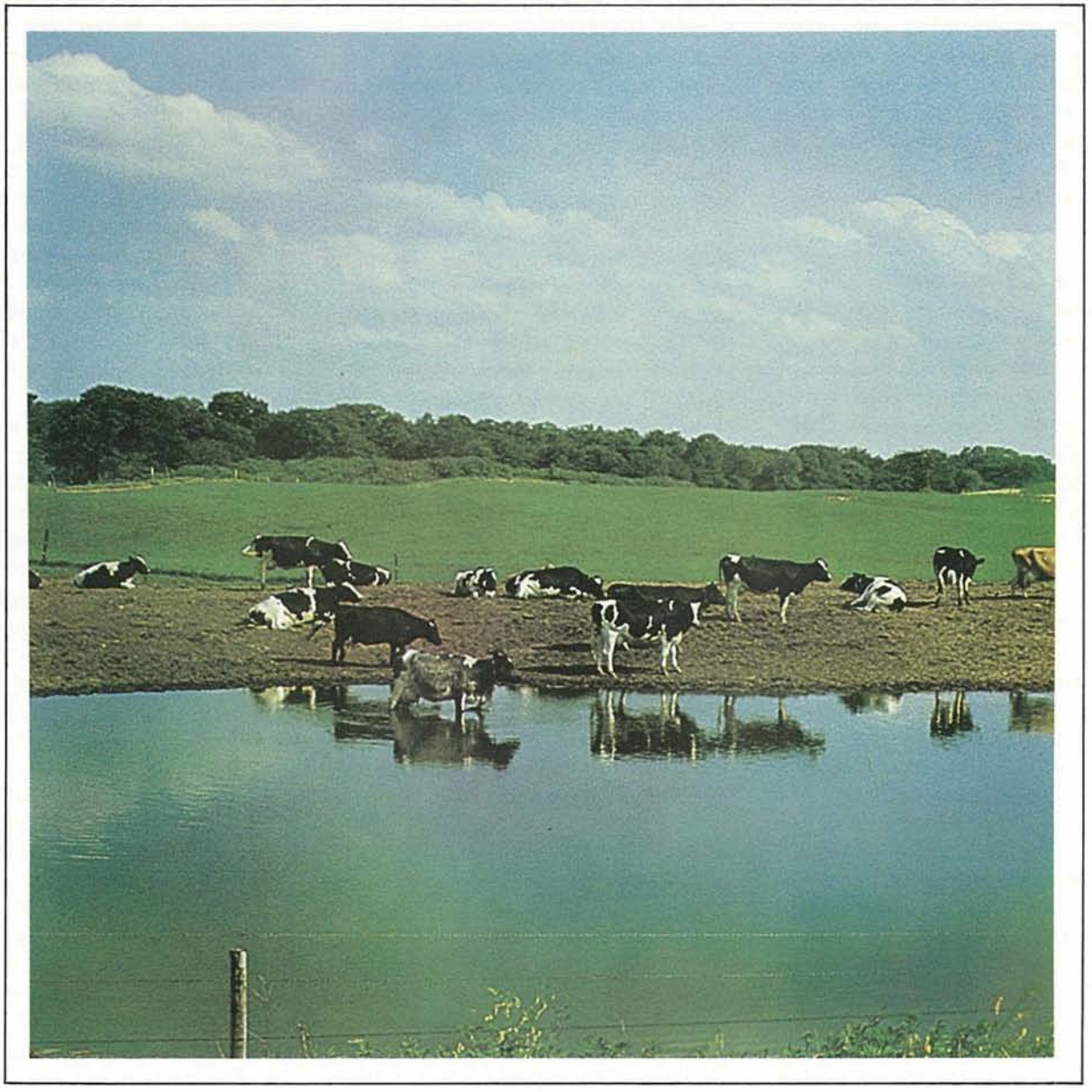
CHAPTER VII
EASTERN OKLAHOMA WATER SUPPLY STUDIES



PURPOSE

The studies discussed in this chapter incorporate in the plan the desires expressed by several eastern Oklahoma legislators, economic development organizations and segments of the general public regarding water resource development and serve to reassure those interests that any system proposed to convey water to the west would utilize only water exceeding the future water needs of eastern Oklahoma. The water supply system presented here for eastern Oklahoma is an expansion of the Regional Plans of Development included in the "Regional Analyses" (Chapter V.)

BACKGROUND

These studies were conducted as a response to criticism voiced following publication of Phase I of the Oklahoma Comprehensive Water Plan in 1975. Some eastern Oklahomans stated that the water requirement projections underestimated their area's potential for growth and industrial development. Concern was expressed that water necessary to meet the future needs of the area might be transported to other areas of the state, and thereby preclude future growth and economic development of eastern Oklahoma.

In early 1976, legislators from southeastern Oklahoma, substate planning district representatives, and members of the Planning Committee met at the State Capitol to discuss perceived shortcomings of Phase I of the Oklahoma Comprehensive Water Plan. At the meeting it was agreed that additional studies would be conducted in the Southeast Planning Region. This approach was later extended to the northeast 26 counties in conjunction with the Board's planning efforts in the northern 44 counties.

STUDY AREA

The 34 easternmost counties were chosen for their study area, which include the Board's Southeast, East Central and Northeast Planning Regions, plus Lincoln and Pottawatomie Counties. The study area includes the following substate planning districts: Eastern Oklahoma Development District (EODD), Kiamichi Economic Development District of Oklahoma (KEDDO), North Eastern Counties of Oklahoma (NECO), Indian Nations Council of Governments (INCOG), Central Oklahoma Economic Development District (COEDD), excluding Payne and Pawnee Counties, and the five easternmost counties of Southern Oklahoma Development Association (SODA).

COORDINATION

Coordination throughout the study was accomplished through meetings sponsored by the following substate planning districts: SODA, KEDDO, EODD, NECO and COEDD, and the Economic Resource Development Association (ERDA). The Economic Resource Development Association is an organization with a membership from 24 counties, formed in 1975 to promote and assist in the development of the economic, social and industrial potential in southeastern Oklahoma.

Population and water requirement projections for the Eastern Oklahoma Water Supply System are based upon meetings conducted by the Oklahoma Water Resources Board, the Corps of Engineers and the substate planning districts. Projections for the Indian Nations Council of Governments (INCOG) area are those developed in the Tulsa Urban Study by the Corps of Engineers, in coordination with INCOG and other study participants. Following finalization of these projections, alternative water supply plans were developed and submitted to ERDA and the substate planning districts for their review. A system was selected from the alternatives and is included as part of the Oklahoma Comprehensive Water Plan.

Full coordination and development of the water supply system for eastern Oklahoma are incomplete, pending agreement on details of the selected plan by EODD's Board of Directors. These details concern the reallocation of hydropower and inactive storage in Tenkiller Lake to water supply storage. Several EODD Board members were concerned that adverse impacts might be felt by local recreation interests during the irrigation season if increased diversions of irrigation water significantly lowered Tenkiller's water level. They questioned whether the economic benefits accruing from the proposed irrigation usage would exceed those realized from established recreation activities in the area and requested the preparation of a comparative analysis to assess relative recreation and irrigation benefits. If recreation benefits did indeed exceed irrigation benefits, they believed an alternative water supply source should be identified and included in the plan rather than utilizing Tenkiller for irrigation purposes.

The Tenkiller Lake restudy currently underway by the Corps of Engineers will be completed in 1982, and as it progresses the issues raised by EODD will be considered for inclusion in future revisions of the Oklahoma Comprehensive Water Plan. Appropriate public and professional participation in this study will ensure that the most economical and beneficial uses of the lake will be identified.

WATER SUPPLY SOURCES

Both stream water and ground water were considered as sources of supply in the study.

Stream water resources include existing, under construction, authorized and potential lakes. The Arkansas River below Keystone Lake was assumed to be usable as a water supply source, upon the assumption that the Arkansas River Basin Chloride Control Projects would be operational and economically feasible. Waters of the Arkansas could be utilized even without chloride control, but water of suitable quality would be available less frequently and at a greater cost. Utilization of offstream regulating reservoirs was considered necessary to provide a

FIGURE 116 EASTERN OKLAHOMA STUDY AREA YEAR 2040 PROJECTED WATER REQUIREMENTS (In 1,000 Af/Yr)

PLANNING REGION County	M & I[1]	IRRIGATION	TOTAL
SOUTHEAST			
Atoka	42.1	94.1	136.2
Bryan	151.5	268.8	420.3
Choctaw	27.2	169.1	196.3
Coal	54.7	39.9	94.6
Johnston	32.0	12.1	44.1
McCurtain	109.2	178.1	287.3
Pontotoc	71.8	183.2	255.0
Pushmataha	21.7	65.0	86.7
Subtotal	510.2	1,010.3	1,520.5
EAST CENTRAL			
Haskell	18.6	89.2	107.8
Hughes	10.1	6.9	17.0
Latimer	7.0	31.3	38.3
LeFlore	30.3	88.1	118.4
McIntosh	17.2	114.3	131.5
Okfuskee	12.7	2.9	15.6
Pittsburg	37.0	81.6	118.6
Seminole	240.4	2.6	243.0
Sequoyah	52.9	58.0	110.9
Subtotal	426.2	474.9	901.1
NORTHEAST			
Adair	17.0	24.3	41.3
Cherokee	53.7	39.6	93.3
Craig	12.1	4.6	16.7
Creek	31.9	5.6	37.5
Delaware	26.8	2.7	29.5
Mayes	96.5	3.5	100.0
Muskogee	84.9	180.8	265.7
Nowata	12.4	2.7	15.1
Okmulgee	51.8	105.0	156.8
Osage	9.0	18.2	27.2
Ottawa	40.1	1.6	41.7
Rogers	180.9	2.3	183.2
Tulsa	400.0	5.6	405.6
Wagoner	70.0	116.5	187.5
Washington	37.7	4.3	42.0
Subtotal	1,124.8	517.3	1,642.1
LINCOLN COUNTY[2]	11.3	17.4	28.7
POTTAWATOMIE COUNTY[3]	48.1	32.0	80.1
TOTAL	2,120.6	2,051.9	4,172.5

[1]Includes cooling water for power generation.
[2]Located in North Central Planning Region.
[3]Located in Central Planning Region.

dependable source of water supply from the Arkansas.

Major sources of ground water in the study area were identified as the Vamoosa, Roubidoux, Arbuckle and Antlers Sandstone ground water basins and various alluvium and terrace deposits. A minimum well yield of 200 gallons per minute (gpm) was assumed necessary before ground water was considered for municipal and industrial purposes, and a minimum 150 gpm yield was assumed necessary for irrigation purposes.

PROJECTED WATER REQUIREMENTS

Projections of water requirements, based on data provided by the substate planning districts and ERDA, totaled 4.2 million acre-feet annually by the year 2040. This compares with approximately two million acre-feet per year forecast by the Oklahoma Comprehensive Water Plan Planning Committee and used in developing the regional water development plans discussed in Chapter V. The major difference in the projections is the extensive amount of irrigation forecast by the substate districts and ERDA, which is not projected by the Planning Committee. These projections for the year 2040 are shown by planning region and county in Figure 116 .

Although developed individually, utility demands (consumptive water requirements for cooling at thermal electric generating plants) and industrial demands were combined with municipal demands into a single municipal and industrial demand component (M&I).

DEMAND CENTERS

When considering each municipality, rural water district, industrial complex, or utility demand area appropriate for inclusion in projections of future water requirements, it became apparent that many were components of an areawide system. Many towns and communities were discovered to be acquiring water from other and often larger entities via direct lines or a system of rural water districts. In considering the types of systems that would be serving eastern Oklahoma in the future, it became apparent that a network of rural water districts would probably be the most appropriate distribution system. In most cases, water furnished by rural water districts is treated water from a centralized facility. Since this study intended to develop alternative plans for the conveyance of water from sources to treatment facilities, with the exclusion of treatment and distribution facilities, it was difficult to determine whether or not some rural systems qualified as conveyance or distribution systems. The concept of providing individual treatment facilities for each entity would lead to a very

inefficient and high cost solution, thus it was considered appropriate to identify certain demand centers within each county as terminal locations for water conveyance facilities.

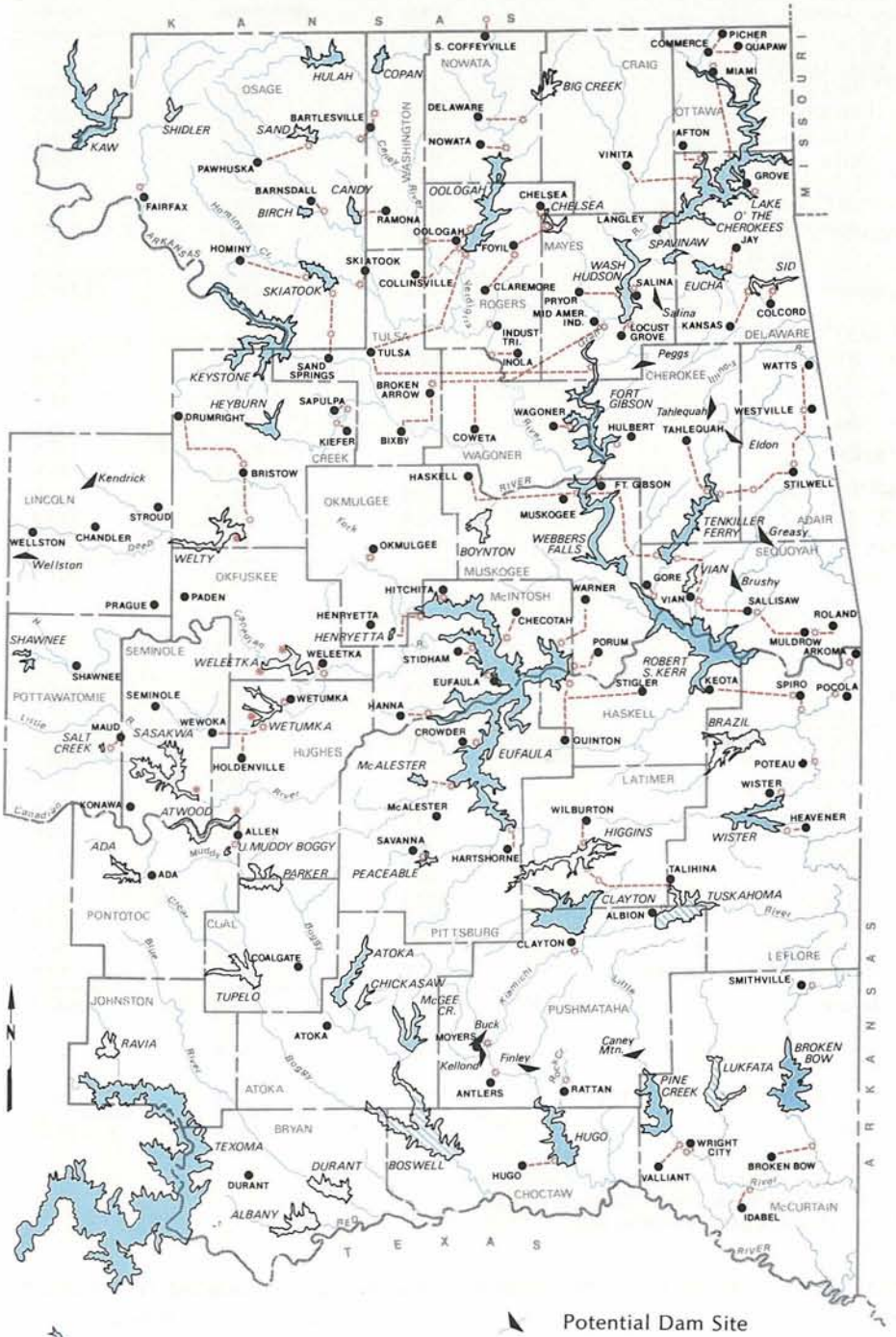
A demand center was identified as a city, a group of communities using a common water supply source, or an industrial or utility demand area having a projected water requirement of 1.0 mgd or greater by the year 2040. Exceptions were entities which were geographically isolated or located closer to a source than to a demand center.

Some demand centers possessed specific characteristics which made them unique. The Mid-American Industrial Complex in Mayes County, the source of treated water for the City of Pryor, was treated as a single demand center located at Pryor. The industrial triangle in southern Rogers County was also considered an industrial water demand center.

Although no future power generating plant sites were identified by utility company officials, a substantially increased utility demand was forecast for Seminole and Okfuskee Counties, the sites of existing plants. Therefore, utility demand centers were established near potential sources, under the assumption that when the need for additional power plants materializes, they would locate near available water sources instead of conveying water to the plant.

Irrigation demands were developed on a countywide basis and no specific demand centers or terminal points were identified. It was assumed that irrigation demands would first be met by utilizing ground water where it is available. Where ground water was not a viable source, stream water sources were considered, and the costs of irrigation water from stream water sources were included in the cost estimates. No specific plans were developed for the movement of irrigation water from sources or terminal points within a county to specific demand areas. If the supply was a stream water source outside the county, the cost of a transmission system to move the water into the county was included in the cost estimates.

FIGURE 117 EASTERN OKLAHOMA MUNICIPAL AND INDUSTRIAL WATER SUPPLY SYSTEM



Data—U.S. Army Corps of Engineers
Mapping—Oklahoma Water Resources Board

EASTERN OKLAHOMA WATER SUPPLY SYSTEM

The Eastern Oklahoma Water Supply System would require development of both ground water and stream water resources beyond that proposed in the Regional Plans of Development in order to meet the higher future water needs forecast by local planners. Sources of supply include existing, authorized and proposed reservoirs, the Arkansas River and additional ground water resources. The concept underlying the system presented here is an expansion of the Regional Plans of Development proposed for the Northeast, East Central and South Central Planning Regions. Costs of the Eastern Oklahoma Water Supply System include costs of the proposed Regional Plans of Development plus costs of additional development to meet the higher projected needs.

Municipal and Industrial Water Supply System

Figure 117 illustrated the water supply system proposed to meet the municipal and industrial water demands forecast by the local interests. As indicated in Figure , 10 reservoirs in addition to those proposed in the "Regional Analyses" would be required to supply 328,100 acre-feet of municipal and industrial water per year to the 34-county area. These reservoirs are: Big Creek and Chelsea in the Northeast Planning Region; Brazil, Higgins, and Peacable in the East Central Planning Region; and Ada, Chickasaw, Durant, Lukfata (authorized) and Ravia in the Southeast Planning Region.

Additional ground water supplies would also have to be developed to meet a portion of the municipal and industrial water needs. Approximately 42,000 acre-feet per year of additional ground water would supply Lincoln, Okfuskee, Pottawatomie and Seminole Counties.

The area's remaining municipal and industrial water demands would be met by water from existing reservoirs and those proposed in the "Regional Analyses". A greater portion of the yield from these sources would be utilized to meet the higher projected requirements in the Eastern Oklahoma Water Supply System than in the local plans proposed in the "Regional Analyses".

Municipal and industrial distribution facilities from the water sources to appropriate demand centers are also shown in Figure 117. The total municipal and industrial water demand for the three planning regions plus Lincoln and Pottawatomie Counties is projected to be approximately 2.1 million acre-feet by 2040. Figures 118, 119, 121 and 122 present the 34 counties in the study area along with their projected 2040 municipal and industrial water demands and proposed sources.

Irrigation Water Supply System

Figure 123 illustrates the irrigation component of the Eastern Oklahoma Water Supply System. This system would require the construction of one additional reservoir, Boynton Lake in Muskogee County, to serve as off-stream regulating storage for water diverted from the Arkansas River. Upon reallocation of storage, several of the existing and proposed reservoirs would be utilized for irrigation purposes, along with six of the 10 new reservoirs previously proposed. Where downstream releases would be made, the water would be diverted at the points shown in Figure 123. Ground water and SCS Lakes would supply most of the irrigation water along with water conveyed from major reservoirs, while Coal, Nowata and Latimer Counties would rely solely on major reservoirs for irrigation water.

Distribution facilities are presented for irrigation water supplied by reservoirs in adjacent counties. In the 34-county area, total irrigation requirements projected for the year 2040 are approximately two million acre-feet per year to irrigate two million acres.

Figures 118, 119, 121 and 122 show 2040 irrigation water requirements and proposed sources.

Costs

Preliminary cost estimated for the Eastern Oklahma Water Supply System are presented in Figure 120. Construction of the municipal and industrial component would cost approximately $950 million, while the cost of the irrigation system is estimated at nearly $2 billion. The

FIGURE 118 EASTERN OKLAHOMA WATER SUPPLY SYSTEM YEAR 2040 SUPPLY AND DEMAND ANALYSIS LINCOLN AND POTTAWATOMIE COUNTIES (In 1,000 Af/Yr)

Source	Pottawatomie[1]	Lincoln[2]
M & I Component		
Ground Water & SCS & Municipal Lakes	21.2	11.3
Southern Conveyance System	26.9	—
M & I Supply	48.1	11.3
Irrigation Component		
Ground Water & SCS Lakes	32.0	17.4
Irrigation Supply	32.0	17.4
TOTAL LOCAL SUPPLY	80.1	28.7
2040 DEMAND	80.1	28.7

[1]Located in Central Planning Region.

[2]Located in North Central Planning Region.

FIGURE 119 EASTERN OKLAHOMA WATER SUPPLY SYSTEM YEAR 2040 SUPPLY AND DEMAND ANALYSIS NORTHEAST PLANNING REGION (In 1,000 Af/Yr)

Source	Adair	Cherokee	Craig	Creek	Delaware	Mayes	Muskogee	Nowata	Okmulgee	Osage	Ottawa	Rogers	Tulsa	Wagoner	Washington	Total
Municipal and Industrial Component[1]																
Ground Water & SCS & Municipal Lakes[2]	—	22.4	—	3.5	0.1	—	11.4	4.6	8.9	5.0	—	6.9	153.8	—	11.1	227.7
Birch	—	—	—	—	—	—	—	—	—	1.1	—	5.6	—	—	—	6.7
Candy	—	—	—	—	—	—	—	—	—	0.1	—	7.7	—	—	0.8	8.6
Copan	—	—	—	—	—	—	—	—	—	—	—	—	—	—	15.0	15.0
Eufaula	—	—	—	—	—	—	1.9	—	8.0	—	—	—	—	—	—	9.9
Fort Gibson	—	0.7	—	—	—	—	7.8	—	—	—	—	—	165.0	50.3	—	223.8
Grand	—	—	12.1	—	14.2	96.5	—	—	—	—	40.1	—	20.4	19.4	—	202.7
Heyburn	—	—	—	20.7	—	—	—	—	—	—	—	—	—	—	—	20.7
Hulah	—	—	—	—	—	—	—	—	—	—	—	—	—	—	7.7	7.7
Oologah	—	—	—	—	—	—	—	—	—	—	—	101.4	33.7	—	—	135.1
Skiatook	—	—	—	—	—	—	—	—	—	1.2	—	26.4	26.8	—	—	54.4
Tenkiller	17.0	30.6	—	—	—	—	50.7	—	—	—	—	—	—	—	—	98.3
Sand	—	—	—	—	—	—	—	—	—	0.2	—	8.0	—	—	3.1	11.3
Shidler	—	—	—	—	—	—	—	—	—	1.2	—	—	—	—	—	1.2
Big Creek	—	—	—	—	—	—	—	7.6	—	—	—	4.7	—	—	—	12.3
Chelsea	—	—	—	—	—	—	—	—	—	—	—	20.2	—	—	—	20.2
Sid	—	—	—	—	12.2	—	—	—	—	—	—	—	—	—	—	12.2
Welty	—	—	—	7.7	—	—	—	—	34.9	—	—	—	—	—	—	42.6
Adjacent County	—	—	—	—	0.3	—	13.1	0.2	—	0.2	—	—	0.3	0.3	—	14.4
M & I Supply	17.0	53.7	12.1	31.9	26.8	96.5	84.9	12.4	51.8	9.0	40.1	180.9	400.0	70.0	37.7	1,124.8
Irrigation Component																
Ground Water & SCS Lakes	6.6	2.4	0.9	5.6	0.8	0.7	134.6	—	0.2	6.7	1.0	1.3	5.6	116.5	2.2	285.1
Grand	—	—	—	—	—	—	—	—	—	—	0.6	—	—	—	—	0.6
Tenkiller	17.7	37.2	—	—	—	—	46.2	—	—	—	—	—	—	—	—	101.1
Sand	—	—	—	—	—	—	—	—	—	—	—	—	—	—	2.1	2.1
Shidler	—	—	—	—	—	—	—	—	—	11.5	—	—	—	—	—	11.5
Big Creek	—	—	3.7	—	—	—	—	2.7	—	—	—	1.0	—	—	—	7.4
Boynton	—	—	—	—	—	—	—	—	104.8	—	—	—	—	—	—	104.8
Chelsea	—	—	—	—	—	1.1	—	—	—	—	—	—	—	—	—	1.1
Sid	—	—	—	—	1.9	1.7	—	—	—	—	—	—	—	—	—	3.6
Irrigation Supply	24.3	39.6	4.6	5.6	2.7	3.5	180.8	2.7	105.0	18.2	1.6	2.3	5.6	116.5	4.3	517.3
TOTAL LOCAL SUPPLY	41.3	93.3	16.7	37.5	29.5	100.0	265.7	15.1	156.8	27.2	41.7	183.2	405.6	187.5	42.0	1,642.1
2040 DEMAND	41.3	93.3	16.7	37.5	29.5	100.0	265.7	15.1	156.8	27.2	41.7	183.2	405.6	187.5	42.0	1,642.1

[1]Includes cooling water for (power) generation.

[2]Includes present use from federal reservoirs and 28,000 acre-feet of wastewater reuse in Tulsa County.

FIGURE 120 EASTERN OKLAHOMA WATER SUPPLY SYSTEM SUMMARY OF COSTS (In $1,000)

FACILITY	CONSTRUCTION COST	AVERAGE ANNUAL OMR&E	TOTAL AVERAGE ANNUAL EQUIVALENT COST
M & I Water Supply System			
Water Supply Storage	$ 558,593	$ 7,776	$ 40,213
Ground Water Development	8,247	694	1,183
Water Conveyance Facilities	374,100	19,001	40,812
Terminal Storage	7,800	124	642
Subtotal	$ 948,740	$27,595	$ 82,850
Irrigation Water Supply System			
Water Supply Storage[1]	$ 155,100	$ 1,783	$ 11,374
Ground Water Development	429,760	16,166	29,700
Water Conveyance Facilities	168,100	16,300	28,200
Distribution Facilities	1,242,500	4,129	37,431
Subtotal	$1,995,460	$38,378	$106,705
TOTAL	$2,944,200	$65,973	$189,555

[1]Includes cost of terminal irrigation storage in Southeast Region.

total construction cost for water supply storage, ground water development, water conveyance facilities and distribution facilities could be over $3 million, with an average annual equivalent cost of approximately $190 million. Estimates of annual mitigation/compensation costs have not been included in this analysis.

The first cost of projects contained in the "Regional Analyses" for this area is $870 million. Thus the costs of developing the resources necessary to supply the higher projections are about three-and-a-half times greater than those for the Regional Plans of Development proposed by the Planning Committee. As evident, the irrigation component constitutes the major portion of the overall construction costs due to the greater

amount of irrigation forecast in the substate planning projections.

CONTINUED PLANNING EFFORTS

As planning efforts progress toward developing the water resources necessary to meet eastern Oklahoma's future requirements, coordination must be maintained with eastern Oklahoma interests in order to benefit from their firsthand awareness of local problems and needs. As planning studies continue trends may confirm the accuracy of population and water requirement projections developed by local organizations. In such case, the water supply system proposed herein, which is an expansion of the Regional Plan of Development, would be capable of meeting those needs.

As federal, state and local efforts succeed in further development of the industrial potential of eastern Oklahoma, the demand for good quality water will increase. Adequate supplies must remain available to attract new interests and allow for the expansion of established industries.

Although eastern Oklahoma's abundant rainfall has limited the need for irrigation development and eastern Oklahoma soils are shallow and somewhat unresponsive to irrigation due to poor drainage, growing emphasis on agricultural production could possibly stimulate growth of large-scale, project-type irrigation. Preliminary analyses by the Bureau of Reclamation, identical to those used in the economic analysis for the water conveyance systems, indicate that an irrigation system investment would not be justified at current agricultural crop prices. Implementation of such a system could produce a negative per-acre return to the farmer in the Northeast Planning Region because the increased yields from irrigation are not sufficient to offset the higher equipment cost. In all other areas of eastern Oklahoma, the per-acre returns under irrigated conditions would be less than those under dryland conditions. Local irrigation projections appear excessive, but if

FIGURE 121 EASTERN OKLAHOMA WATER SUPPLY SYSTEM YEAR 2040 SUPPLY AND DEMAND ANALYSIS SOUTHEAST PLANNING REGION (In 1,000 Af/Yr)

Source	Atoka	Bryan	Choctaw	Coal	Johnston	McCurtain	Pontotoc	Pushmataha	Total
				Municipal and Industrial Component[1]					
Ground Water & SCS & Municipal Lakes[2]	5.2	1.0	1.0	3.0	13.0	0.9	6.7	—	30.8
Broken Bow	—	—	—	—	—	23.4	—	—	23.4
Hugo	—	—	26.2	—	—	—	—	—	26.2
Pine Creek	—	—	—	—	—	46.7	—	—	46.7
Clayton	—	—	—	—	—	—	—	11.2	11.2
McGee Creek	19.0	—	—	—	—	—	—	—	19.0
Lukfata	—	—	—	—	—	37.0	—	—	37.0
Tuskahoma	—	—	—	—	—	—	—	10.2	10.2
Ada	—	—	—	—	—	—	23.5	—	23.5
Albany	—	35.8	—	—	—	—	—	—	35.8
Chickasaw	17.9	—	—	—	—	—	—	—	17.9
Durant	—	114.7	—	—	—	—	—	—	114.7
Parker	—	—	—	20.5	—	—	26.5	—	47.0
Ravia	—	—	—	—	19.0	—	—	—	19.0
Tupelo	—	—	—	31.2	—	—	15.1	—	46.3
Local Streams	—	—	—	—	—	1.2	—	0.3	1.5
M & I Supply	42.1	151.5	27.2	54.7	32.0	109.2	71.8	21.7	510.2
				Irrigation Component					
Ground Water	94.1	249.1	169.1	—	12.1	178.1	183.2	65.0	950.7
Durant	—	19.7	—	—	—	—	—	—	19.7
Tupelo	—	—	—	39.9	—	—	—	—	39.9
Irrigation Supply	94.1	268.8	169.1	39.9	12.1	178.1	183.2	65.0	1,010.3
TOTAL LOCAL SUPPLY	136.2	420.3	196.3	94.6	44.1	287.3	255.0	86.7	1,520.5
2040 DEMAND	136.2	420.3	196.3	94.6	44.1	287.3	255.0	86.7	1,520.5

[1]Includes cooling water for power generation.

[2]Includes present use from federal reservoirs.

FIGURE 122 EASTERN OKLAHOMA WATER SUPPLY SYSTEM YEAR 2040 SUPPLY AND DEMAND ANALYSIS EAST CENTRAL PLANNING REGION (In 1,000 Af/Yr)

Source	Haskell	Hughes	Latimer	LeFlore	McIntosh	Okfuskee	Pittsburg	Seminole	Sequoyah	Total
					Municipal and Industrial Component[1]					
Ground Water & SCS & Municipal Lakes[2]	1.2	4.4	1.1	4.1	0.7	1.3	12.0	17.1	4.5	46.4
Eufaula	1.2	—	—	—	16.5	—	24.4	—	—	42.1
Tenkiller	—	—	—	—	—	—	—	—	62.8	62.8
Wister	—	—	—	7.8	—	—	—	—	—	7.8
Atwood	—	—	—	—	—	—	—	44.8	—	44.8
Brazil	16.2	—	—	14.7	—	—	—	—	—	30.9
Higgins	—	—	5.9	2.5	—	—	—	—	—	8.4
Peaceable	—	—	—	—	—	—	0.6	—	—	0.6
Sasakwa	—	—	—	—	—	—	—	135.5	—	135.5
Weleetka	—	—	—	—	—	6.1	—	25.1	—	31.2
Welty	—	—	—	—	—	5.0	—	—	—	5.0
Wetumka	—	5.7	—	—	—	0.3	—	17.9	—	23.9
Adjacent County	—	—	—	1.2	—	—	—	—	—	1.2
M & I Supply	18.6	10.1	7.0	30.3	17.2	12.7	37.0	240.4	67.3	440.6
					Irrigation Component					
Ground Water & SCS Lakes	55.7	6.9	—	64.0	0.2	2.9	6.3	2.6	58.0	196.6
Tenkiller	—	—	—	—	114.1	—	—	—	—	114.1
Wister	—	—	14.9	24.1	—	—	—	—	—	39.0
Brazil	33.5	—	—	—	—	—	—	—	—	33.5
Higgins	—	—	16.4	—	—	—	43.6	—	—	60.0
Peaceable	—	—	—	—	—	—	31.7	—	—	31.7
Irrigation Supply	89.2	6.9	31.3	88.1	114.3	2.9	81.6	2.6	58.0	474.9
TOTAL LOCAL SUPPLY	107.8	17.0	38.3	118.4	131.5	15.6	118.6	243.0	125.3	915.5[3]
2040 DEMAND	107.8	17.0	38.3	118.4	131.5	15.6	118.6	243.0	110.9	901.1

[1]Includes cooling water for power generation.

[2]Includes present use from federal reservoirs.

[3]Excess supply used to provide water to adjacent counties in Northeast Planning Region.

widespread irrigation were to become feasible, the irrigation system proposed in this chapter would be capable of meeting those needs.

It should be emphasized that development of the plans proposed in the "Regional Analyses" for eastern Oklahoma would not preclude expansion to the larger system requested by local interests in the future if such expansion were to become warranted.

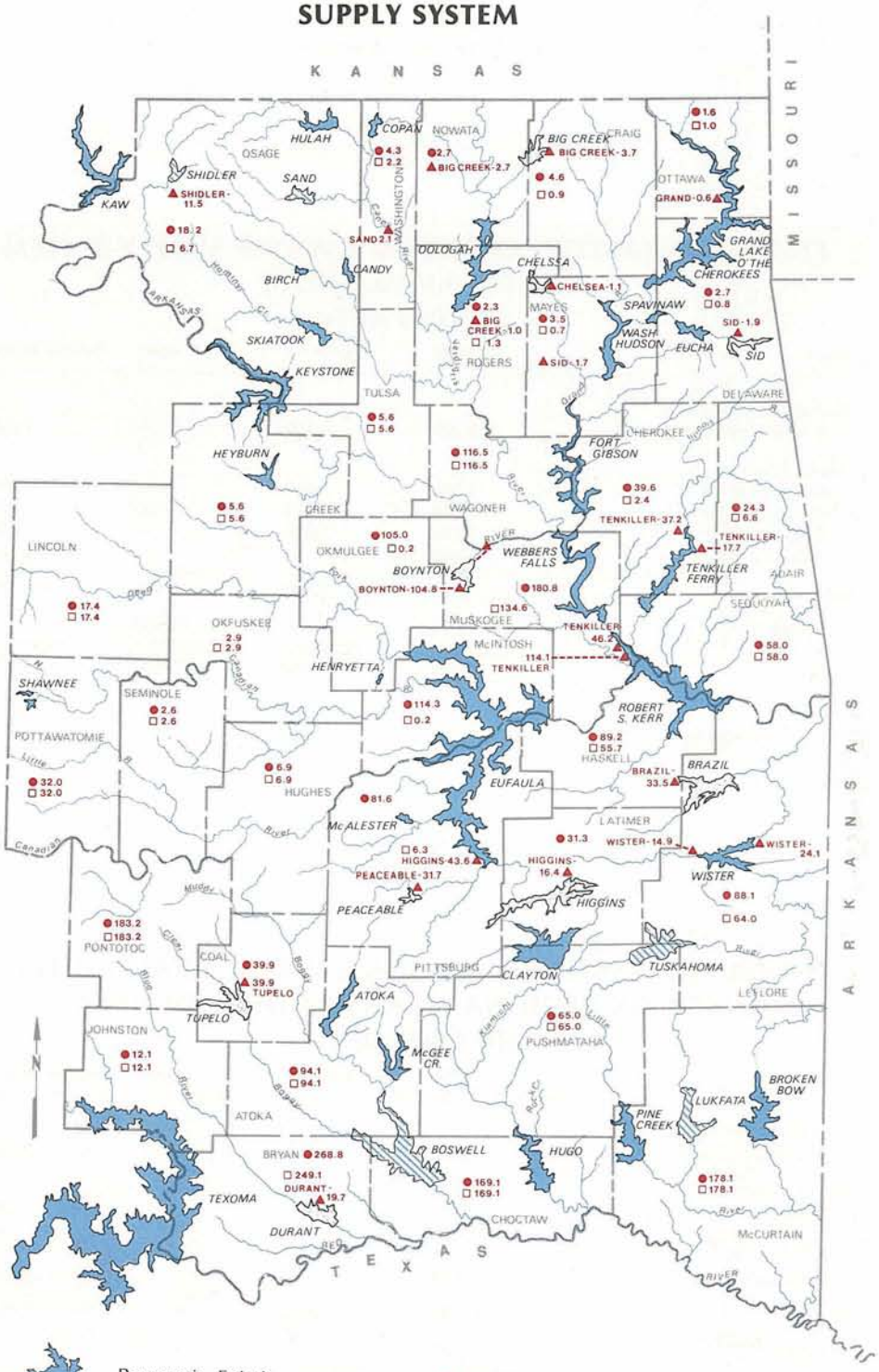
Facilities will have to be constructed to meet the area's increasing water requirements, whether those needs develop as projected by the Planning Committee, eastern Oklahoma organizations or somewhere in between. Therefore, to insure adequate water supplies to eastern Oklahoma residents and industries, the Eastern Oklahoma Water Supply Studies should remain a significant consideration in the evolution of the Oklahoma Comprehensive Water Plan.

SURPLUS WATER AVAILABILITY

Although water development plans for eastern Oklahoma remain at a conceptual level, the studies have progressed sufficiently to show that major water transfers from eastern Oklahoma to central and western areas would not interfere with those plans. As shown in Figure 124, the total yield from potential ground water and stream water development is 10.5 million acre-feet annually. Allowances of 4.3 million acre-feet annually for local use and 2.5 million acre-feet annually for export via the water conveyance system leave a potential surplus exceeding 3.7 million acre-feet per year.

Figure 125 shows the amount of surplus water available based upon the Regional Plans of Development proposed by the Planning Committee. Under these projections, the potential surplus from all sources, after allowances for local use and export, is six million acre-feet annually.

FIGURE 123 EASTERN OKLAHOMA IRRIGATION WATER SUPPLY SYSTEM



Data—Oklahoma Water Resources Board, Bureau of Reclamation and U.S. Army Corps of Engineers

Mapping—Oklahoma Water Resources Board

FIGURE 124 EASTERN OKLAHOMA WATER SUPPLY SYSTEM WATER AVAILABILITY (In 1,000 Af/Yr)

Source	Yield	Local Use	Export	Potential Surplus
Ground Water & SCS & Municipal Lakes	3,200	1,780	—	1,420
Major Lakes				
Existing (18)	2,000	1,410	400	190
Authorized (5)	1,050	70	900	80
Proposed (19)	1,190	1,020	—	170
Potential (15)	1,860	—	—	1,860
Subtotal	6,100	2,500	1,300	2,300
Scalping	1,200	—	1,200	—
TOTAL	10,500	4,280	2,500	3,720

FIGURE 125 EASTERN OKLAHOMA WATER AVAILABILITY BASED ON REGIONAL PLANS OF DEVELOPMENT (In 1,000 Af/Yr)

Source	Yield	Local Use	Export	Potential Surplus
Ground Water & SCS & Municipal Lakes	3,200	650	—	2,550
Major Lakes				
Existing (18)	2,000	930	400	670
Authorized (5)	1,050	20	900	130
Proposed (9)	640	400	—	240
Potential (25)	2,410	—	—	2,410
Subtotal	6,100	1,350	1,300	3,450
Scalping	1,200	—	1,200	—
TOTAL	10,500	2,000	2,500	6,000