

# **C. H. GUERNSEY & COMPANY**

Engineers • Architects • Consultants

# **WATER SUPPLY REGIONALIZATION**



## **2011 GOVERNOR'S WATER CONFERENCE**

**October 18, 2011  
Norman, OK**

• Consultants



# Overview

- **Review**
  - Water Planning in Oklahoma
  - Reservoir Viability
  - Water Conveyance
- **Regional Systems**
  - Potential
  - Under Consideration

# Water Planning in Oklahoma

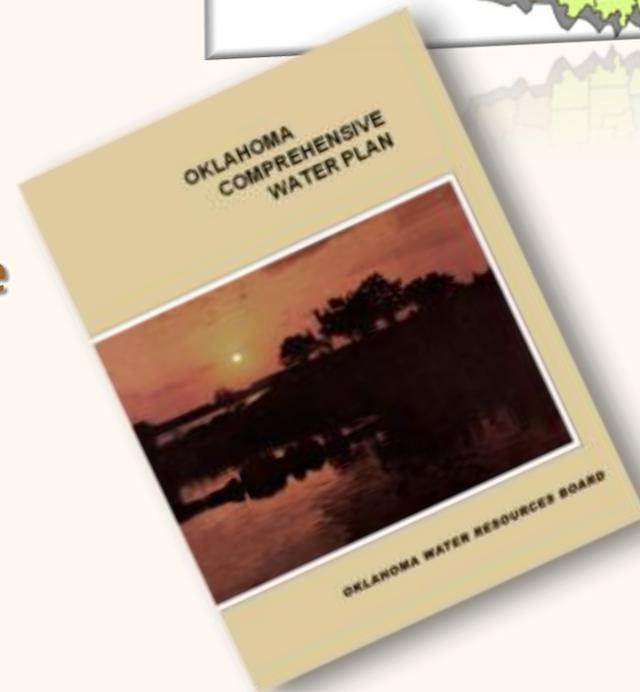
**1957 OWRB Created**

**1966 Potential Reservoirs Identified**

**1973 Extensive BOR Lake Studies**

**1980 Comprehensive Water Plan**

**1995 Comprehensive Plan Update**



# Water Planning in Oklahoma

**OWRB Embarked on 2011 Comprehensive Water Plan in 2007**



# Reservoir Viability

Literature Search (USACE, BOR, OWRB, NRCS)

Database Population (EIs)

Weighted Matrix

Environmental-Screen

Mapping

Map Reconnaissance

Cost Estimate

Gap Analysis

Evaluation Workshop

**Reservoir Feasibility Analysis**  
Criteria Weighting Process

	B	C	D	E	F	G	H	I	J	K	L		Weighted Value		
A	3 A	1 A	3 A	1 A	2 A	2 A	A	A	2 A	2 A	A	A	16	Unit costs - \$ per acre ft of storage	10.0
B	1 C	D	1 E	F	G	2 H	2 I	J	K	L			3	Mitigatable environmental/cultural issues	1.9
C	2 C	2 D	3 E	1 F	3 G	2 H	1 I	2 J	1 K	L			13	Proximity to demand or conveyance	8.1
D	2 C	C	2 C	2 C	C	1 C	2 C	1 C	C	C			4	Quality of life impact	2.5
E	3 E	2 E	1 E	1 E	1 E	1 E	1 E	1 E	1 E	E			16	Sponsor(s) availability	10.0
F	2 G	2 H	2 I	2 J	1 K	L							3	Water quality	1.9
G													8	Beneficial use	5.0
H													14	Political support	8.8
I													11	Compatibility with 2011 Plan	6.9
J													13	Level of net benefit	8.1
K													14	Ease of implementation	8.8
L													0		
													Max. Value	16	

How Important  
4 Major Preference

**Reservoir Data Report**

Reservoir Name: Albany Lake

Agency: U.S. Army Corps of Engineers, Tulsa District

Location: Bryan County 18 miles southeast of Durant, OK and 1.5 miles southeast of Albany, OK

Primary Study Document(s): Comprehensive Basin Study, Red River below Denham Dam, Arkansas, Louisiana, Oklahoma and Texas, Invasive Species Report, Albany Lake, Island Bayou, Oklahoma

Primary Study Date: 04/19/78

Region: Blue Buggy

Basin: 13-Red River Mainstem (To Washita)

Stem(s): Island Bayou @ near mile 8.5

Beneficial Uses: FC, WS, R, F&W

DrainArea (Sq MI): 334

Lat/Long or Section: Section 8 & 17, T 8 S R 11 E

Dam Type: rolled earth embankment with 28' crest width

Cons. Sto. Surface Area (AC): 4,960 Dependable Yield (AD): 10,847

Dam Crest Elevation: 549.00 Max Surface Area (AC): 11,670

Dam Length (FT): 10,500 Dam Height (FT): 79

Embankment Volume (CY): 2,460,000 Flood Pool Elevation: 528.5

Valley Wall Length (FT): 5,176 Top of Sed. Pool Elev:

Max Water Surface Elev: 544.9 Top of Dead Pool Elev: 489

Recreation Boundary (AC): 22,200 Top of Cons. Pool Elev: 517

Spillway: 400' wide limited spillway and a 6.5' diameter gated conduit

Spillway Elevation(s): 533 Power Pool Elevation:

Total Storage (AF): 347,100 Surgeage (AF):

Conservation Pool Storage (AF): 10,200 Flood Control Storage (AF): 55,100

Sediment Storage (AF): 6,800 Dead Storage (AF):

Geology:

Water Quality: High turbidity and Phosphates and Mercury noted in testing. Report on Southeast Oklahoma Water Supply Study, BOR, September 1987 indicates suitable water with standard treatment.

Previous Cost Estimate: \$27,100,000 Year of Cost Estimate: 01/1978

Grouping: 4

Issues: Also: Comprehensive Technical Report of Southeast Oklahoma Water Supply Study, Bureau of Reclamation September 1986. Above referenced report shows power as a beneficial use and approximately twice the capacity.

Flood Flood(s) Present?

Qualifying Statements: Not near a population center  
Low cost per unit storage

Monday, August 16, 2010 Page 1 of 127

# Reservoir Viability

**Category 4 – Apparently Feasible - 38 Sites**

**Category 3 – Possibly Feasible - 30 Sites**

**Category 2 – Sites with Fatal Flaws - 14 Sites**

**Category 1 – Insufficient Information - 29 Sites**

**Category 0 – No Information Available - 14 Sites**

# Reservoir Viability



# Water Conveyance



Engineers

Architects

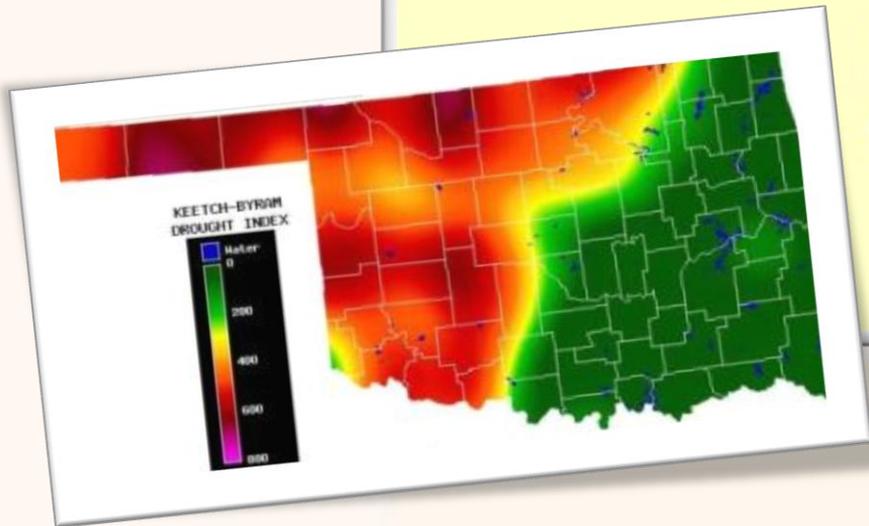
Consultants

# Water Conveyance

16 inches



56 inches



Engineers

Architects

Consultants



# Water Conveyance

**Rainfall Distribution**

**Underutilized Existing Resources – Arable Land**

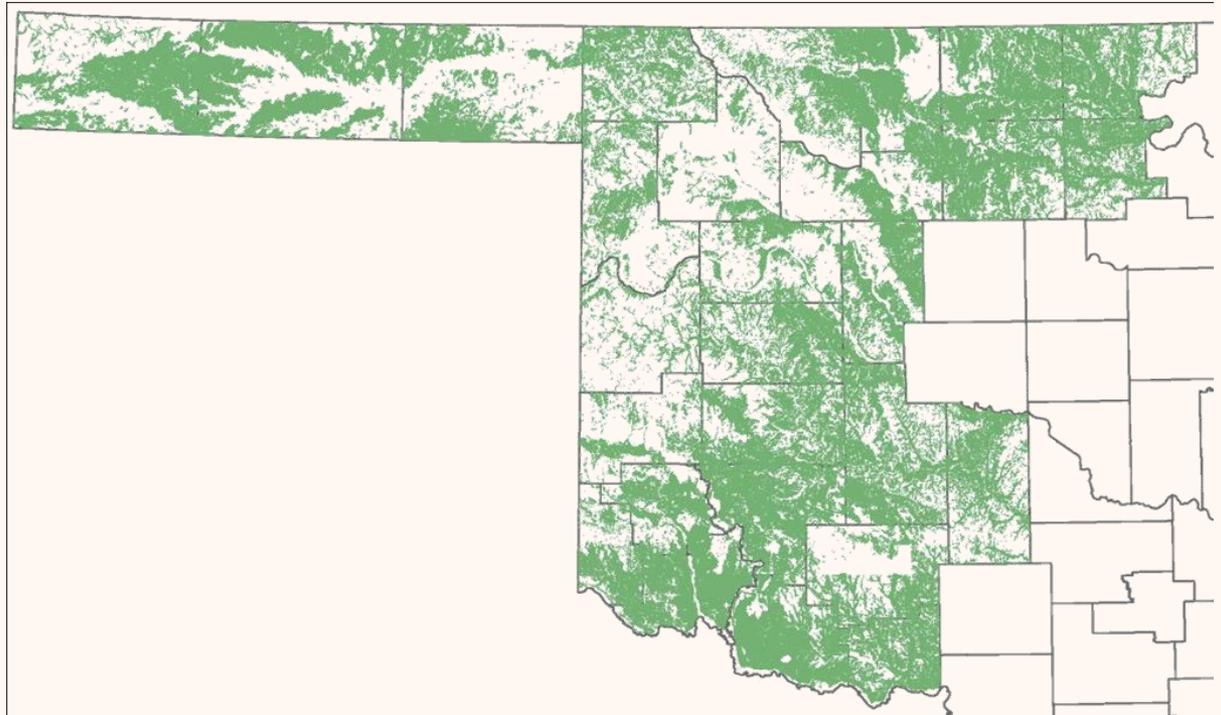
**Precedence – Atoka to Oklahoma City Pipeline**

**Increasing Demands**

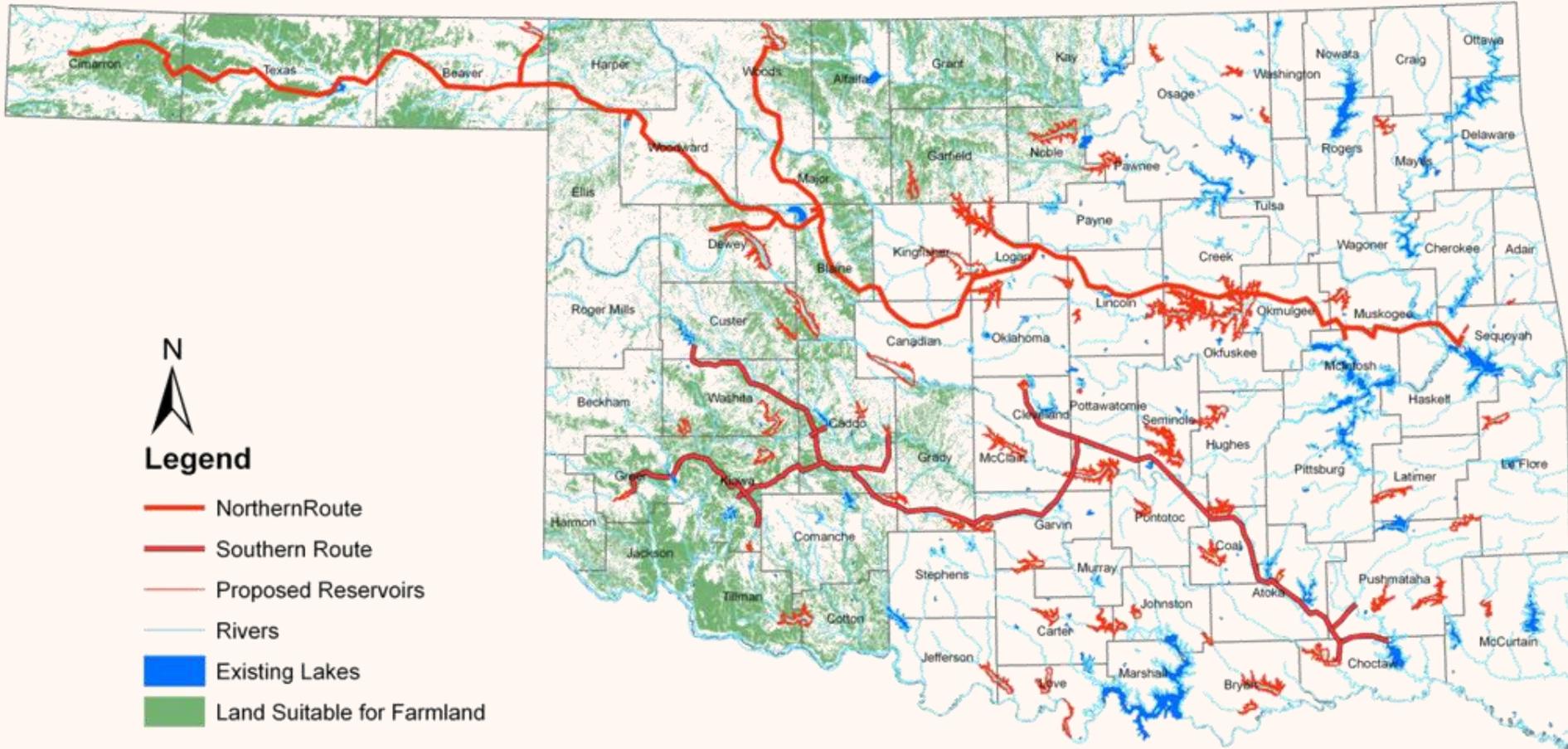
**Political Resistance**

**Legal Issues**

**Costs**



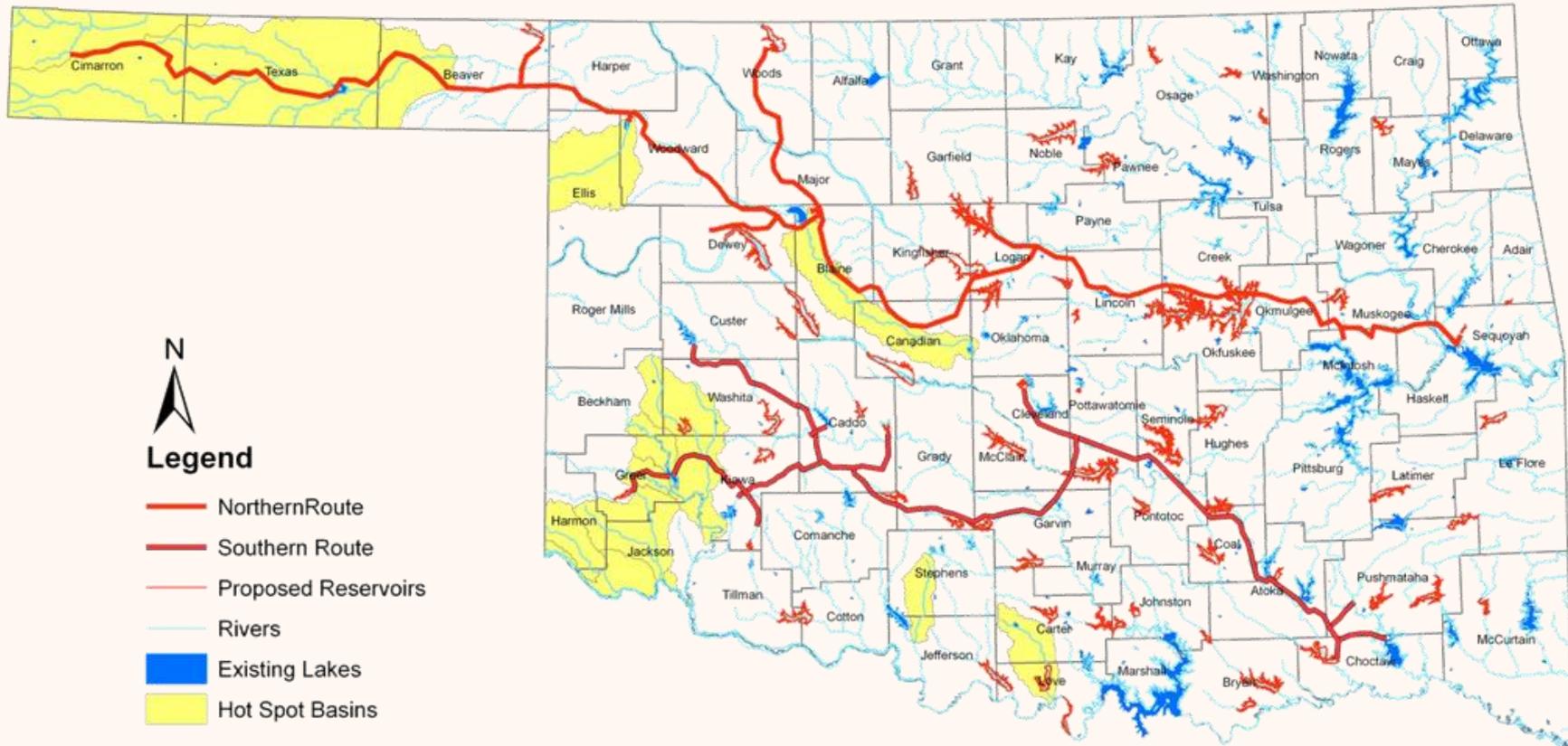
# Viability Reservoirs & Original Routes



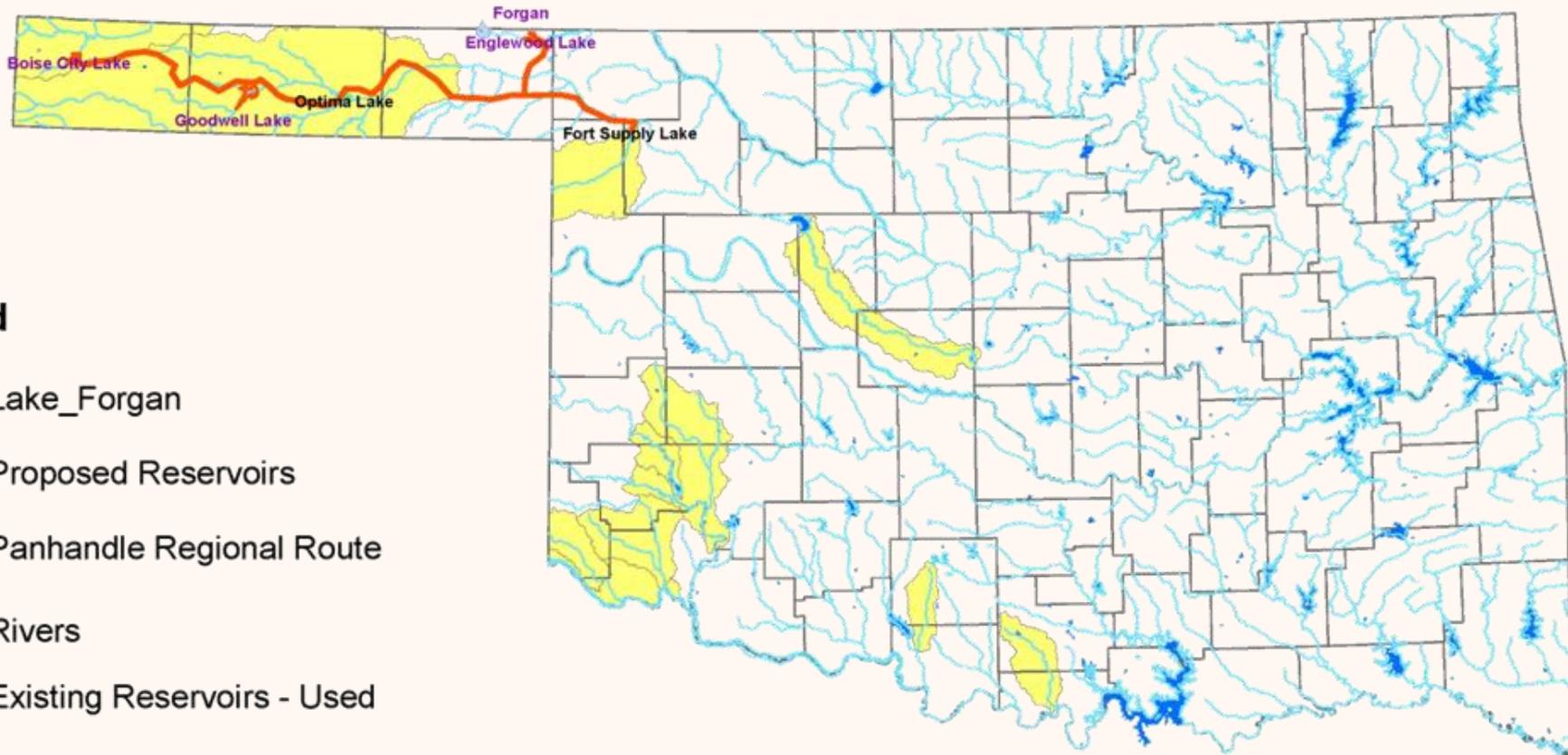
# Reservoirs & Conveyance

Refine a business approach to “right-size” alternatives to the future demands, customer objectives and fiscal practicality; address reality.

# Regional System - Potential

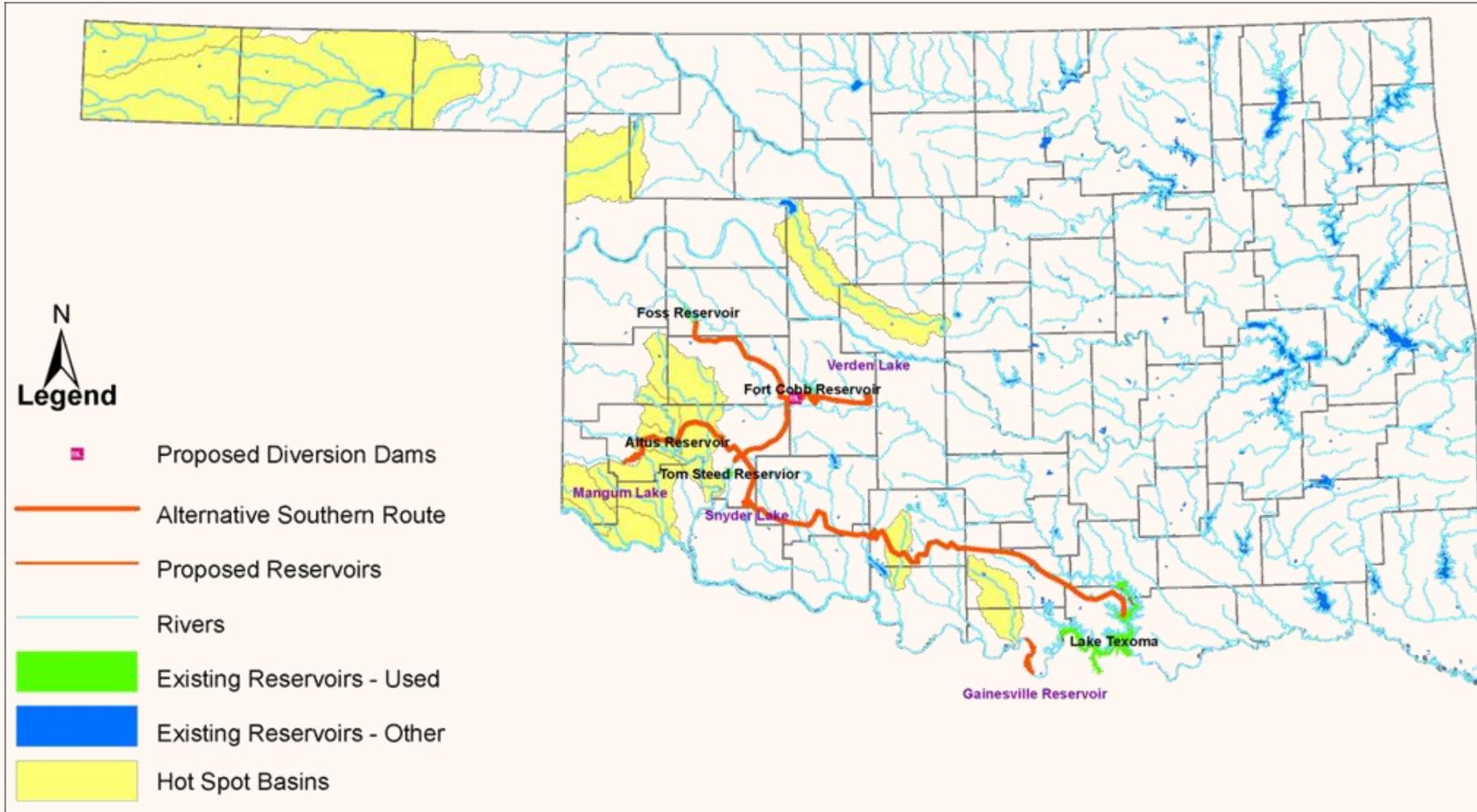


# Regional System - Potential

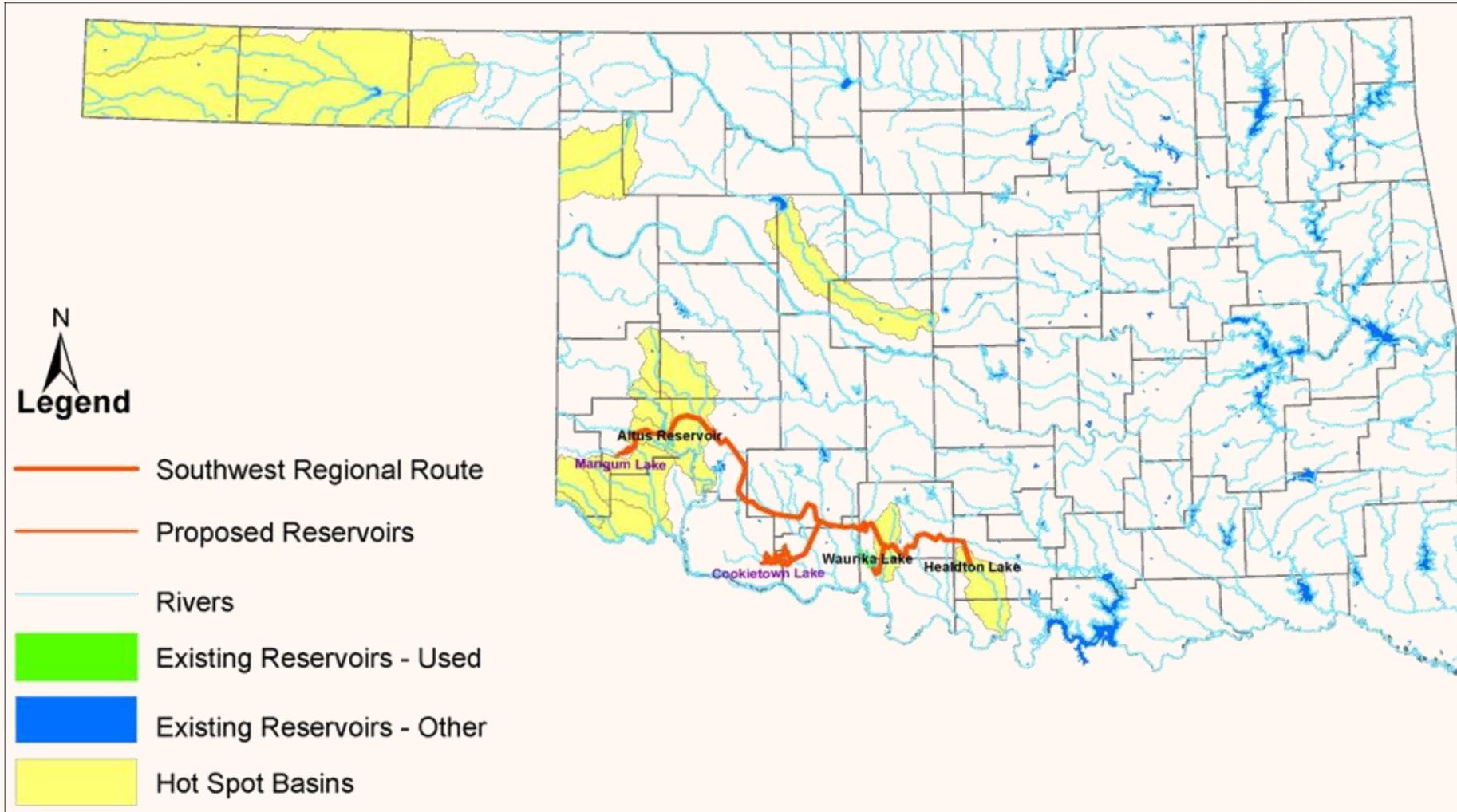


- Legend**
- Lake\_Forgan
  - Proposed Reservoirs
  - Panhandle Regional Route
  - Rivers
  - Existing Reservoirs - Used
  - Existing Reservoirs - Other
  - Hot Spot Basins

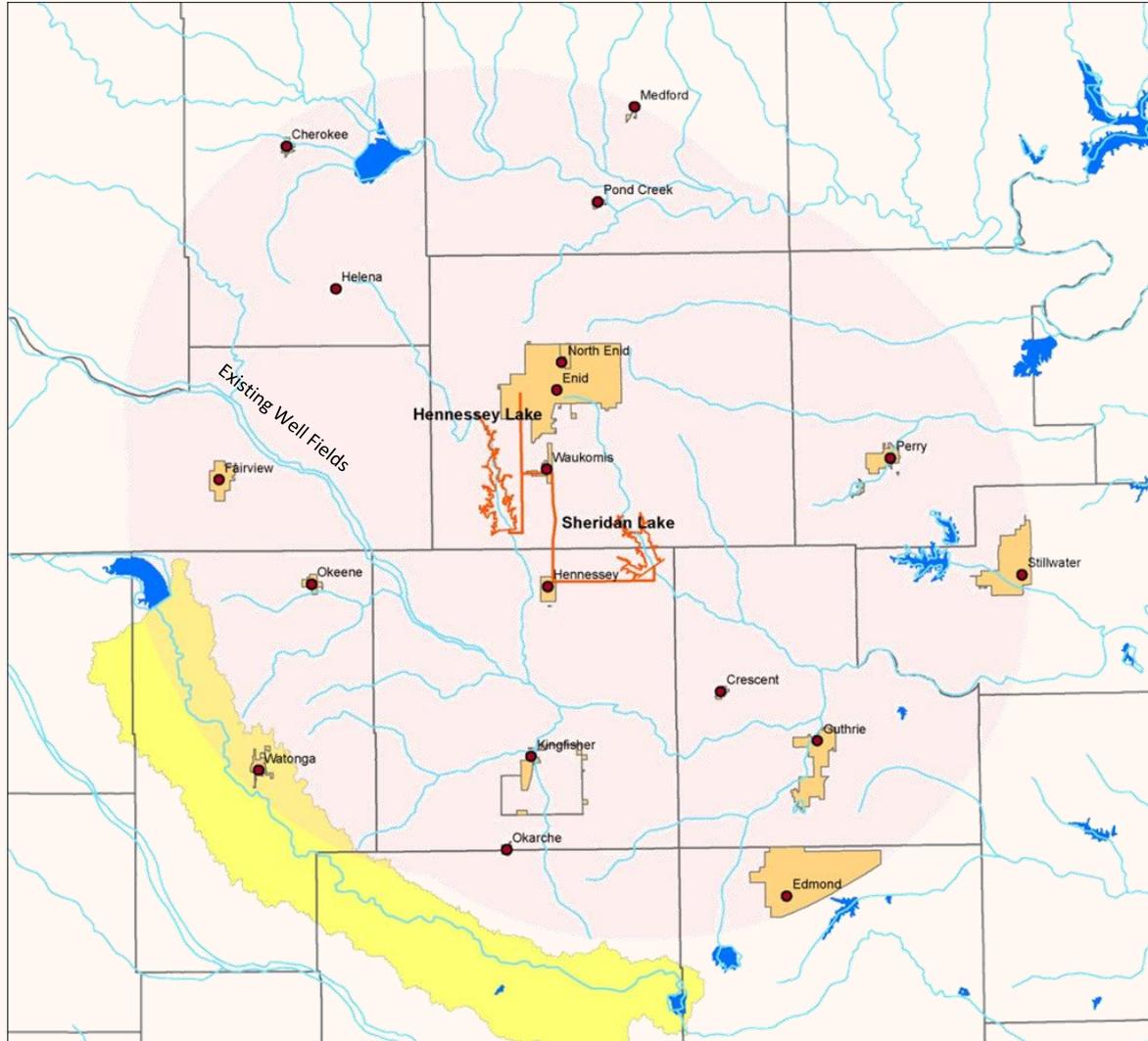
# Regional System - Potential



# Regional System - Potential



# Regional System - Enid



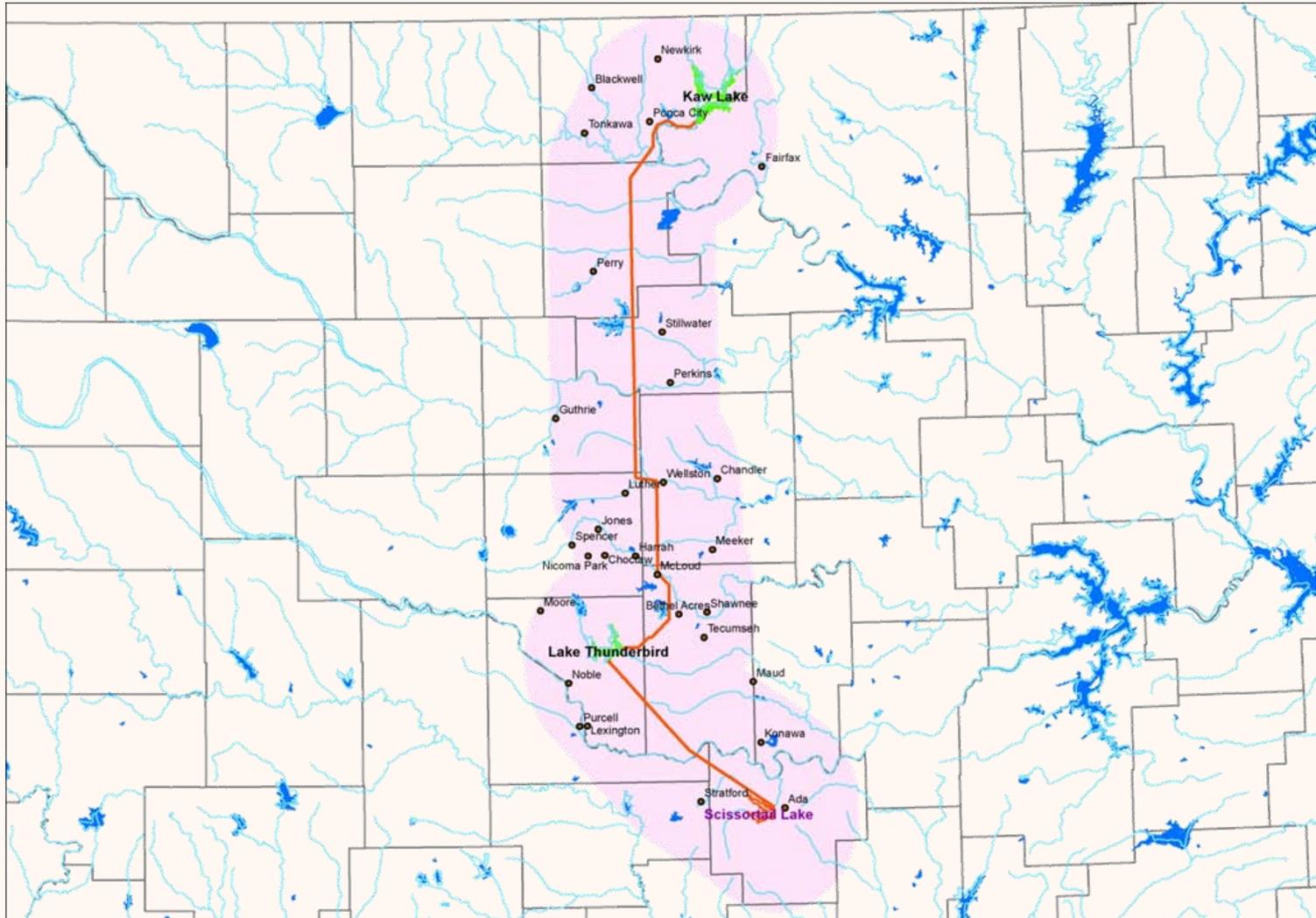
Engineers

Architects

Consultants



# Regional System - COMCD



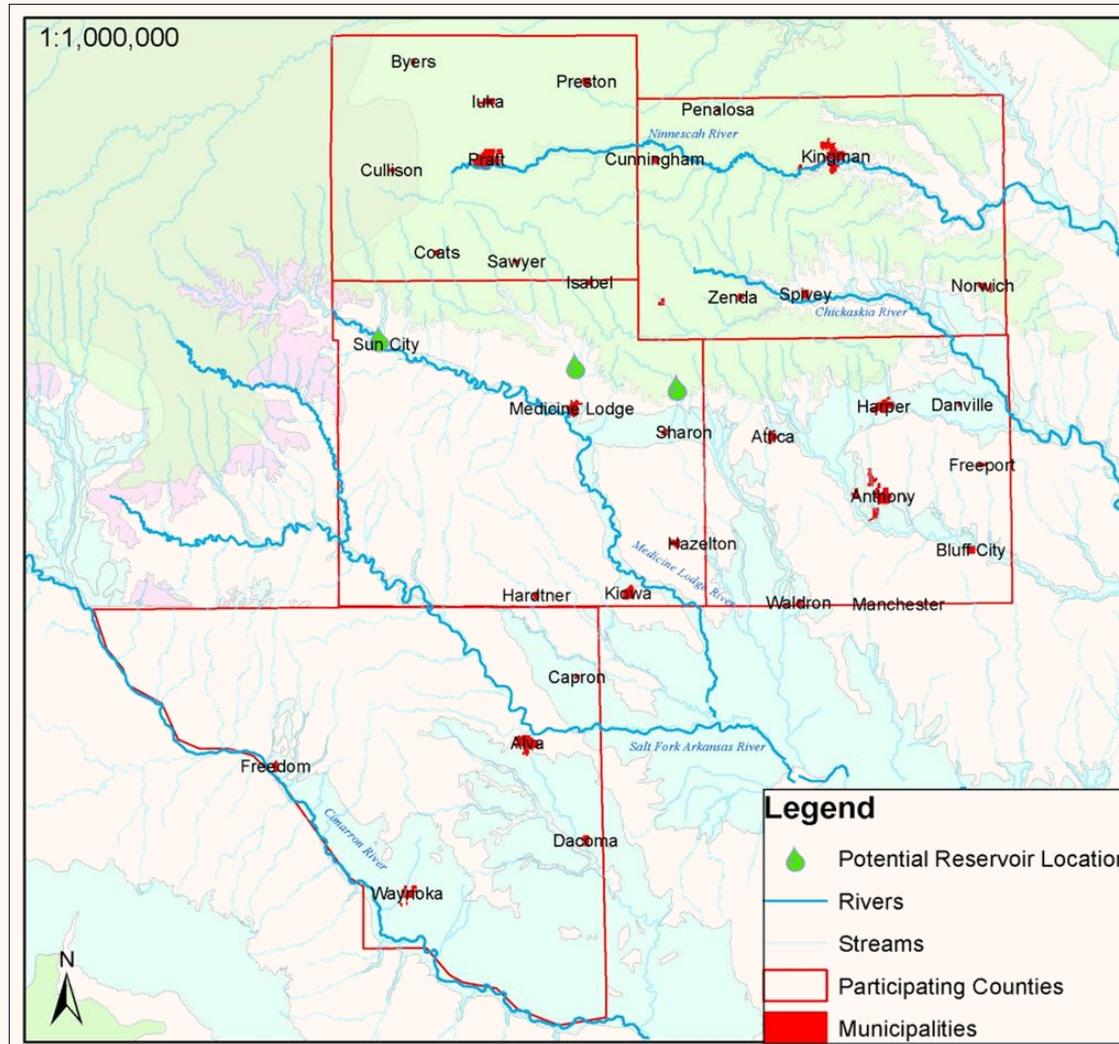
Engineers

Architects

Consultants



# Regional System - Sunflower



**Karl Stickley, PE**  
**C.H. Guernsey & Company**  
**405.416.8217**  
**karl.stickley@chguernsey.com**

**Ken Senour, CEP, QEP**  
**C.H. Guernsey & Company**  
**405.416.8140**  
**ken.senour@chguernsey.com**

