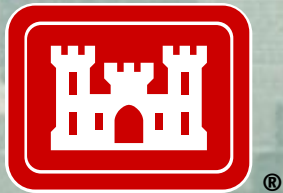


# Arkansas Hydropower Briefing

## Arkansas Alternative Energy Commission

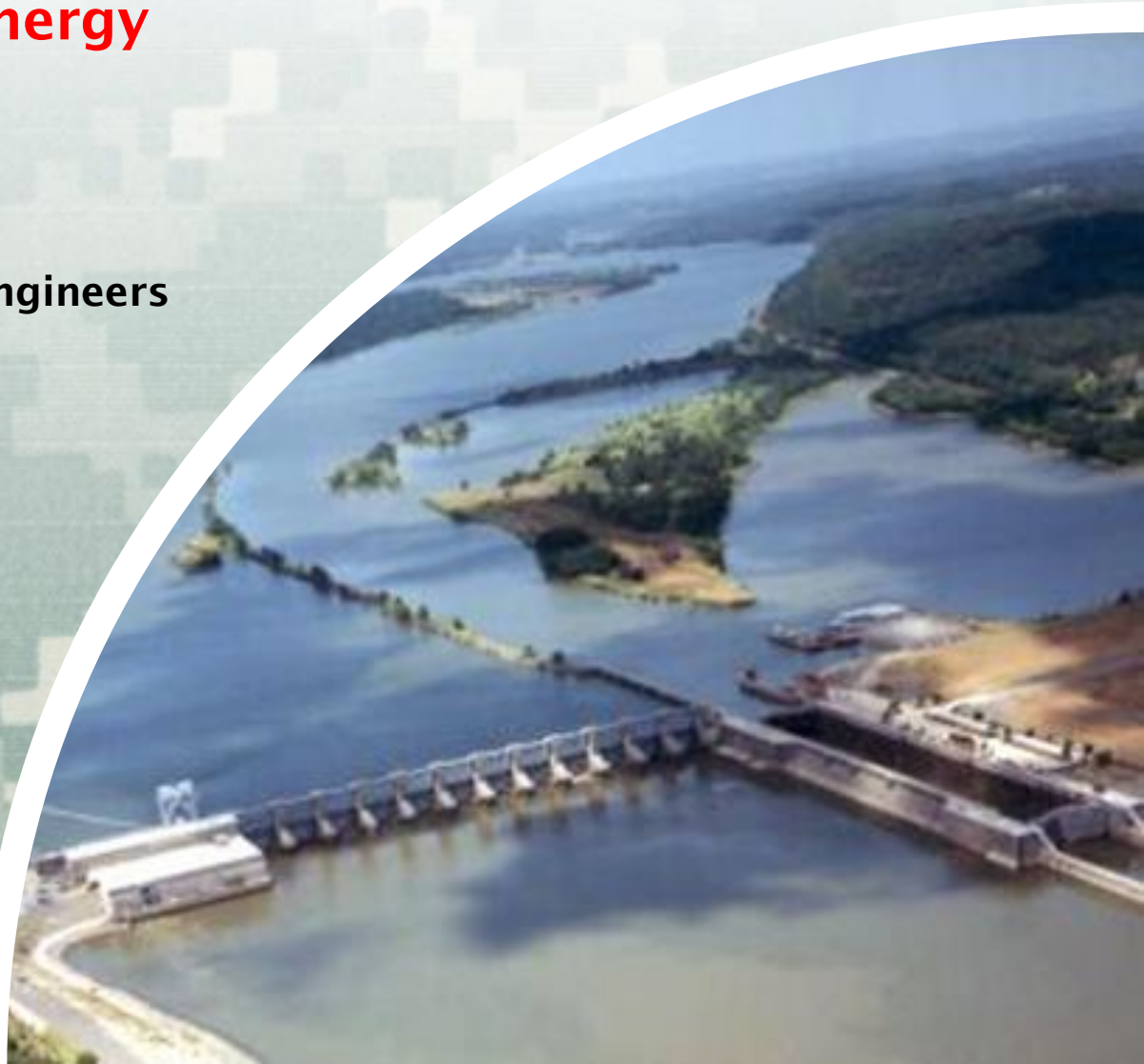
Lee Beverly - Project Manager  
Little Rock District, Corps of Engineers

May 23, 2013

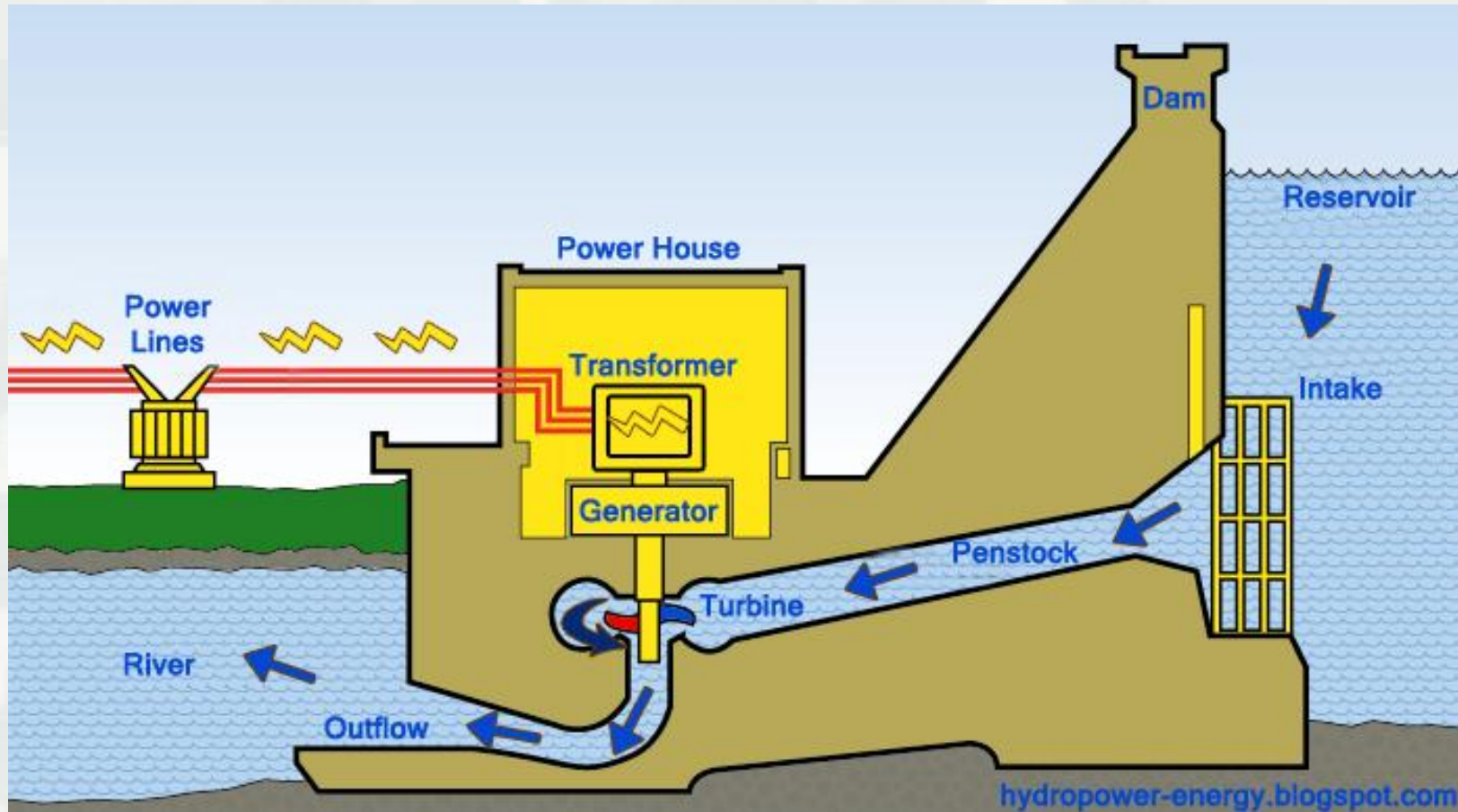


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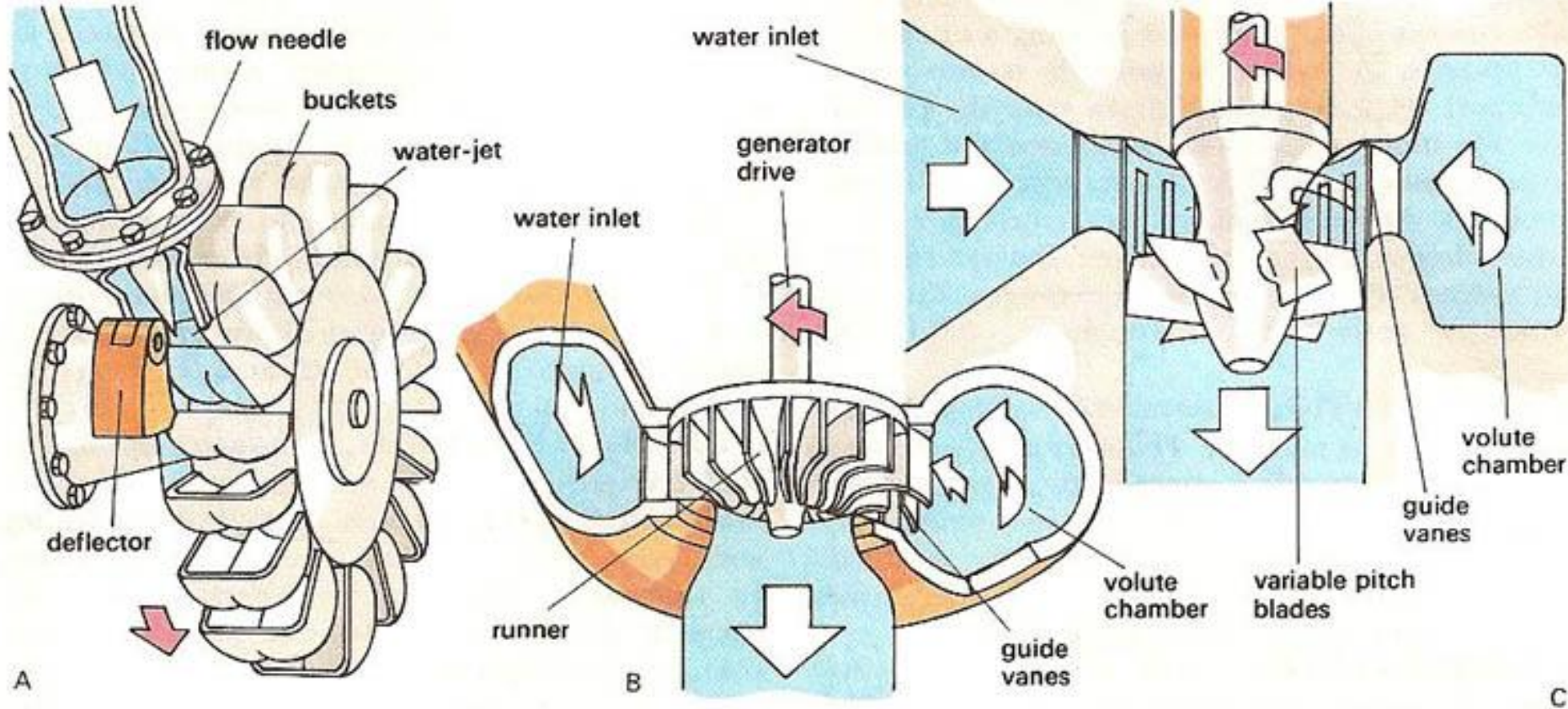
US Army Corps of Engineers  
**BUILDING STRONG**®



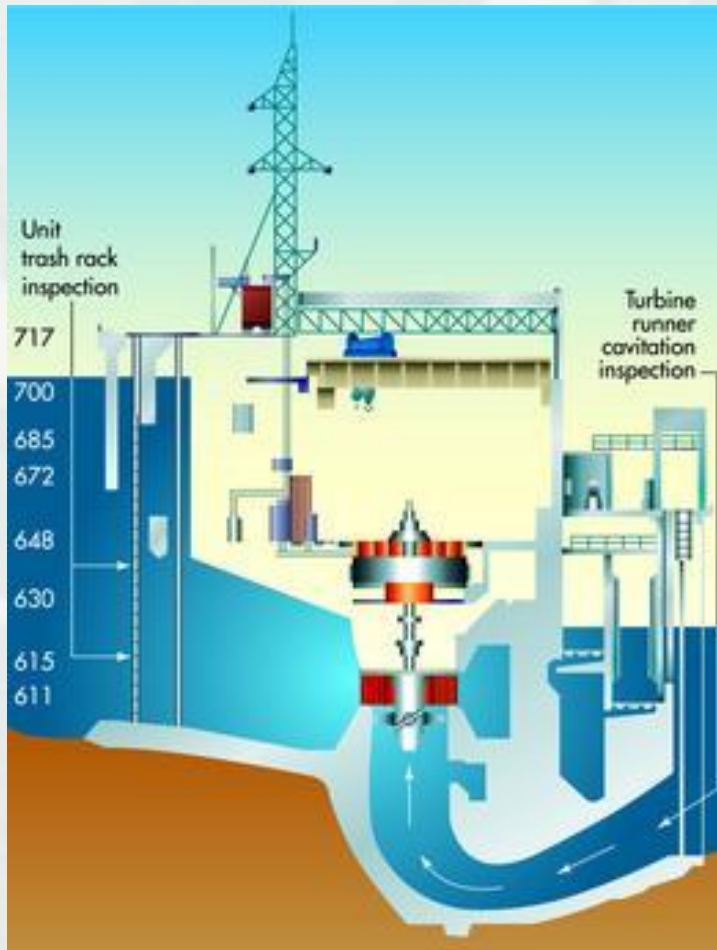
# Typical Hydropower Installation



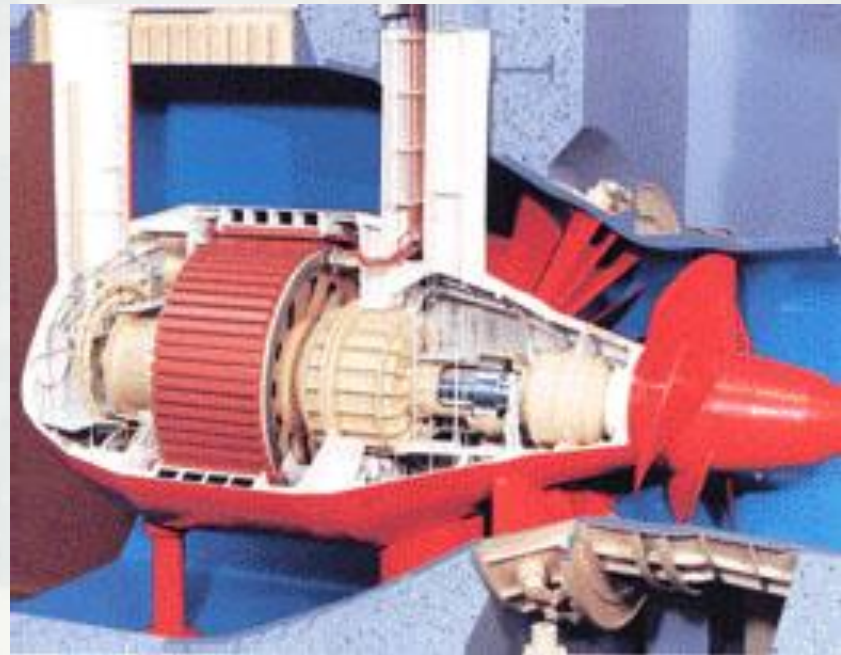
# Pelton, Francis and Kaplan Turbine Designs



# Low-Head Turbine Designs



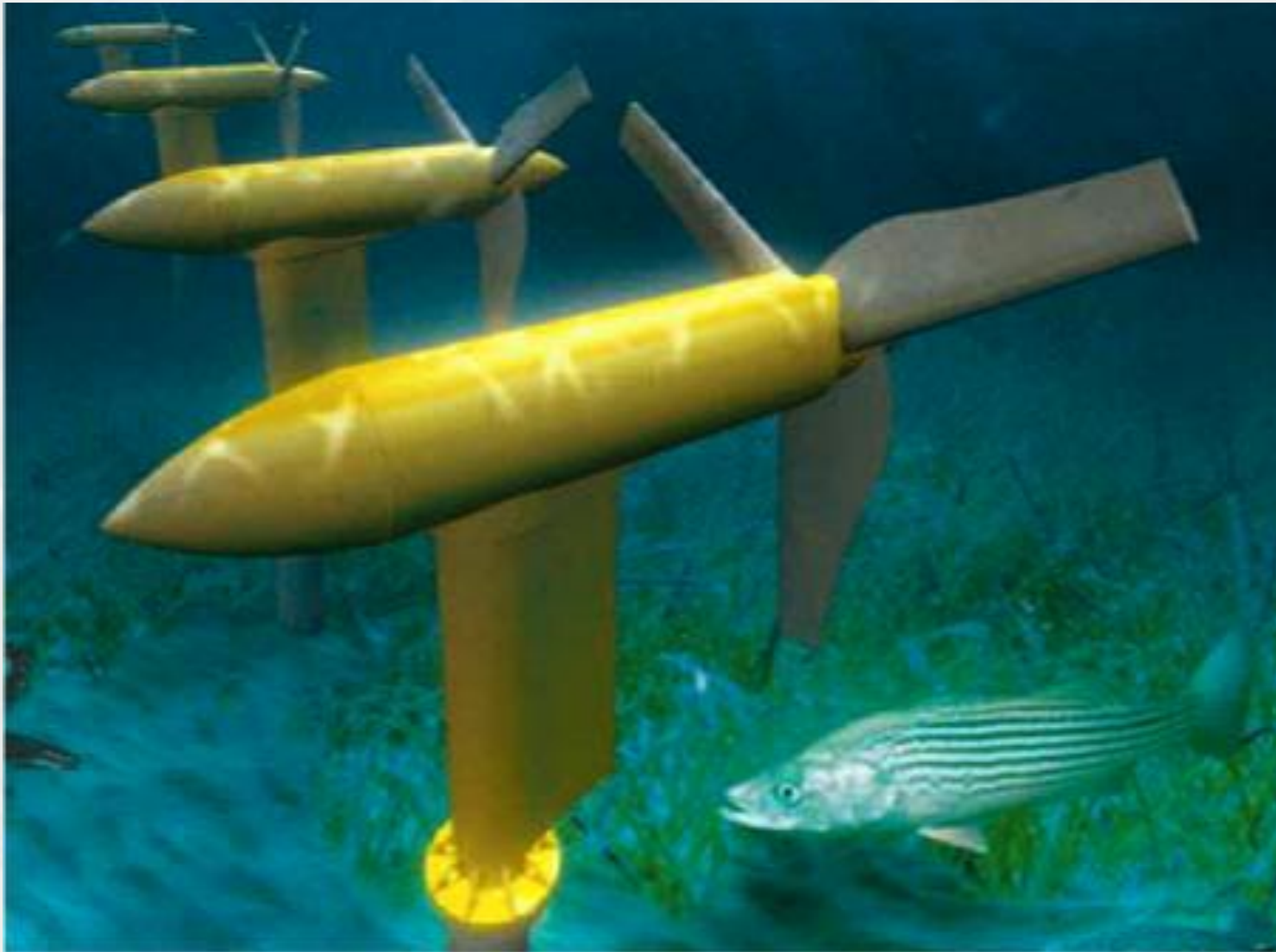
**Vertical Shaft  
Kaplan Turbine**



**Horizontal Shaft Kaplan  
Turbine**



# Hydrokinetic Units



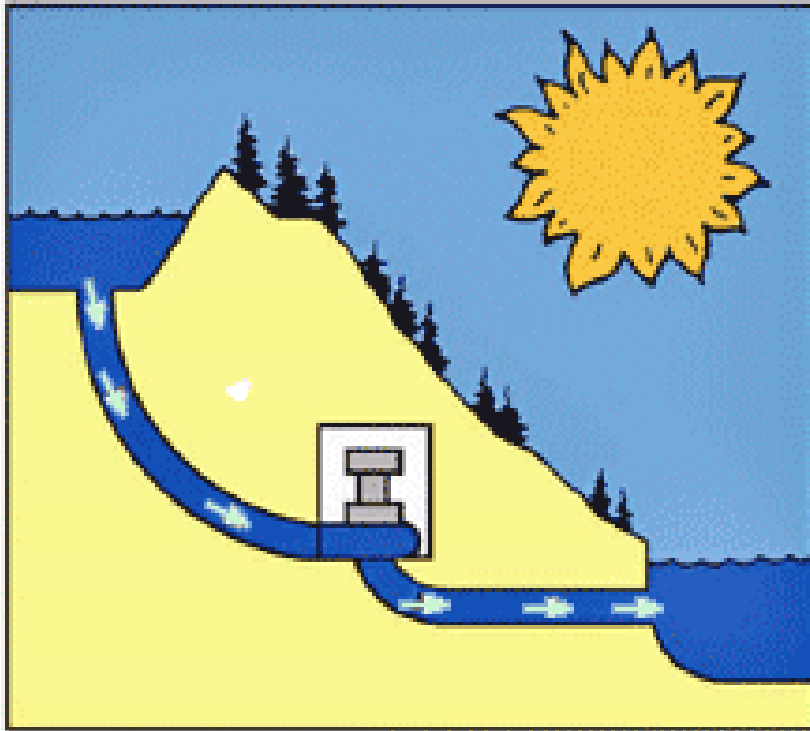
**BUILDING STRONG®**

# Hydro Output Defined

- Energy Produced-
  - Peaking Capacity
  - Base Energy
- Type of Operation-
  - Stored Water
  - Run-of-River



# Hydropower Pump-Back Storage



Daytime: Water flows downhill through turbines, producing electricity



Nighttime: Water pumped uphill to reservoir for tomorrow's use



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<b>Plant</b>	<b>County</b>	<b>River</b>	<b>Year completed</b>	<b>Agency</b>	<b>Capacity</b>	<b>Units</b>
<b>Bull Shoals</b>	<b>Marion/Baxter</b>	<b>White</b>	<b>1952</b>	<b>USACE</b>	<b>380</b>	<b>8</b>
<b>Dardanelle</b>	<b>Pope/Yell</b>	<b>Arkansas</b>	<b>1965</b>	<b>USACE</b>	<b>160.8</b>	<b>4</b>
<b>Beaver</b>	<b>Carroll</b>	<b>White</b>	<b>1965</b>	<b>USACE</b>	<b>112</b>	<b>2</b>
<b>Dam 2</b>	<b>Desha</b>	<b>Arkansas</b>	<b>1999</b>	<b>AECC</b>	<b>102.6</b>	<b>3</b>
<b>Ozark</b>	<b>Franklin</b>	<b>Arkansas</b>	<b>1973</b>	<b>USACE</b>	<b>100</b>	<b>5</b>
<b>Greers Ferry</b>	<b>Cleburne</b>	<b>Little Red</b>	<b>1964</b>	<b>USACE</b>	<b>96</b>	<b>2</b>
<b>Norfork</b>	<b>Baxter</b>	<b>North Fork, White</b>	<b>1944</b>	<b>USACE</b>	<b>80.5</b>	<b>2</b>
<b>Blakely Mountain</b>	<b>Garland</b>	<b>Ouachita</b>	<b>1955</b>	<b>USACE</b>	<b>75</b>	<b>2</b>
<b>DeGray</b>	<b>Clark</b>	<b>Caddo</b>	<b>1972</b>	<b>USACE</b>	<b>68</b>	<b>2</b>
<b>Carpenter Dam</b>	<b>Garland</b>	<b>Ouachita</b>	<b>1930</b>	<b>Entergy</b>	<b>56</b>	<b>2</b>
<b>Murray</b>	<b>Pulaski</b>	<b>Arkansas</b>	<b>1988</b>	<b>NLRE</b>	<b>45.4</b>	<b>2</b>
<b>Ellis</b>	<b>Crawford/Sebastian</b>	<b>Arkansas</b>	<b>1988</b>	<b>AECC</b>	<b>32.4</b>	<b>3</b>
<b>Whillock</b>	<b>Conway</b>	<b>Arkansas</b>	<b>1993</b>	<b>AECC</b>	<b>32.4</b>	<b>3</b>
<b>Narrows</b>	<b>Pike</b>	<b>Little Missouri</b>	<b>1950</b>	<b>USACE</b>	<b>25.5</b>	<b>3</b>
<b>Rommel Dam</b>	<b>Hot Spring</b>	<b>Ouachita</b>	<b>1924</b>	<b>Entergy</b>	<b>9.3</b>	<b>3</b>
<b>Marcella</b>	<b>Stone</b>	<b>White</b>	<b>2006</b>	<b>Ind County</b>	<b>4.3</b>	<b>1</b>
<b>Batesville</b>	<b>Independence</b>	<b>White</b>	<b>2007</b>	<b>Batesville</b>	<b>4.3</b>	<b>1</b>
<b>Earnhardt</b>	<b>Independence</b>	<b>White</b>	<b>2007</b>	<b>Ind County</b>	<b>3.9</b>	<b>1</b>
<b>Lee Creek</b>	<b>Crawford</b>	<b>Lee Creek</b>	<b>1992</b>	<b>Ft. Smith</b>	<b>1.5</b>	<b>1</b>

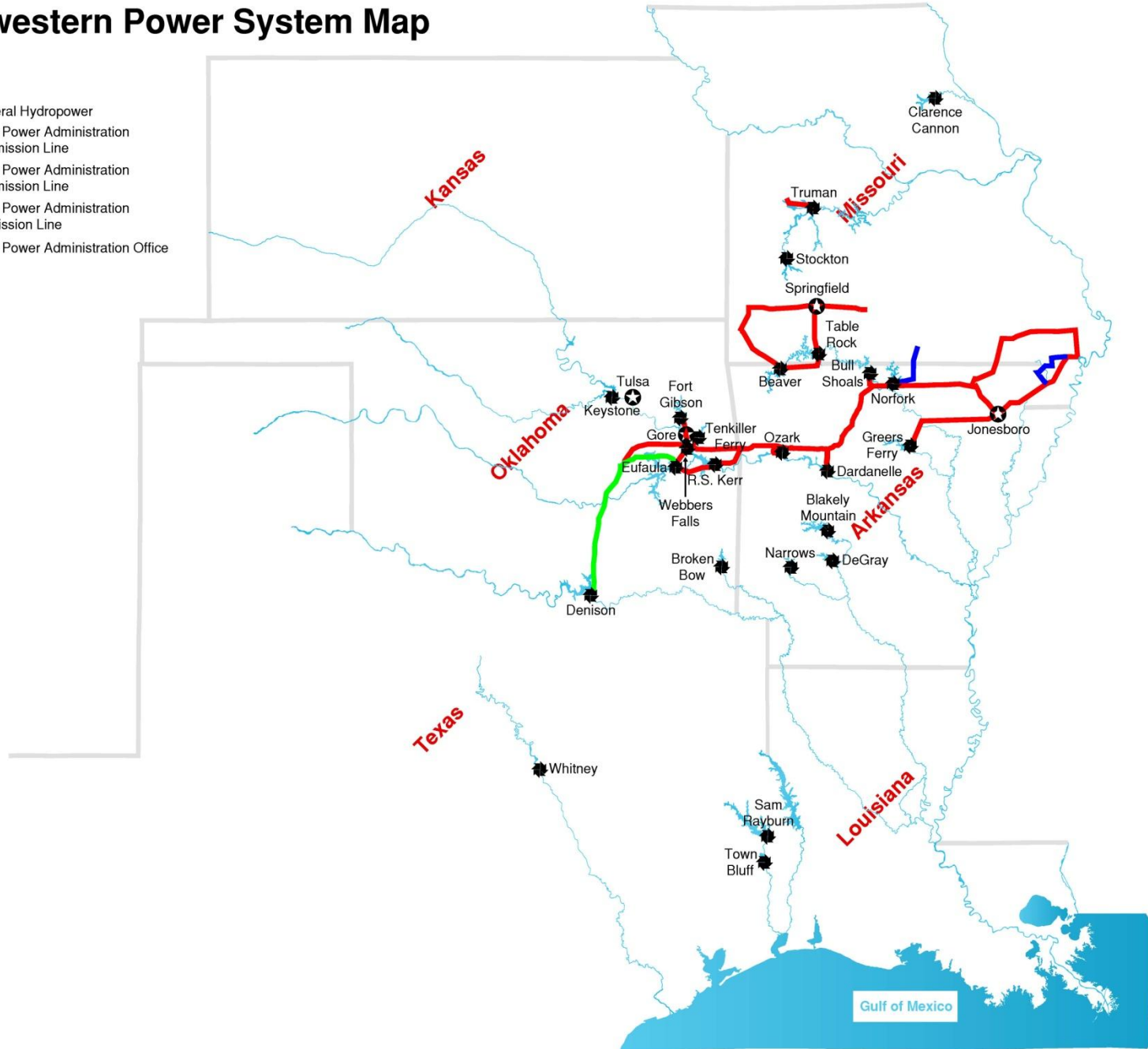




# Southwestern Power System Map

## Legend

- ★ Site with Federal Hydropower
- 161KV Transmission Line
- 138KV Transmission Line
- 69KV Transmission Line
- ★ Southwestern Power Administration Office

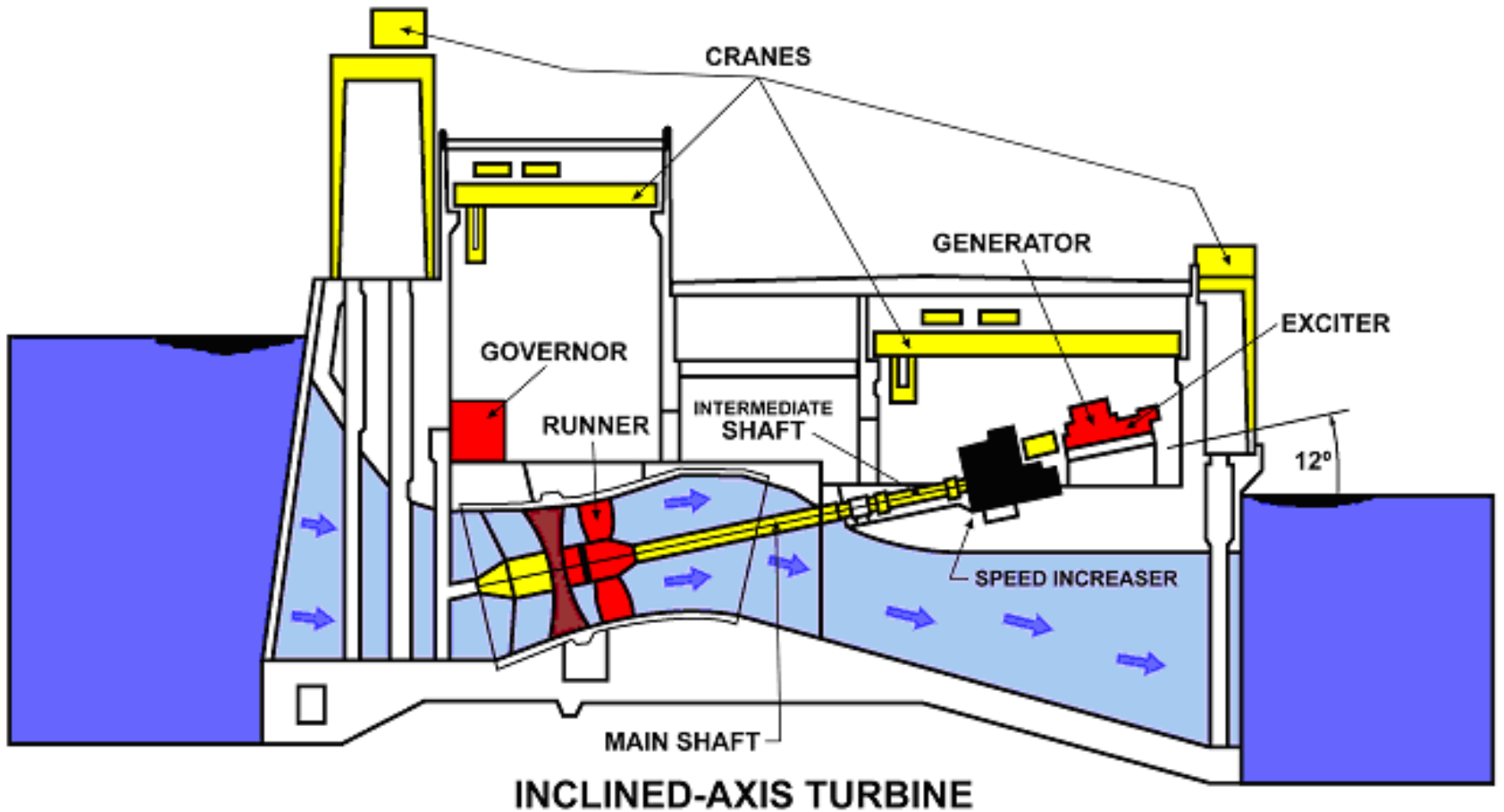


# COE/SWPA ARKANSAS CUSTOMERS

- Bentonville
- Clarksville
- Jonesboro
- Arkansas Electric Cooperative Corp.
- Paragould
- Paris
- Piggott



# Section View of Ozark Powerhouse



# Ozark Turbine Runner Assembly



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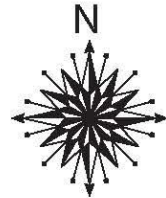
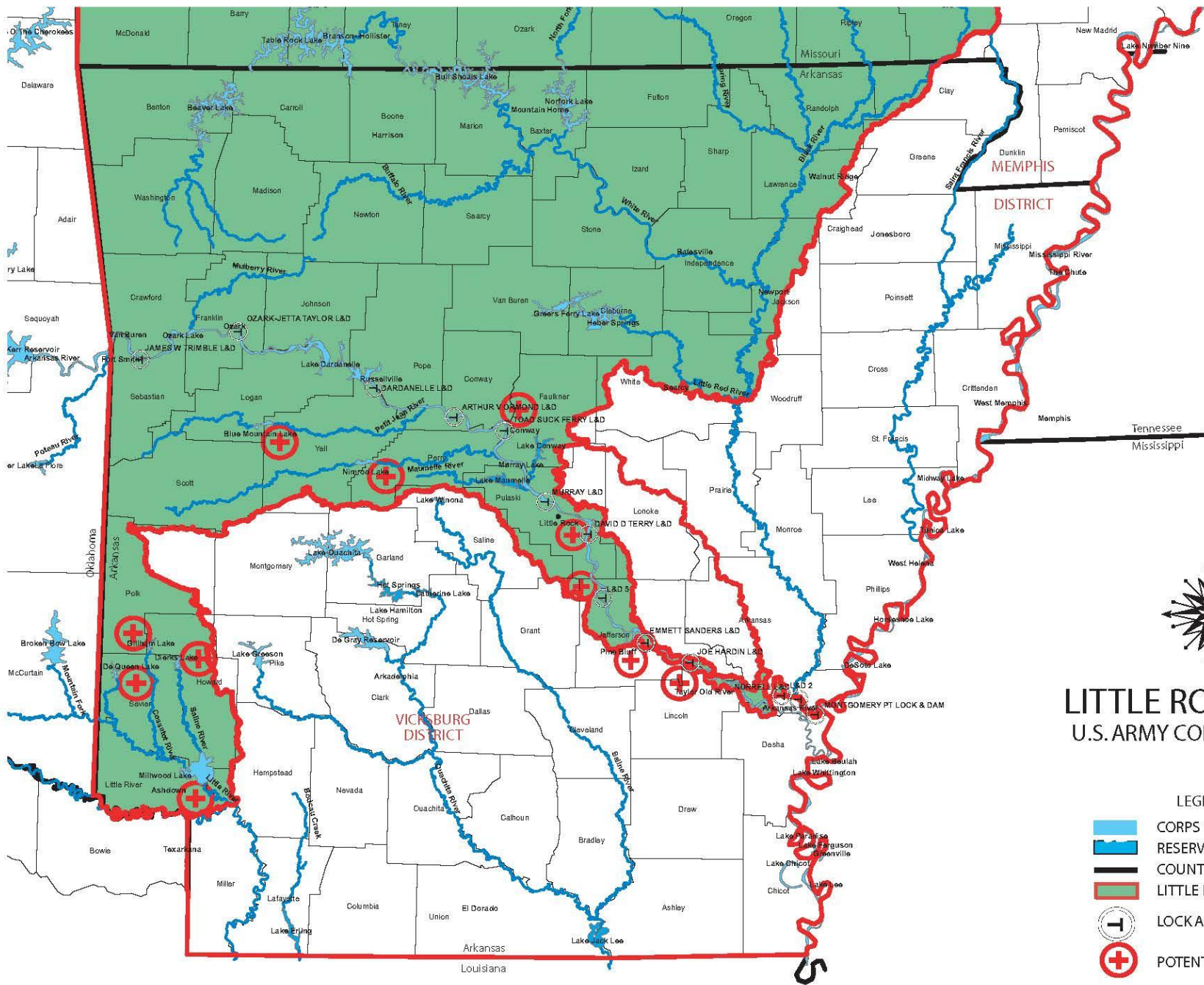
# Ozark Wicket Gate Barrel Installation



# New Hydro Opportunities

- Pump-back opportunities
- Existing Dams without plants
- FERC License Required, Except-
  - Output less than 5MW
  - Installation on an existing water conduit







# LITTLE ROCK DISTRICT

## U.S. ARMY CORPS OF ENGINEERS

### LEGEND

-  CORPS RESERVOIR
-  RESERVOIR - NON CORPS LAKES
-  COUNTY BOUNDARY
-  LITTLE ROCK DISTRICT
-  LOCK AND DAM
-  POTENTIAL COE HYDRO SITE

# Questions?



05/24/2012 14:10