons):..... 224,506,036.00
 Unaccounted-for Water 1997 (%): 9.53

The Todd County Water District currently operates two water treatment plants. The source of one plant is Lake Settle located in the northern part of the County; the source for the other is a well located in Elkton. The total capacity of both plants is 1,300,000 gallons per day. Neither source of water is adequate to meet local needs, which is why Todd County and Logan County (which also has a supply problem) formed the Logan-Todd Water Commission. The District's plant on Lake Settle serves all of northern Todd and the customers located in south Todd. The source in Elkton, while operated by the District, serves customers in the City of Elkton, but has to be supplemented by water from Lake Settle. Also, due to location and convenience to the Allensville area in southeast Todd County, the District purchases water from the South Logan Water District. Total customers served by the Todd County Water District is 2,485, with 350 located in Logan County.

The District's distribution system is in good condition, with adequate pressures and flows to meet residential needs. Water loss and non-revenue production is just above the 15% mark. Storage consists of four tanks and two clear wells for a total storage capacity of 520,800 gallons.

The Todd County Water Supply Plan indicates slow growth for Todd County through the year 2010. However, there are developments that may create additional growth, i.e., industrial growth in Hopkinsville, Clarksville, Elkton and Guthrie, which will change those forecasts from less than 10% to approximately 20%. Also, because Todd County has a recognized water shortage, the development of the Logan-Todd Water Treatment facility will provide new opportunities for Todd County to attract business and industry

CITY OF ELKTON WATER DEPARTMENT

The City of Elkton's source of water is a well located in the City. The treatment process is composed of pressure sand filters and chlorinators, and is managed by the Todd County Water District. The cost to the City is a very nominal 37 cents per 1,000 gallons. A unique arrangement exists between the City and District, with the District also providing service to the City's distribution system and billing and financial services provided by the City for their customers. The cost for providing maintenance services to the Elkton distribution system is not included in the cost for water, but billed separately for services rendered. The City has 967 customers, with 860 residential households. The distribution system generally is adequate in regard to pressure and volume and, with storage, will improve volume to existing industry located on the west side of the City. Funds for the storage tanks have been approved, and construction is nearing completion. The City's growth is expected to increase due to some success by the City in attracting industry and the completion of the US 68-80 Bypass. The upgrading of this important highway to four lanes will allow workers to live in Elkton and commute to Hopkinsville, Russellville or other industrial centers. This will make the city of Elkton more attractive to those residents looking for the security of a smaller city.

GUTHRIE WATER WORKS

PWSID:.....	1100171
System Type:.....	COMMUNITY
Owner Type:.....	MUNICIPAL
Surface Source:.....	MERIWETHER SPRING
Purchase Source:	
Well Source:	
Sells Water to:	
Treatment Plant Capacity (MGD):.....	0.53
Percent Daily Average Production:	42.00
Total Tank Storage Capacity (gallons):.....	150,000.00
Total Service Connections:	815.00
Number of Employees:.....	1.00
Treatment Operator Class:.....	2D
Distribution Operator Class:	2A
Customer Rate for 1,000 Gallons:.....	Not available
O/M costs 1997:.....	Not available
O/M costs per Service Connection:	Not available
Net Revenue 1997:	Not available
Total Water Produced 1997 (gallons):.....	Not available
Water Sold 1997 (gallons):.....	Not available
Unaccounted-for Water 1997 (%):	Not available

The City of Guthrie’s source of water currently is Merriweather Springs located several miles west of the City. Raw water is pumped from the spring into a water treatment plant located in the City of Guthrie. As a city developed around the railroad, many of the lines were installed to accommodate the railroad in the 1920’s and then converted for use by the City. The treatment plant has a capacity of 432,000 gallons per day and has some excess capacity. However, the spring during dry spells has been dangerously low; for that reason, Guthrie will do away with treatment and purchase all their water from the Logan-Todd Regional Water Commission. The City’s distribution system has many problems with volume and pressure. Many of the distribution lines are too small, leak or break, and cannot be located due to a system never accurately mapped. Water loss and non-revenue production exceeds 40% due to the problems that are associated with old cast iron and steel water lines. The City is continuously repairing and replacing lines but, as in most areas, funds are limited to make the necessary renovations to the distribution system. Guthrie, with its location near Clarksville and I-24 will experience more growth than what is projected by the Water Supply Plan. With the installation of a natural gas system and the work to eliminate the flooding of some areas of the City, Guthrie will be attractive for more residential growth. Currently, the City has 828 customers with 778 residential households.

TRENTON WATER WORKS

PWSID:.....	1100428
System Type:.....	COMMUNITY
Owner Type:.....	MUNICIPAL
Surface Source:	
Purchase Source:	
Well Source:	
Sells Water to:	
Treatment Plant Capacity (MGD):.....	0.20
Percent Daily Average Production:	41.00
Total Tank Storage Capacity (gallons):.....	150,000.00
Total Service Connections:	300.00
Number of Employees:.....	1.00
Treatment Operator Class:.....	1D
Distribution Operator Class:	2A
Customer Rate for 1,000 Gallons:.....	Not available
O/M costs 1997:.....	Not available
O/M costs per Service Connection:	Not available
Net Revenue 1997:	Not available
Total Water Produced 1997 (gallons):.....	Not available
Water Sold 1997 (gallons):.....	Not available
Unaccounted-for Water 1997 (%):	Not available

The residents of Trenton receive their water from 3 wells located within the corporate limits of the City. During heavy rains when the wells receive an influx of silt, which is discharged in the many sinkholes in the area, the plant has difficulty handling it. It contaminated the treated water, requiring boil water warnings. The treatment plant has a capacity of 200,000 gallons per day. Trenton serves 309 customers with 297 residential households.

The distribution system has similar problem as Guthrie, only more so. Water loss at times exceeds 50%; both water storage tanks require repairs and repainting; and many of the water meters are inoperable. Funds to make the necessary repairs are not available by the City, and the system must be upgraded before the Logan-Todd Water Plant come on line.

The City has had residential growth due to their location and proximity to I-24, Clarksville, Tennessee, and Hopkinsville.

OTHER SYSTEMS

SHADY SPRINGS GOLF COURSE

Shady Springs Golf Course is located in Todd County. The system serves a population of 30 and has 1 service connection. The private, transient non-community system has treatment capacity of 12,000 gallons per day. The water source is wells.

PRIVATE DOMESTIC SYSTEMS

About 550 people in Todd County rely on private domestic water supplies: 450 on wells and 100 on other sources.

In the southern half of Todd County more than three-quarters of the drilled wells in the uplands are adequate for a domestic supply. Yields as high as 50 gpm have been reported from wells penetrating large solution channels. In the low-lying areas of the Elk and West Forks of the Red River and along Spring Creek, most wells are inadequate for domestic use unless the well intercepts a major solution opening in the limestone in which the yield could be very large. Ground water in the northern half of the county is not as prevalent as in the southern half of the county. Most wells in the northern half of the county are inadequate for a domestic supply. Some wells in sandstone formations yield enough water for a domestic supply.

Springs with flows ranging from a few gallons per minute to 3,000 gpm are found in the county. Minimum flow generally occurs in early fall, maximum flows in late winter.

TRIGG COUNTY

(Trigg County Water Service Area Map)

- Estimated 1999 population of 12,600--95% on public water
- Estimated 2020 population of 16,000--96% on public water
- 460 miles of water lines, with plans for 50 additional miles of lines
- Estimated funding needs for public water 2000-2005--\$4,001,000
- Estimated funding needs for public water 2006-2020--\$0

Trigg County had an estimated population of 12,552 (5,549 households) in 1997 with a projected population of 15,985 (7,518 households) in 2020. Public water is provided to 5,700 households, or over 95 percent of the county's residents. In areas of the county not served by public water, about 80 percent of the households rely on private domestic wells and 20 percent rely on other sources. An additional 90 households are expected to be served by new line extensions by 2020.

Estimated Costs - Proposed Projects, 2000-2005

COUNTY/System		New Customers		Rehab	Source	Treatment	Tanks/ Pumps	Total
	Miles	Number	Cost in \$1000	in \$1000	in \$1000	in \$1000	in \$1000	in \$1000
TRIGG								-
Barkley Lake W/D	48	45	1,546	105		1,200	800	3,651
Cadiz	2	41	350					350
TOTAL	50	86	1,896	105		1,200	800	4,001

PUBLIC WATER SYSTEMS

The residents of Trigg County are presently provided water by two community water systems; the Barkley Lake Water District and the City of Cadiz Waterworks, and 12 non-community systems.

BARKLEY LAKE WATER DISTRICT

PWSID: 1110019
 System Type:..... COMMUNITY
 Owner Type:..... WATER DISTRICT
 Surface Source:..... LAKE BARKLEY
 Purchase Source:
 Well Source:
 Sells Water to:
 Treatment Plant Capacity (MGD):..... 2.00
 Percent Daily Average Production: 58.00

WATER SERVICE AREAS

TRIGG COUNTY

Kentucky

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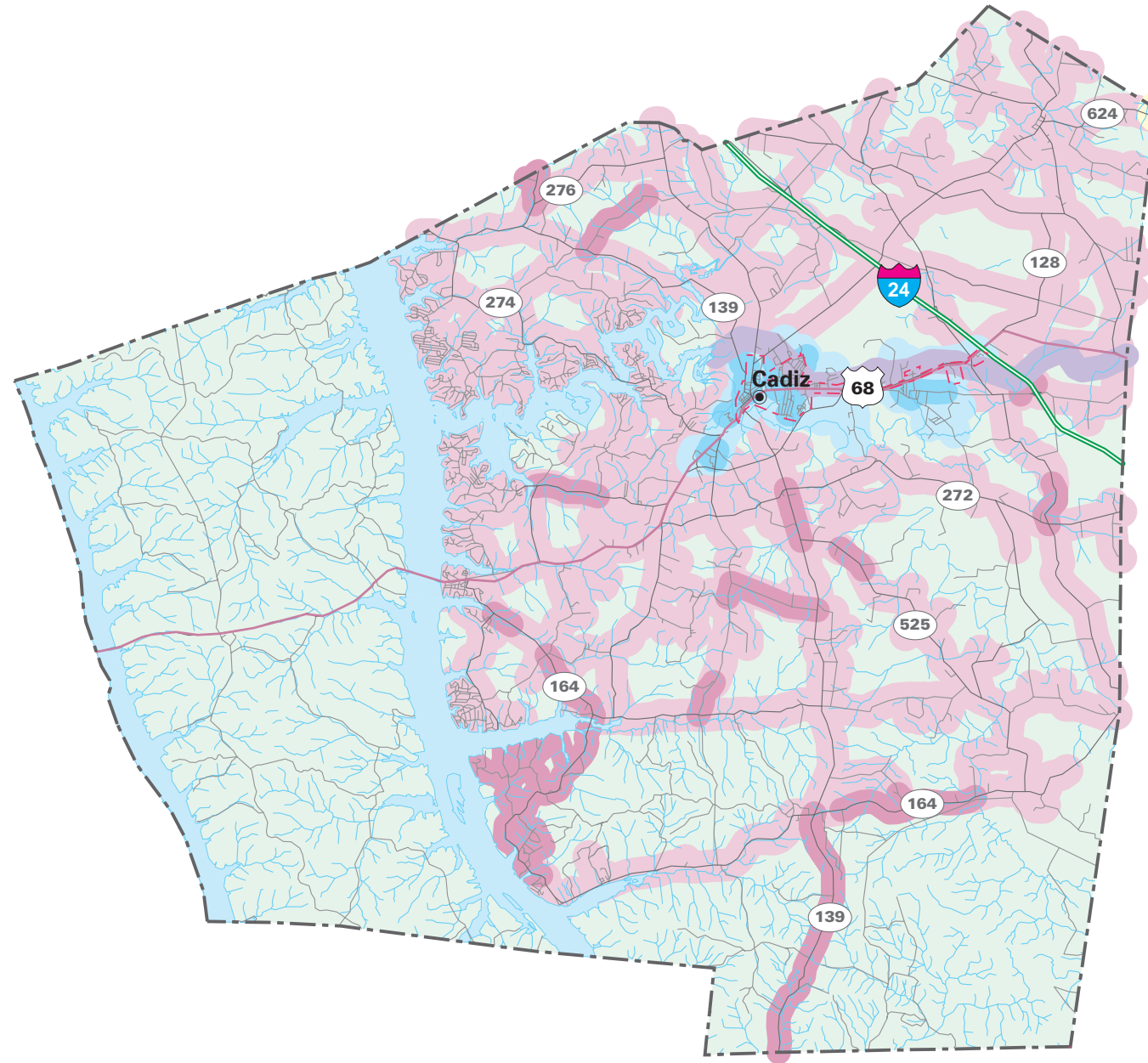
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 Kentucky Area Development Districts



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WATER SERVICE STATUS BY OWNER

EXISTING SERVICE AREA	PROPOSED SERVICE AREA	OWNER
		HOPKINSVILLE WATER ENVIRONMENTAL AUTHORITY
		CHRISTIAN COUNTY WATER DISTRICT
		CADIZ MUNICIPAL WATER COMPANY
		BARKLEY LAKE WATER DISTRICT

Total Tank Storage Capacity (gallons):.....	1,950,000.00
Total Service Connections:	4,436.00
Number of Employees:.....	13.00
Treatment Operator Class:.....	3D
Distribution Operator Class:	3A
Customer Rate for 1,000 Gallons:.....	5.57
O/M costs 1997:.....	695,524.00
O/M costs per Service Connection:	156.72
Net Revenue 1997:	206,820.00
Total Water Produced 1997 (gallons):.....	355,588,000.00
Water Sold 1997 (gallons):.....	248,288,000.00
Unaccounted-for Water 1997 (%):	19.38

Barkley Lake Water District gets its water from the nearby Barkley Lake and according to the Trigg County Water Supply Plan has an adequate supply of raw water to support any future needs. The District currently services 4,248 households in Trigg County, 75 in Lyon County and 43 in Caldwell County. Additionally, the District sells treated water to the Christian County Water District. The Districts operates a Water Treatment Plant that has a production capacity of 2.0 million gallons per day. On an average day the plant produces approximately 1,175,000 gallons of potable water or less than 60% of its designed capacity. The district's storage system consists of six tanks located at various points within its territory and a clear well located at its treatment facility. The total storage capacity of the district is 1,950,000 gallons. The calculated charge for 5,000 gallons of treated water (residential usage) is \$27.83 which when compared to other districts within the Pennyriple is considered quite reasonable. Lake Barkley Water District has a total of 13 employees with 6 certified water treatment plant operators and 5 certified to operate the distribution system. The other employees provide billing and financial oversight.

The need for water service expansion in the Barkley Lake territory results primarily from the rapid subdivision development in many of its' rural lakefront areas as well as other areas. According to a study conducted by the Kentucky State Data Center in Louisville, Trigg County has experienced growth in excess of 19.5% from the year 1990 through July 1998. That same study also touts Trigg County as one of only two Western Kentucky Counties that is projected to experience growth of 50% or more by the Year 2020. At present, within the territory of the Barkley Lake Water District there are approximately 275 households that aren't currently being served. In order to serve these households, the Districts' distribution system will require many upgrades to increase and maintain an adequate flow and pressure.

To meet current as well as the future needs of the county, projects have been selected and ranked by Trigg County system representatives, elected officials and the Pennyriple Area Development District's Board of Directors as being crucial to the future growth and development of the region.

CADIZ MUNICIPAL WATER COMPANY

PWSID:..... 1110054
System Type:..... COMMUNITY
Owner Type:..... MUNICIPAL
Surface Source:..... CADIZ SPRING
Purchase Source:
Well Source:
Sells Water to:
Treatment Plant Capacity (MGD):..... 0.72
Percent Daily Average Production: 50.00
Total Tank Storage Capacity (gallons):..... 980,000.00
Total Service Connections: 1,632.00
Number of Employees:..... 9.00
Treatment Operator Class:.....2D
Distribution Operator Class:3A
Customer Rate for 1,000 Gallons:..... 3.83
O/M costs 1997:..... Not available
O/M costs per Service Connection: Not available
Net Revenue 1997: Not available
Total Water Produced 1997 (gallons):..... Not available
Water Sold 1997 (gallons): Not available
Unaccounted-for Water 1997 (%): Not available

The City of Cadiz Waterworks receives its water from a spring located within its territory. According to the Trigg County Water Supply Plan Study (Phase 1) that was conducted in 1995 it was found not to be an adequate supply to meet future needs in terms of both quantity and quality. In addition to the spring the city also has entered into a trade agreement with the Barkley Lake Water District. By way of this agreement, Cadiz Water System customers located just west of the city are served through a master meter owned by Lake Barkley and in turn customers of Lake Barkley located on Rocky Ridge Road are served through a mater meter owned by the City of Cadiz. The system currently serves 1,491 total households, with 510 of those located outside of the city's corporate limits, as well as 218 commercial and 18 industrial customers. The system operates a water treatment plant that has a production capacity of 720,000 gallons per day. On an average day the plant produces approximately 443,000 gallons of potable water or about 62% of its designed capacity. The system has a total storage capacity of 978,000 gallons in four tanks. The calculated cost for

5,000 gallons of treated water (residential usage) is currently \$19.14 which, when compared to other systems within the Pennyriple, is considered quite reasonable. The Cadiz Water System employs 3 certified water treatment plant operators. Additionally, there are other operators that are located at its Sewer treatment facility and 3 employees that handle the billing and financial concerns of the system.

The City water distribution system currently has many problem areas, especially within its original downtown area, which was constructed in the early 1920's. Old steel and cast iron water lines have rusted and deteriorated to the point that there are numerous leaks. Also in the same areas small water lines create problems with volume and pressure. The city from time to time has made some improvements to these problem areas but much remains to be done. Many of the lines are located under paved and concrete streets, which make the replacement a difficult, an expensive undertaking. To meet current as well as the future needs of the county, projects have been selected and ranked by Trigg County system representatives, elected officials and the Pennyriple Area Development District's Board of Directors as being crucial to the future growth and development of the region.

OTHER SYSTEMS

LBL EEC EMPIRE FARM

LBL EEC Empire Farm is located in Trigg County. The system serves a population of 25 and has 1 service connection. The federal, transient non-community system has treatment capacity of 24,000 gallons per day. The water source is wells.

LBL NORTH ENTRANCE STATION

LBL North Entrance Station is located in Trigg County. The system serves a population of 25 and has 1 service connection. The federal, transient non-community system has treatment capacity of 4,800 gallons per day. The water source is wells.

LBL HILLMAN FERRY B

LBL Hillman Ferry B is located in Trigg County. The system serves a population of 42 and has 400 service connections. The federal, non-transient, non-community system has treatment capacity of 73,000 gallons per day. The water source is wells.

LBL CRAVENS CREEK

LBL Cravens Creek is located in Trigg County. The system serves a population of 25 and has 1 service connection. The federal, transient non-community system has treatment capacity of 14,400 gallons per day.

TVA-LBL WOODLAND NATURE CENTER

TVA-LBL Woodland Nature Center is located in Trigg County. The system serves a population of 25 and has 1 service connection. The federal, transient non-community system has treatment capacity of 4,800 gallons per day. The water source is groundwater from wells.

LBL BIRMINGHAM FERRY/YALE

LBL Birmingham Ferry/Yale is located in Trigg County. The system serves a population of 25 and has 1 service connection. The federal, transient non-community system has treatment capacity of 14,400 gallons per day. The water source is wells.

LBL ADMINISTRATION BUILDING

LBL Administration Bldg is located in Trigg County. The system serves a population of 25 and has 1 service connection. The federal, non-transient non-community system has treatment capacity of 31,200 gallons per day. The water source is wells.

LBL MAINTENANCE CENTER

LBL Maintenance Center is located in Trigg County. The system serves a population of 25 and has 1 service connection. The federal, non-transient non-community system has treatment capacity of 24,000 gallons per day. The water source is wells.

LBL CAMP ENERGY

LBL Camp Energy is located in Trigg County. The system serves a population of 25 and has 1 service connection. The federal, transient non-community system has treatment capacity of 14,400 gallons per day. The water source is wells.

TVA-LBL FENTON LAKE ACCESS C/O

TVA-LBL Fenton Lake Access C/O is located in Trigg County. The system serves a population of 25 and has 2 service connections. The federal, transient non-community system has treatment capacity of 15,120 gallons per day. The water source is wells.

LBL WRANGLERS CAMP

LBL Wranglers Camp is located in Trigg County. The system serves a population of 25 and has 1 service connection. The federal, transient non-community system has treatment capacity of 24,000 gallons per day. The water source is wells.

LBL VISITORS CENTER

LBL Visitors Center is located in Trigg County. The system serves a population of 25 and has 1 service connection. The federal, transient non-community system has treatment capacity of 43,200 gallons per day. The water source is wells.

PRIVATE DOMESTIC SYSTEMS

About 600 people in Trigg County rely on private domestic water supplies: 480 on wells and 120 on other sources.

In the eastern two-thirds of Trigg County more than three-quarters of the drilled wells in the uplands are adequate for a domestic supply. Yields as high as 50 gpm have been reported from wells penetrating large solution channels. In the low-lying areas of the Little River and its major tributaries, most wells are inadequate for domestic use unless the well intercepts a major solution opening in the limestone in which the yield could be very large. Wells in the uplands of the LBL in the western third of the county generally do not yield enough water for domestic use. However in the lowlands adjacent to Kentucky and Barkley Lakes three-fourths of the wells yield enough for a domestic supply and can sometimes produce more than 5gpm.

Springs with flows ranging from a few gallons per minute to 3,000 gpm are found in the county. Minimum flow generally occurs in early fall, maximum flows in late winter.