1.0 INTRODUCTION

1.1 THE ENVIRONMENTAL IMPACT STATEMENT

This Environmental Impact Statement (EIS) analyzes the potential environmental effects of a proposed dam and reservoir project in Jackson County, Kentucky (**Figure 1.2-1**). This report discusses the potential impacts of the site preparation, construction, operation, and connected actions associated with a dam, reservoir, and raw water transmission main leading from the reservoir to the Jackson County Water Association (JCWA) Treatment Plant at Tyner Lake.

Jackson County is part of the Kentucky Highlands Empowerment Zone, launched under Title XIII of the Omnibus Budget Reconciliation Act of 1993. Jackson County has been designated as a Rural Empowerment Community within the Kentucky Highlands Empowerment Zone. Incorporated under the name Jackson County Empowerment Zone Community (EZ), it helps to manage project proposals for the Kentucky Highlands Empowerment Zone. The EZ is a Federally-sponsored initiative to empower rural communities to create jobs and opportunities for economic development through Federal, State, and local government and private-sector partnerships.

The EZ has applied for Federal funds from the U.S. Department of Agriculture's (USDA) Rural Utilities Service (RUS) and from the Department of Housing and Urban Development (HUD) to help fund the Jackson County Lake Project. **Table 1.1-1** lists potential sources of funding for this project, along with the application/submission date and amount of funding obtained or requested.

Table 1.1-1. Proposed Funding for the Jackson County Lake Project

	Funding Source	Date of Submittal or Obtainment	Amount Requested or Obtained
Federal	Appalachian Regional Commission	To be submitted August/ September 2000	$500,000
	USDA, Rural Utilities Service	Preapplication submitted July 10, 1997	$3,500,000
	U.S. Department of Commerce, Economic Development Administration	N/A	$1,500,000
	HUD, Community Development Block Grant	To be submitted April 2000	$1,000,000
State	Tobacco Settlement Money	N/A	$1,000,000
Local	Empowerment Zone Funding	Obtained December 23, 1994	$5,000,000
		Total:	$12,500,000

As the Lead Agency, RUS has initiated an EIS on this project proposal, in accordance with the provisions of the National Environmental Policy Act (NEPA) of 1969 (42 United States Code (USC) 4321-4346), the Council on Environmental Quality (CEQ) regulations (40 Code of Federal Regulations (CFR) 1500-1508), and RUS NEPA policies and procedures (7 CFR part 1794).

One major purpose of this EIS is to help Federal agency officials make their decisions. RUS and HUD will decide, partly on the basis of this EIS, whether or not to provide the funding requested by the Jackson County EZ. Because United States Forest Service (USFS) land may be involved, as will be discussed in Sections 2.4 and 3.2.8 of this EIS, the USFS will decide whether they will make the required land available.

In addition to the information presented in this EIS, the decision-makers will also consider the comments that citizens, organizations, and other agencies have on this EIS. For this reason, the Draft EIS will be made widely-available for public review and comment (see text box on the right). All public comments received, along with agency responses, will be included in the Final EIS. The Final EIS will also be made available to the public, and will serve as input to the agencies' decision-makers.

How to Provide Comments on this Draft EIS

This Draft EIS will be made available for review at public libraries within Jackson County. Written comments may be submitted in the following ways:

- In person, at a **public meeting** to be held on Tuesday, June 27, 2000, in two sessions, 10 a.m. and 7 p.m., in the gymnasium of Jackson County High School, located on US 421. For more information, contact the Jackson County EZ Community, Inc. at (606) 287-8395.
- By **regular mail** to the following:

  Mr. Mark Plank, Senior Environmental Scientist
  UDSA Rural Utilities Service
  Engineering and Environmental Staff
  Mail Code 1571
  1400 Independence Ave., SW
  Washington, DC 20250
- By **email** at the following address: mplank@rus.usda.gov
- By filling out the **comment form** provided on Page 1-3 of this Draft EIS.
- **Online**, by viewing this DEIS electronically and providing comments at the following website:

  http://www.usda.gov/rus/water/ees/deis-jc.htm

1.2 PURPOSE AND NEED FOR ACTION

The purpose of the Jackson County Lake Project is two-fold:

- Provide adequate water supplies for the projected residential, commercial, and industrial needs of Jackson County, and part of one or more neighboring counties over the next 50 years; and
- Provide lake-based recreational opportunities to meet the present and future needs of the residents of Jackson County and surrounding areas.

COMMENT FORM

PROPOSED JACKSON COUNTY LAKE PROJECT DRAFT ENVIRONMENTAL IMPACT STATEMENT

Please write your comments below, mail them to the address shown or submit via email.

Note: Section 1503.3 of the Council on Environmental Quality's NEPA Regulations states that: "Comments on an environmental impact statement or on a proposed action shall be as specific as possible and may address either the adequacy of the statement or the merits of the alternatives discussed or both." Your comments will be most useful if you identify specific issues, information, or conclusions, and refer to particular sections or page numbers. Please use the following format and use as many sheets as necessary.

Comments:

Page Number	Section Number	Comment

Mail to: Mr. Mark Plank, Senior Environmental Scientist, USDA Rural Utilities Service, Engineering and Environmental Staff, Mail Stop 1571, 1400 Independence Avenue, SW, Washington, DC 20250

E-mail: mplank@rus.usda.gov

As discussed in more detail in the following sections, Jackson County has a documented need to obtain additional water supplies for its continued population growth, as well as for its commercial and industrial development. **Figure 1.2-1** shows Jackson County and its existing water supply reservoirs. The action proposed by the Jackson County EZ is to obtain additional

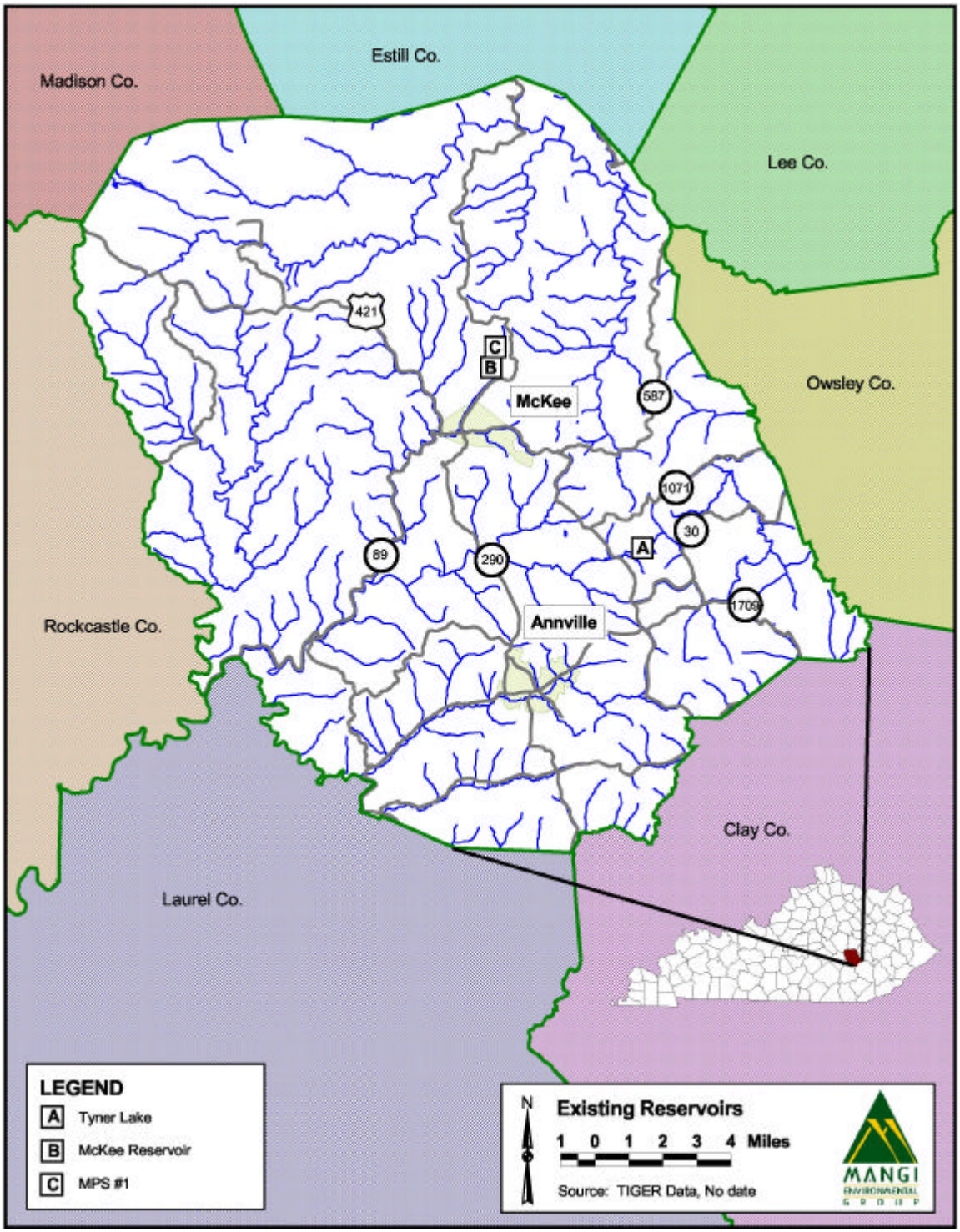


Figure 1.2-1. Jackson County, Kentucky and Its Existing Water Supply Reservoirs

water and recreational opportunities by constructing a dam to create a reservoir. Recreational uses of the reservoir and adjacent land areas would be managed to ensure the usability of the reservoir water for domestic purposes. The proposed action is described in more detail in later sections, along with other courses of action that have been considered to meet the needs of Jackson County.

1.2.1 WATER SUPPLY

Section 1.2.1 summarizes information and data presented in the *Water Needs Analysis* prepared for Jackson County by Commonwealth Technologies, Incorporated (MEG, 1999c). This analysis is provided as Appendix E of this EIS. As documented in this analysis, Jackson County has two primary public drinking water suppliers and two (soon to be three) surface water sources of public drinking water, which are shown in **Figure 1.2-1**. These are the Jackson County Water Association (JCWA), which uses Tyner Lake, also known as Beulah Lake, and the City of McKee, which uses McKee Reservoir. A third water supplier in the County is the Wood Creek Water District, which supplies water along KY 30 near the Laurel County and Jackson County border.

JCWA and the City of McKee reportedly provide water to approximately 70 percent of the County's population. The remaining residents rely on groundwater or cisterns for potable water. **Figure 1.2-2** shows the service areas of the City of McKee, JCWA, and water suppliers in adjoining counties. Seven counties border Jackson County. They are Clay, Estill, Laurel, Lee, Madison, Owsley, and Rockcastle Counties. Jackson, Clay, Laurel, and Rockcastle Counties form the Cumberland Valley (CV) Area Development District (ADD). Estill and Madison Counties are in the Bluegrass ADD, and Lee and Owsley Counties are in the Kentucky River ADD. There are 24 water utilities located within the 7 counties surrounding Jackson County. The jurisdictional boundaries of these water utilities are shown in **Figure 1.2-2**. Any areas not served within these counties are being addressed in the Long Range Water Supply Plans (LRWSP) for those counties and by the water utilities associated with those counties.

JCWA and Tyner/Beulah Lake

Tyner Lake and its dam were built in 1969. The dam impounds Flat Lick Creek, a tributary of Laurel Fork. It has a drainage area of 670 acres and a total volume of 792 million gallons at the normal pool elevation of 1,250 feet above mean sea level (MSL).

The JCWA service area encompasses most of Jackson County, with the exceptions of McKee's incorporated limits and those areas served by the Wood Creek Water District. JCWA also sells water to portions of Rockcastle County Water District and Beattyville Water Works.

As of October 1998, JCWA served 3,466 residential customers. This number has increased by about 200 customers per year over the past five years without any new waterline construction projects being undertaken. JCWA also serves approximately 200 commercial and public customers and provides service to 76 acres of developed industrial land contained within two industrial parks, Northern Jackson County Industrial Park and Jackson County Regional Industrial Park. Kenvirons, Incorporated and JCWA are working on a project to add 40 miles of

waterline in Jackson County, which still would not have all residents connected to public water supply. This new line would add approximately 200 new customers, but is contingent on expanded treatment capacity at the JCWA Treatment Plant and additional water supply.

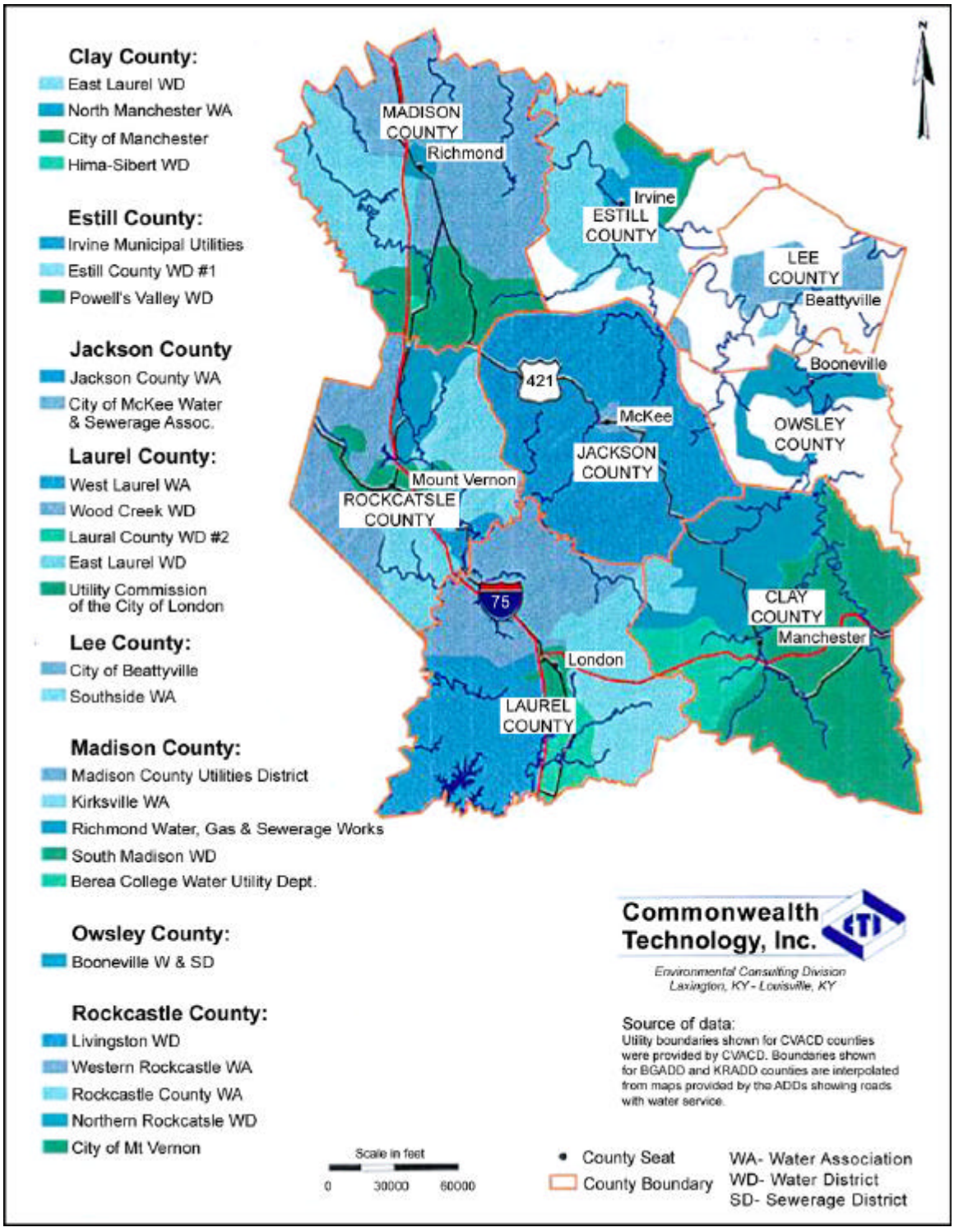


Figure 1.2-2. Water Utilities in Jackson and Surrounding Counties

City of McKee and McKee Reservoir

The McKee Reservoir is located on Bills Branch. Its drainage area is 685 acres, and the volume of the reservoir is 9.5 million gallons. The Natural Resources Conservation Services (NRCS) has recently completed the dam for a new reservoir upstream of the current McKee Reservoir. Its name is MPS #1 (Multi-Purpose Structure) and it will be available for municipal water supply once the water is impounded. At the top of the dam, the area of the reservoir will be 34.6 acres, with a drainage area of 563 acres. The volume of water available for municipal water supply will be 66 million gallons, with a yield of 271,000 gallons per day (gpd).

The City of McKee service area is the incorporated limits of McKee. Currently, the City of McKee provides water to 583 residential users, including apartments, and 121 commercial and public customers. The City of McKee also serves the fully-developed 10-acre McKee Industrial Park, which has three industrial customers.

1.2.1.1 HISTORICAL DEMANDS

The historical number of water customers in Jackson County was determined from the number of residential accounts of JCWA and the City of McKee. These values are shown in **Table 1.2-1**.

Table 1.2-1. Residential Water Accounts for Jackson County

Year	JCWA	City of McKee
1990	1,989	No data
1991	2,188	No data
1992	2,394	No data
1993	2,509	No data
1994	2,678	252
1995	2,910	No data
1996	3,000	511
1997	3,356	551
1998	3,466	583

Jackson County Water Association (JCWA)

JCWA has experienced annual growth rates of new customers ranging from three to twelve percent over the last nine years. The average rate of new accounts is seven percent.

Two sources of information address the sufficiency of Tyner Lake as a water supply for JCWA. The first source is the Long Range Water Supply Plan (LRWSP) Phase I document prepared in 1992 by CVADD with input from the Kentucky Division of Water (KDOW). This document used the total lake volume and a maximum use rate of 611,000 gpd to determine that Tyner Lake

would provide 649 days of supply in the year 2010. The LRWSP stated that "the demand would have to increase drastically in order to cause problems."

A contrary opinion is expressed in the 1994 yield analysis performed by Kenvirons, Inc., JCWA's consulting engineer. According to this yield analysis, Tyner Lake would be inadequate in drought conditions by 1998. Additionally, they found that the average withdrawal rate from Tyner Lake should not exceed 700,000 gpd. At that rate, the lake can fluctuate 26 feet and the minimum water surface elevation would be at 1,224 feet above MSL, which would only allow intake at the 1,210-foot port. Their study did not take into account any water system expansion projects, industrial growth, or Jackson County's Empowerment Zone (EZ) designation.

According to monthly operating reports, the average monthly maximum withdrawal from Tyner Lake is 874,000 gpd. JCWA pumps from Tyner Lake over 250,000 gpd more than the use rate calculated in the LRWSP and over 170,000 gpd more than the rate recommended by Kenvirons, Inc. This data supports the assertions of the JCWA that they are at or above capacity of their lake.

City of McKee

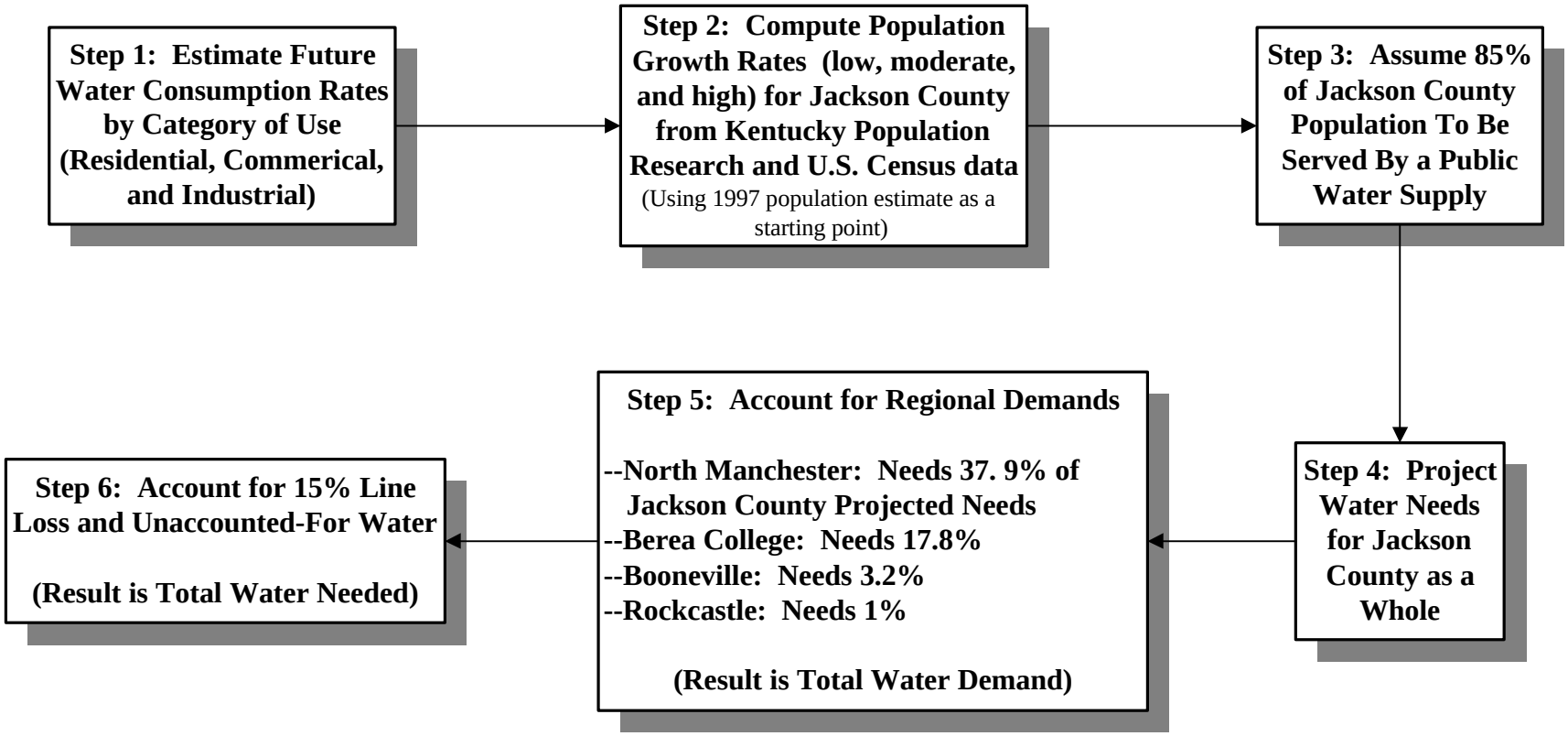
McKee has experienced annual growth of six to eight percent since 1996. The average growth rate is seven percent. Growth rate of water customers is not necessarily correlated with population growth. Water line extensions and hook-up by existing residents account for most of the large numbers of new customers.

According to the LRWSP, the McKee Reservoir and treatment plant are insufficient to meet current water demand. The LRWSP used a maximum use rate of 188,000 gpd for calendar year 2010 to determine McKee's insufficiencies. According to monthly operating reports on file with KDOW for calendar year 1998, the average monthly maximum withdrawal from McKee Reservoir was 201,600 gpd. The City of McKee pumps more than 13,000 gpd above the use rate for long-range water supply planning. The MPS #1 reservoir will provide relief for the McKee reservoir.

1.2.1.2 PROJECTED DEMANDS

To quantify water needs from now until the year 2050, two types of data are needed. The first type is water consumption rates per customer; the second is population projections. Both of these are subject to many factors that can either increase or decrease. Some factors affecting water use and population projections include the economic situation, improved technology, improved transportation systems, and job availability. As a result of the variation in water use and population size, ranges of plausible projections were used to determine potential future water needs in Jackson County. A complete account of the analyses and accompanying calculations is provided in Appendix E, *Water Needs Analysis*, of this EIS (MEG, 1999c). The main steps involved in calculating the water needs of Jackson County are shown in **Figure 1.2-3**. A more detailed depiction of the process is provided in **Figure 1.2-5** at the end of this section.

JACKSON COUNTY LAKE PROJECT
LOCAL AND REGIONAL WATER NEEDS PROJECTIONS TO 2050*



*The data and figures upon which water needs projections were based were obtained in 1998 and 1999. Specific amounts are subject to change and should be considered representative.

Figure 1.2-3. Overview of Water Needs Projections Process

1.2.1.2.1 Projected Water Consumption Rates

Three categories of water consumption were analyzed in the water needs analysis: residential consumption (households), commercial consumption (large offices), and industrial (factories). Water use rates were calculated for each of these categories.

For residential consumption, the amount used per person in a given time interval (the "per was computed. The per capita use rate used for the analysis was 67 gallons per person per day. This value was computed from data compiled from the Kentucky Public Service Commission's (PSC) Annual Report Statistics Summaries for 1994 through 1997. These reports contain water consumption data for every water district, water association, and privately-owned water supplier in the state.

Due to wide variations in commercial use, three per capita commercial use rates were selected:

- **Low**: 25 gallons per person (employee) per day, the average JCWA commercial use rate, 1989 through 1997;
- **Moderate**: 30 gallons per person per day, a moderate increase from the historical JCWA commercial use rate; and
- **High**: 50 gallons per person per day, approximately the average commercial use rate reported to the PSC by private water companies, which serve moderate to large population centers in Kentucky.

For industrial consumption, water use rates were based on the number of gallons used per acre of each industrial park per day. Only developed acres in industrial parks are served by a water provider. Jackson County has three industrial parks. Their total acreage, developed acreage, and water providers are shown in **Table 1.2-2**. The McKee Industrial Park is served by the City of McKee and all acres are developed. Both the Northern Jackson County Industrial Park and the Jackson County Regional Industrial Park are partially developed and are served by JCWA. The Industrial Authority of Jackson County is planning to purchase an additional 55 acres specifically for the Jackson County Regional Industrial Park, and approximately 100 acres of additional industrial land is anticipated to be needed in the county by 2050. This additional 100 acres would be obtained partly by developing currently undeveloped industrial land within the industrial parks and partly by purchasing new land to expand the existing parks.

Table 1.2-2. Industrial Parks in Jackson County

Industrial Park Name	Total Size (Acres)	Currently Developed and Serviced Land (Acres)	Water Provided By
Jackson County Northern Industrial Park	62.87	23	JCWA
Jackson County Regional Industrial Park	104	53.4	JCWA
McKee Industrial Park	10	10	City of McKee
Additional Acreage Projected[1]	155	0	JCWA

[1]As projected by Jackson County-McKee Industrial Development Authority by 2050 (Purkey, 2000b).

Based on industrial water usage computed by JCWA, the average industrial rate for the combined developed park acreage in the JCWA service area over the past six years was 98 gallons per acre per day (gpapd). This rate is reflective of low-water-use industries for many industrial parks, which is probably due to the types of industries that typically locate in areas of minimal infrastructure.

Accordingly, three industrial water use rates were used to predict future water use for Jackson County:

- **Low**: 100 gpapd, approximately the JCWA historical average;
- **Moderate**: 200 gpapd, twice the historical average of the JCWA, reflecting the limitations of wastewater treatment in the County; and
- **High**: 1,000 gpapd, the value cited in the Louisville and Jefferson County Metropolitan Sewer District (MSD) Design Manual.

Table 1.2-3 shows the projected industrial water use through 2050. There are approximately 90 acres remaining for industrial development in Jackson County. Industrial water use is projected to increase through 2050 as additional industries move into Jackson County or as current industries expand their operations. Jackson County's EZ designation could cause rapid industrial growth by the year 2005. Accordingly, it was assumed that approximately 85 additional acres of industrial land, consisting of both undeveloped land within the parks and additional land planned to be purchased, would be developed by 2005, and an additional 20 acres would be developed every 5 years between 2005 and 2035 as residual effects of the EZ designation. The remaining 30 acres of the projected 155 additional acres needed for the County were evenly distributed over the remaining portion of the planning period.

Table 1.2-3. Projected Industrial Water Use Through 2050

Year	Acres Developed and Serviced	Industrial Use (gallons per year)		
		Low	Moderate	High
2000	96.87	9,687	19,374	96,870
2005	171.87	17,187	34,374	171,870
2010	191.87	19,187	38,374	191,870
2015	211.87	21,187	42,374	211,870
2020	231.87	23,187	46,374	231,870
2025	251.87	25,187	50,374	251,870
2030	271.87	27,187	54,374	271,870
2035	291.87	29,187	58,374	291,870
2040	301.87	30,187	60,374	301,870
2045	311.87	31,187	62,374	311,870
2050	321.87	32,187	64,374	321,870

1.2.1.2.2 Population Projections

Three estimates of future population in Jackson County were used in the *Water Needs Analysis*: low, moderate, and high growth (MEG, 1999c). Population projections were made for the year 2000, and for every fifth year thereafter to 2050. Projections were provided by the Kentucky Population Research Center, the official source for population projections in Kentucky, for the years 2000, 2010, and 2020. For the years 2005 and 2015, linear interpolation was used.

Low population projections were developed from U.S. Census data, specifically, the 1990 Census count and 1997 estimate of total people in Jackson County. The exponential growth rate of the census projection from 1990 to 2020 was determined to be approximately 0.5 percent per year and was used to project population to 2050.

The moderate population projection started at the 1997 population estimate (12,829), and then allowed the population to grow exponentially at a rate of 1 percent per year. An alternative starting point for projections, year 2000 population, was considered in the *Water Needs Analysis*, but was rejected on the basis that it underestimated true population size (MEG, 1999c).

High population projections started at the 1997 population estimate and used an exponential growth rate of 1.3 percent. This was the growth rate of nearby Pulaski County from 1960 to 1990, which experienced significant economic development in these decades. Jackson County could experience a similar growth rate if EZ initiatives provide increased job opportunities.

Low, moderate, and high population projections are shown in **Table 1.2-4**. For the purposes of this study, it was assumed that 85 percent of the Jackson County population will be served by a public water supply by 2000, which is the maximum coverage projected by a representative of the Kentucky Rural Water Association (MEG, 1999c). The current estimate of coverage is 70 percent. Using the maximum coverage estimate accounts for the maximum possible increase in the number of customers by the year 2000.

Table 1.2-4. Population Projections for Jackson County

Year	Low Growth	Moderate Growth	High Growth
1997	12,829	12,829	12,829
2000	13,189	13,218	13,336
2005	13,618	13,892	14,226
2010	14,046	14,601	15,175
2015	14,333	15,345	16,187
2020	14,619	16,128	17,267
2025	14,911	16,951	18,419
2030	15,209	17,816	19,647
2035	15,513	18,724	20,958
2040	15,823	19,679	22,356
2045	16,140	20,683	23,848
2050	16,462	21,738	25,439

1.2.1.3 REGIONAL DEMANDS

Table 1.2-5 shows possible needs in surrounding counties for a new raw water source situated in Jackson County. This information was provided by the ADDs in this region, Rural Development personnel, and utility employees. Some of the smaller water associations and districts are excluded from the discussion due to their geographical separation from Jackson County (MEG, 1999c).

Table 1.2-5. Regional Need for a New Raw Water Source in Jackson County, Kentucky

County	Water Utility	Rely On Lake For Water Supply?	Comments
Clay	North Manchester Water Association	YES	They would like to get water from Jackson County.
Estill	Irvine Municipal Water and Estill County Water District	NO	They are not looking for a new source.
Laurel	Wood Creek Water District	NO	They have adequate supply.
Lee	Beattyville Water Works	NO	Although they currently buy 200,000 gallons per month from JCWA, they are planning to build their own reservoir. The preliminary engineering report is complete.
Madison	City of Richmond, Madison County Utilities Service, & Kirksville Water Association	NO	Richmond is too far north to be interested in a lake in Jackson County.
Madison	Berea College Water Utility Department & Southern Madison Water Association	MAYBE	They need additional supply. If the lake location is close to Madison County and if the cost of water is reasonable, then yes. Otherwise, Berea College will pursue plans to build a fifth reservoir.
Owsley	Booneville Water & Sewer District	YES	There would be lots of opportunities to expand their system. They also think the lake would be important as a reserve.
Rockcastle	Rockcastle County Water Association	YES	They currently rely on JCWA and would continue to do so.

Three water utilities expressed an interest in a new raw water source in Jackson County, and Berea College Water Utility Department would consider relying on a new lake to supplement

their water supply. Planning level quantification of the out-of-county demand is based on the following assumptions:

1. North Manchester Water Association currently buys approximately 200,000 gpd of water from the City of Manchester. The City of Manchester produces about 1.8 million gallons per day (mgd) and experienced a shortage in 1998. Both utilities are interested in an additional water source. Clay County is projected to need 5 mgd in the year 2030, with approximately 550,000 gpd (11 percent) allocated to North Manchester. As this represents 37.9 percent of the Jackson County year 2030 need, 37.9 percent was added to the Jackson County projections to account for projected water needs of North Manchester Water Association.

2. Berea College currently has four water supply reservoirs. A potential fifth reservoir was assumed to add 20 percent to their capacity. Berea College provides water to a population of 11,400, 20 percent of which is 2,288 people. This represents 17.8 percent of Jackson County population; therefore, 17.8 percent was added to the Jackson County water need to account for projected water need for Berea.

3. Booneville withdraws water from the South Fork of the Kentucky River. The LRWSP for Owsley County found this supply to be inadequate during drought conditions. They have indicated that a back-up supply would be beneficial during a drought, and would allow them to expand their distribution system. An additional water need of 10 percent was assumed, which corresponds to 3.2 percent of the projected Jackson County need in the year 2000. Other utilities drawing water from the Kentucky River may also benefit from a backup supply.

4. Rockcastle County Water Association purchased 1.7 million gallons of water in 1995 from JCWA. Rockcastle County Water Association needs are not expected to greatly increase. 1.7 million gallons is approximately 1 percent of the current Jackson County water demand.

The sum of these demands is 59.9 percent; therefore, the rounded value of 60 percent was added to the Jackson County water need, starting in the year 2000.

1.2.1.4 PROJECTED WATER NEEDS

Water demand scenarios were computed by multiplying each population growth projection by 0.85 to represent the population served by a public water supply, then multiplying by the sum of the residential and commercial per person use rates. This product was then added to the industrial water demand, and the resulting sum was increased by 60 percent (the regional demand) to achieve the total water demand. The total water needed was computed by dividing the water demand by 0.85 to account for 15 percent line loss and unaccounted water. **Table 1.2-6** shows the water demand scenarios used to compute water needs. A summary of the process used to compute water needs projections is shown in **Figure 1.2-5**.

Table 1.2-6. Water Demand Projection Scenarios for Jackson County			
	Low Growth	**Moderate Growth**	**High Growth**
Population Growth	0.5 %	1 %	1.3%
Residential (gallons/person/day)	67	67	67
Commercial (gallons/person/day)	25	30	50
Industrial (gallons/acre/day)	100	200	1000
Regional Need	60 %	60 %	60 %

Water needs projections are summarized in **Table 1.2-7**, and shown in **Figure 1.2-4**. For computation details, refer to the *Water Needs Analysis* (MEG, 1999c), provided in this EIS as Appendix E.

Table 1.2-7. Summary of Jackson County and Regional Water Demand (mgd)			
Year	**Low Growth**	**Moderate Growth**	**High Growth**
2000	2.0	2.1	2.7
2050	2.6	3.5	5.4

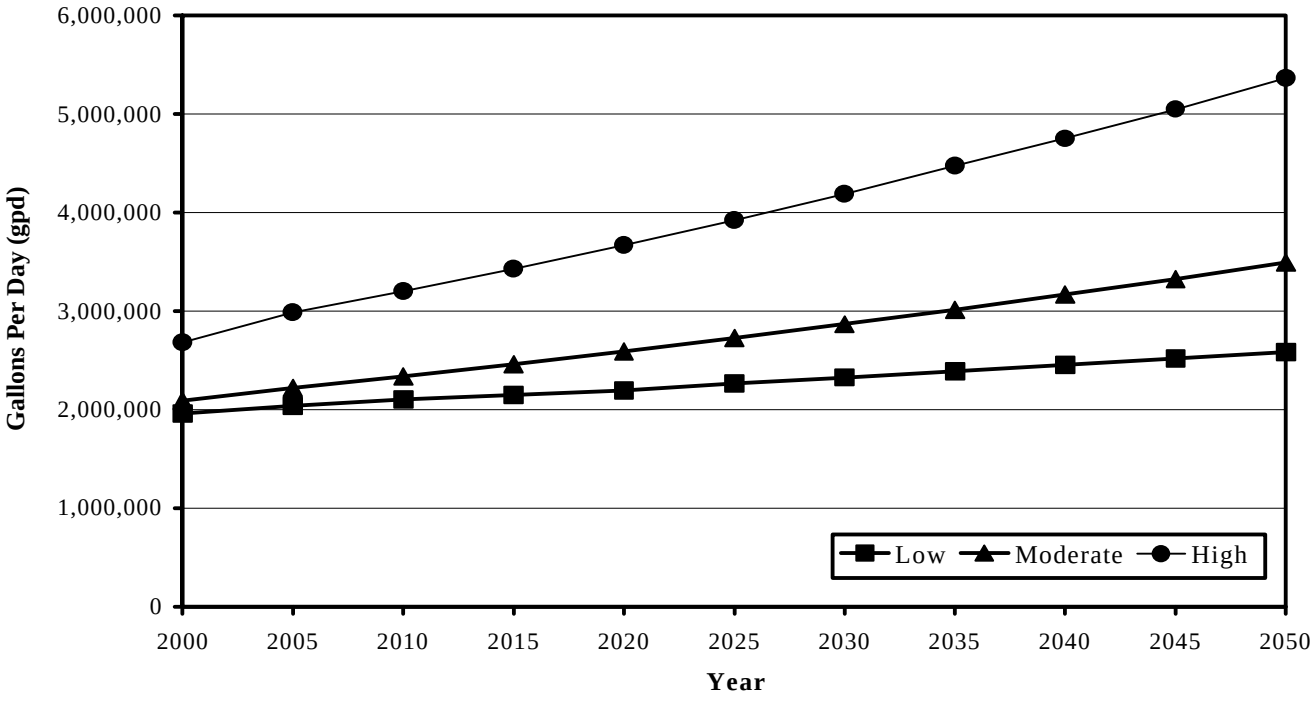


Figure 1.2-4. Projections for Jackson County and Regional Water Needs

JACKSON COUNTY LAKE PROJECT
LOCAL AND REGIONAL WATER NEEDS PROJECTIONS TO 2050

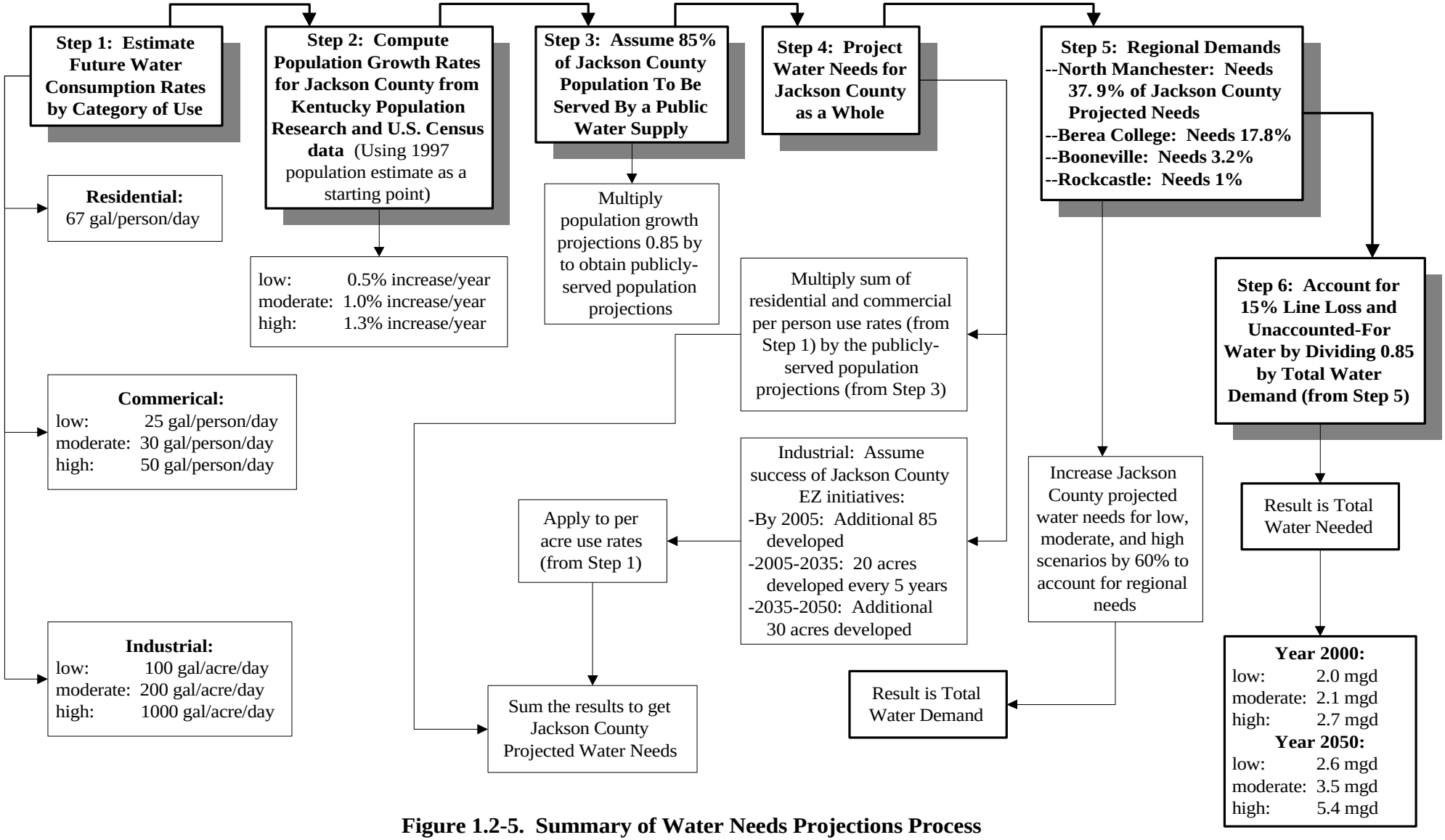


Figure 1.2-5. Summary of Water Needs Projections Process

1.2.2 RECREATION NEEDS

Section 1.2.2 summarizes information and data presented in the *Recreational Needs Analysis for the Proposed Jackson County Lake Project*, prepared by The Mangi Environmental Group, Incorporated, February 1999. This analysis is provided in this EIS as Appendix F. The purposes of this analysis were to determine the present and future recreational needs in the area of the proposed Jackson County reservoir, to assess the potential of such a reservoir to meet these recreational needs, and to estimate the level of usage the proposed reservoir might expect. A 75-mile radius around Jackson County was used to represent a reasonable driving distance and recreation supply study area for this analysis.

Future recreational development around the proposed Jackson County lake may include a public boat dock, boat ramps, picnic, camping, and swimming areas, and a public beach. To quantify the facility supplies and needs of these and other recreational activities in the study area during the 1989-1994 planning period, data from the 1989 Kentucky Statewide Comprehensive Outdoor Recreation Plan (SCORP) were used (MEG, 1999a). **Table 1.2-8** summarizes these data. A "0" in the deficiency column indicates a surplus of facilities.

Table 1.2-8. Recreational Facility Supplies and Needs in the Study Area, 1989-1994

Activity (unit)	1989		1994
	Supply	Deficiency	Deficiency
Camping (sites)	4,780	3,284	3,635
Picnicking (tables)	6,907	1,797	2,206
Hiking (miles)	283	52	66
Fishing (acres)	93,643	0	0
Boating (acres)	91,679	0	0
Water Skiing (acres)	65,060	0	0
Canoeing (miles)	1,954	0	0
Swimming (100 sq. ft)	4,427	7,467	7,988
Swimming (acres)	13	22	24

As shown by the results, during the planning period of 1989-1994, surplus facilities existed for fishing, boating, water skiing, and canoeing in the study area of this analysis, while there were unmet needs for camping, picnicking, and swimming facilities.

Based on the 1989 SCORP analysis, projections of future recreational needs were made directly using estimated population growth projections from Kentucky Population Research (KPR). Due to uncertainties of future population changes, three growth scenarios were considered for analysis: low, moderate, and high. Under the low growth scenario, population in the study area is expected to decline by 0.11 percent from 2000 to 2010 and by 1.55 percent by the year 2020. Under the moderate growth scenario, population is projected to increase by 2.77 percent from 2000 to 2010 and by 3.51 percent by the year 2020. Under the high growth scenario, population would increase 8.25 percent by the year 2010 and 13.89 percent by the year 2020. Although the efforts of the Kentucky Highlands EZ may affect population growth in Jackson County, such

effects are unlikely to significantly change the overall population of the study area (MEG, 1999a).

The 1989 demand for recreational facilities was determined by adding the facilities supplies and needs from the SCORP data. Using this demand as the baseline, recreational demands in the study area were projected for the years 2000, 2010, and 2020 under low, moderate, and high growth conditions. Needs were calculated by subtracting the 1989 supply from the projected demands. calculation details are provided in the *Recreational Needs Analysis for the Proposed Jackson County Lake Project*, provided as Appendix F of this EIS (MEG, 1999a). The results are summarized in **Table 1.2-9**. A "0" in the need column indicates a surplus of facilities.

Table 1.2-9. Projected Recreational Needs in the Study Area under Low, Moderate, and High Population Growth Conditions (2000-2020)

Activity (unit)	Year 2000 Need			Year 2010 Need			Year 2020 Need		
	Low	Mod	High	Low	Mod	High	Low	Mod	High
Camping (sites)	2,801	3,144	3,668	2,749	3,332	4,317	2,605	3,363	4,778
Picnicking (tables)	1,276	1,645	2,212	1,219	1,849	2,912	1,064	1,883	3,410
Hiking (miles)	32	46	68	30	54	95	24	55	114
Fishing (acres)	0	0	0	0	0	0	0	0	0
Boating (acres)	0	0	0	0	0	0	0	0	0
Water Skiing (acres)	0	0	0	0	0	0	0	0	0
Canoeing (miles)	0	0	0	0	0	0	0	0	0
Swimming (100 sq. ft.)	6,755	7,260	8,034	6,677	7,538	8,991	6,466	7,584	9,671
Swimming (acres)	20	22	24	20	23	27	19	23	29

The results show that even under high growth conditions, facilities for fishing, boating, water skiing, and canoeing will remain in surplus to 2020. Based on the amount of surplus, the current supply will adequately meet the demand for these activities in the study area beyond the year 2020 (MEG, 1999a). However, there will be increasing needs for additional camping, picnicking, hiking, and swimming facilities in the future. Based on the current facility plans, the proposed Jackson County lake would help meet some of the needs for picnicking facilities, and all of the needs for swimming facilities, which is projected to reach a maximum of only 29 acres for the planning period.

To estimate the amount of usage a new lake in Jackson County might experience, the amount of usage of other lakes of varying sizes in the study area was examined (MEG, 1999a). **Table 1.2-10** shows the limited available data from the lakes in the study area.

At the time of the recreational needs analysis, the potential size of a Jackson County reservoir was between 300 and 1,200 acres, depending on its location. Therefore, nominal surface area sizes of 300, 600, 900, and 1,200 acres were used to predict possible lake usage (MEG, 1999a). **Table 1.2-11** summarizes these potential usage estimates. Calculation details can be found in Appendix F of this EIS. Martins Fork Lake was the model for a projected 300-acre lake in Jackson County. The average of Martins Fork Lake and Carr Fork Lake was used as the model for a 600-acre lake. The average of Carr Fork Lake and Dewey Lake was used as the model for a 900-acre lake. And finally, the average of Dewey Lake, Paintsville Lake, and Buckhorn Lake was used to estimate usage for a 1,200-acre lake.

Table 1.2-10. Available Visitation Data From the Lakes in the Study Area				
Name	**Size (Acres)**	**Miles from Jackson County**	**1997 Visitor Hours***	**1997 Visits****
Martins Fork Lake	340	58	400,000	200,000
Carr Fork Lake	750	55	1,521,300	544,300
Dewey Lake	1,100	72	2,827,646	831,378
Paintsville Lake	1,140	65	2,497,341	832,445
Buckhorn Lake	1,230	30	1,434,200	282,600
Laurel River Lake	5,600	32	800,000	300,000
Green River Lake	8,200	70	9,997,100	943,700
Cave Run Lake	8,270	53	1,238,600	540,700
Lake Cumberland	50,250	67	76,400,000	4,900,000

*VISITOR HOUR - A visitor hour of use is the presence of one or more persons on an area of land or water for the purposes of engaging in one or more recreational activities. Visitor hours of use will not include time spent by people passing over, through, or along the project, where such travel is unrelated to recreational activities.

**VISITS - A "visit" is defined as one person visiting the project for recreation purposes for any period of time. For instance, one person sightseeing for 15 minutes is 1 visit; one person camping for 14 days is also one visit.

Table 1.2-11. Estimated Usage of Potential Jackson County Lake		
Size (acres)	**Average use per acre (visitor hours per year)**	**Projected Use (visitor hours per year)**
300	1,175	353,000
600	1,750	1,057,000
900	1,850	2,115,000
1,200	1,950	2,337,000

It was postulated that the number of visitor hours would change as the population in the surrounding areas changes. Therefore, population change projections for years 2000, 2010, and 2020 were applied to the estimates of visitor hours for each lake size. The results are presented in **Tables 1.2-12, 1.2-13,** and **1.2-14**. The figures shown are conservative; they do not attempt to factor in the potential growth of Jackson County as a result of the EZ.

Table 1.2-12. Estimated Lake Usage Based on Low Growth Projections			
Lake Surface Area (acres)	**Estimated Visitor Hours**		
	2000	**2010**	**2020**
300	319,000	318,000	314,000
600	1,100,000	1,099,000	1,083,000
900	1,783,000	1,781,000	1,755,000
1,200	2,113,000	2,110,000	2,080,000

Table 1.2-13. Estimated Lake Usage Based on Moderate Growth Projections			
Lake Surface Area (acres)	**Estimated Visitor Hours**		
	2000	**2010**	**2020**
300	332,000	341,000	344,000
600	1,146,000	1,178,000	1,186,000
900	1,856,000	1,908,000	1,922,000
1,200	2,200,000	2,261,000	2,278,000

Table 1.2-14. Estimated Lake Usage Based on High Growth Projections			
Lake Surface Area (acres)	**Estimated Visitor Hours**		
	2000	**2010**	**2020**
300	354,000	383,000	403,000
600	1,222,000	1,323,000	1,392,000
900	1,980,000	2,144,000	2,255,000
1,200	2,347,000	2,541,000	2,673,000

It was concluded that, even under low growth population projections, there would be considerable utilization of a lake in Jackson County, even if the lake is small (MEG, 1999a). However, it must be noted that these figures may be somewhat high in light of the current limited road access to Jackson County compared to the other facilities considered. Ongoing and anticipated highway improvements are changing this situation.