



**CUMBERLAND COUNTY
REGIONAL WATER SUPPLY STUDY**

**Preliminary Engineering Report
Executive Summary**



**U.S. Army
Corps of Engineers
Nashville District
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December 1998

**Cumberland County
Regional Water Supply
Preliminary Engineering Report**

Prepared For:

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EXECUTIVE SUMMARY

This Preliminary Engineering Report (PER) serves the purpose of a reconnaissance or pre-feasibility study. It is a preliminary study of the existing water supply conditions of Cumberland County and a preliminary investigation of water supply alternatives to supplement Cumberland County's existing water supply. The study was requested by Cumberland County.

An assessment of the county water supply needs was followed by data collection and a minimum level of field work with respect to topographic surveys, and soil and geologic investigations. Four possible growth scenarios were assumed which provide growth patterns based on (1) restricted growth, (2) historical growth, (3) a moderate increase to the historical trend, and (4) an unlimited increase to the historical trend. This estimated range of the future demand was used to provide a perspective of the feasibility of several different alternatives to supply additional water to the county. During a Feasibility Study / EIS process, a detailed Needs Assessment would be completed to define a single target water supply need. Table 1 provides a summary of the preliminary needs assessment.

Table 1
Results of Preliminary Needs Assessment

Growth Scenario	Preliminary Predicted Demand in 2050 (MGD)	Additional Water Supply Required in 2050 (MGD)
Limited	7.3	No Need
Historical	10.9	0.9
Median	13.1	3.1
Unlimited	68.3	58.3

¹ - Additional water supply required based on an estimated existing capacity of 10 MGD.

Six water supply alternatives were investigated:

- **Water Conservation**
- **Groundwater**
 - Five well sites located in Fentress and Overton Counties
- **Pipeline to large reservoir**
 - Watts Bar Lake
 - Center Hill Lake
 - Great Falls Lake
- **Storage Impoundments (New)**
 - Caney Fork
 - Meadow Creek (above Monterey Lake)
 - Meadow Creek (below Monterey Lake)
 - Meadow Park Lake (below existing dam)
 - Clear Creek

Storage Impoundments (Improvements to Existing)

Meadow Park Lake
Mayland Lake
Camp Ozone Lake
Tranquilechee Lake

- **Water Harvesting**
Traditional Method – Stream to constructed off-site impoundment
From Caney Fork to Meadow Park Lake
- **No Action**

Each alternative considered was sized to its maximum capacity for providing water supply. For those alternatives that require a target yield to be designed, such as a pipeline, 9 million gallons per day (MGD) was used as the target yield. This value was selected based on a previous water supply study the Tennessee Valley Authority (TVA) had performed. The selection of 9 MGD was made prior to the completion of this study's preliminary Needs Analysis so that the alternative analyses could begin in order to meet the study's short schedule. While 9 MGD may or may not be the required yield for the County, using it for all alternatives that required a target yield provided an equitable comparison of each.

Preliminary benefit-cost and financial analyses and environmental screening of the various identified solutions were included in this study. A summary of the preliminary alternative analysis, cost estimate and environmental screening is provided in Table 2.

It is the responsibility of the Cumberland County community and utility districts to refine and expand on the data contained herein through a detailed feasibility study, if so desired. Figure 1 describes the steps toward construction and final operation of a new water supply source(s). Possible options for proceeding into the feasibility phase include:

Option 1 – U.S. Army Corps of Engineers

Work with a Congressional delegation to seek appropriation and authority for the U.S. Army Corps of Engineers (Corps of Engineers) to fully investigate and provide a viable water supply to the Cumberland County region.

Option 2 - Support from Others

Obtain funding from other "outside" sources, such as Rural Utility Service for example. Under this option, the Corps of Engineers could provide planning and design services, as well as construction management on a cost reimbursable basis, if so desired.

Steps Toward a Water Supply Source

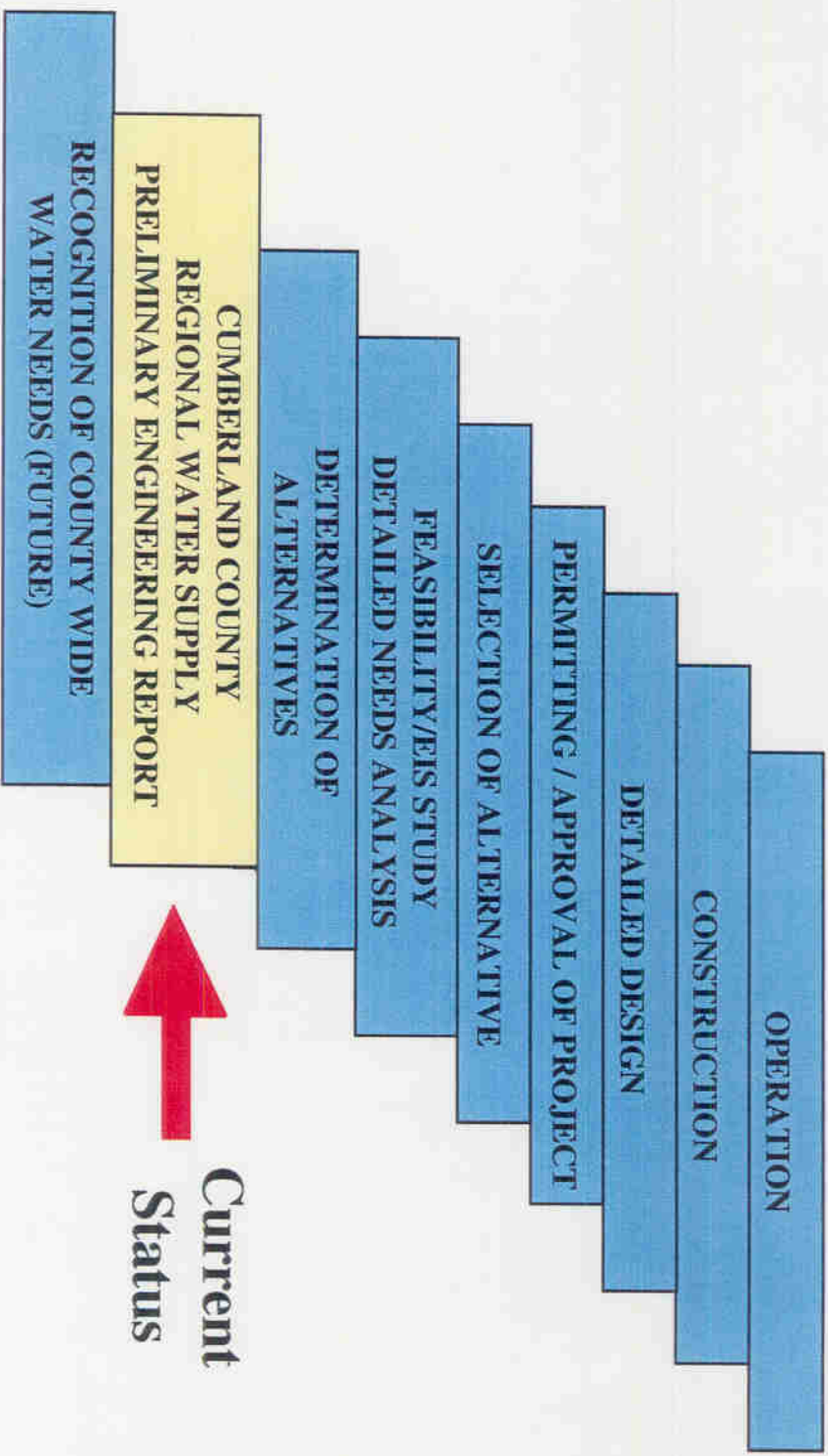
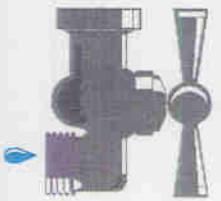


Figure 1 – Steps toward a Water Supply Source(s)

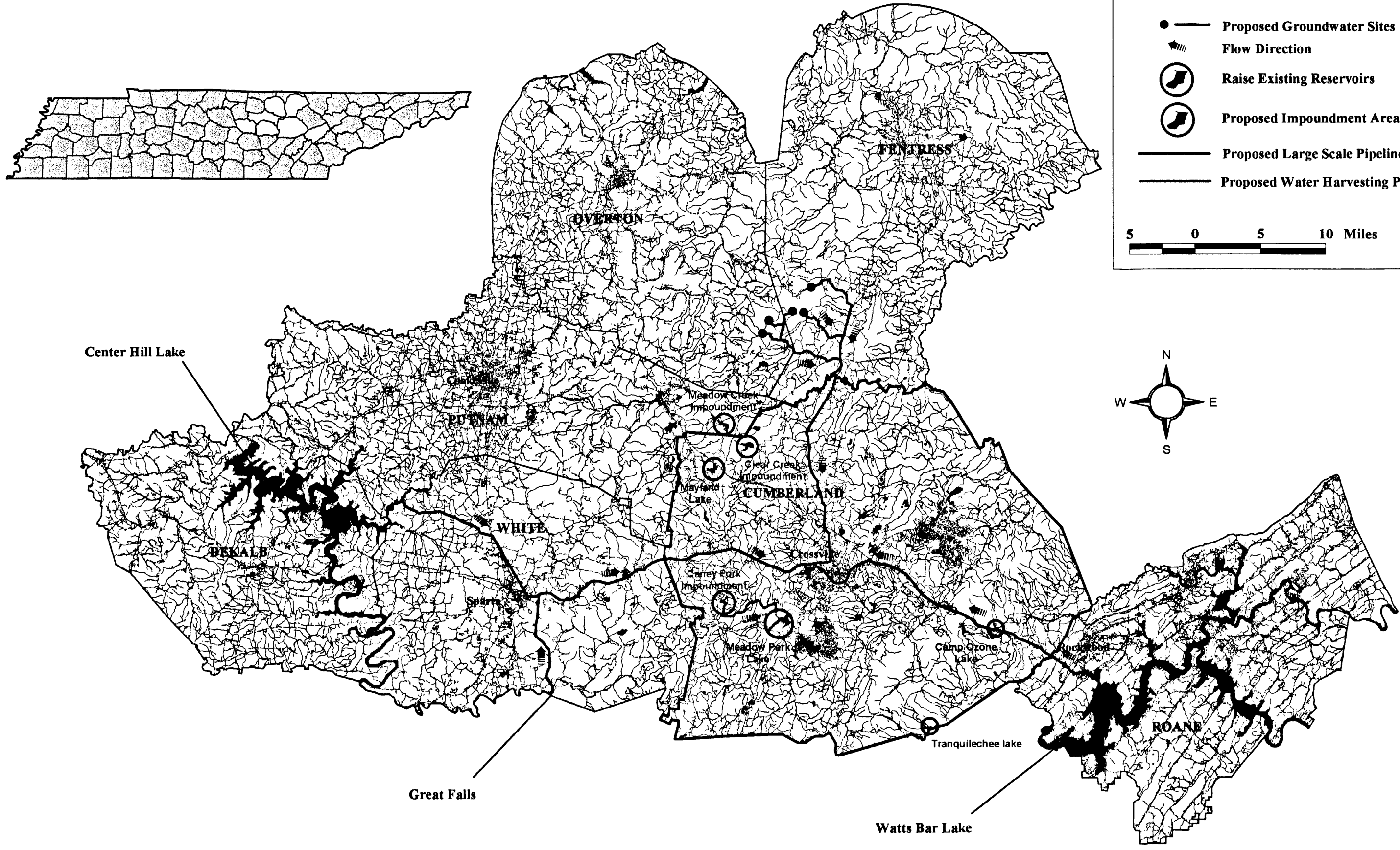
The Cumberland County community could also elect to choose an alternative based on this Preliminary Engineering Report and proceed independently with the design and permit process. However, the difficulties likely to be encountered in pursuing this approach, without detailed feasibility planning, to include the provisions of the National Environmental Policy Act (NEPA), are well documented.

Currently, officials from the six utility districts are discussing the formation of a central administrative body for the purpose of managing the regional water supply needs of the Cumberland County region. In the short term, this group could possibly look to the surrounding communities, such as the City of Monterey, for potential connections with existing water supply systems.

This Preliminary Engineering Report is intended to aid the community in planning for the long-term regional water supply needs of the Cumberland County region. Refer to Table 2 and Figure 2 for a complete summary of the preliminary alternative analysis, cost estimate, environmental screening, and location of alternatives.

Table 2
Alternative Summary Table

Alternative	Safe Yield (MGD)	Estimated Cost (Million Dollars)	Estimated Cost Per MGD (Million Dollars)	Assessment		Evaluate in Detail in EIS
				Engineering	Permit Actions	
Water Conservation	N/A	N/A	N/A	Positive	Positive	Yes
Groundwater						
	10.8	\$51.6	\$4.8	Neutral	Positive	Yes
Large Scale Pipeline						
<i>to Center Hill Lake</i>	9.0	\$38.4	\$4.3	Positive	Positive	Yes
<i>to Dale Hollow Lake</i>	N/A	N/A	N/A	Negative	Positive	No
<i>to Great Falls Lake</i>	9.0	\$33.5	\$3.7	Positive	Positive	Yes
<i>to Watts Bar Lake</i>	9.0	\$27.6	\$3.1	Positive	Positive	Yes
Improvements to Existing Reservoirs						
<i>Meadow Park Lake</i>	4.0	N/A	N/A	Negative	Neutral	No
<i>Mayland Lake</i>	2.0	N/A	N/A	Negative	Neutral	No
<i>Camp Ozona Lake</i>	1.0	N/A	N/A	Negative	Neutral	No
<i>Tanquechee Lake</i>	N/A	N/A	N/A	Negative	Neutral	No
New Impoundments						
<i>Clear Creek</i>	3.0	\$28.4	\$9.5	Positive	Negative	No
<i>Meadow Creek (above Meadow Creek Lake)</i>	N/A	N/A	N/A	Negative	Negative	No
<i>Meadow Creek (below Meadow Creek Lake)</i>	7.0	\$55.7	\$7.9	Positive	Negative	No
<i>Meadow Park Lake</i>	N/A	N/A	N/A	Negative	Negative	No
<i>Caney Fork</i>	12.0	\$63.5	\$5.3	Positive	Negative	No
Water Harvesting						
<i>Traditional Water Harvesting</i>	0.8	\$19.1	\$23.9	Positive	Positive	Yes
<i>Caney Fork to Meadow Park Lake</i>	8.0	\$42.7	\$5.3	Positive	Neutral	Yes



LEGEND

- Proposed Groundwater Sites
- Flow Direction
- Raise Existing Reservoirs
- Proposed Impoundment Area
- Proposed Large Scale Pipelines
- Proposed Water Harvesting Pipeline

5 0 5 10 Miles

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Figure 2 Potential Water Supply Alternatives