

REGION C STUDY COMMISSION PHASE II

Prepared for
Region C Study Commission
by
Espey Consultants, Inc
Austin, Texas
April 26, 2010

Task 1.1

Estimate what volume of water is available from Wright Patman after giving consideration to existing water rights holders, anticipated local needs over the term of a contract period, unexpected local need and retained local surplus supply for drought protection.

Local Contact

This will be accomplished through discussions with Texarkana Water Utility, Riverbend Water Resources, International Paper, Texas Parks and Wildlife, USACE Wright Patman, other local entities.

LAKE WRIGHT PATMAN Permitted and Contracted Water Rights

- **Permitted Water Rights –**
Water Authorized for Diversion by Owner
- **Contracted Water Rights –**
Permitted Water Rights that have been sold or “Contracted” by the Owner
- **Un-Contracted Water Rights –**
Permitted Water Rights that have **NOT** been sold or “Contracted” by the Owner

LAKE WRIGHT PATMAN Un-contracted Water Rights (afpy)

<u>City of Texarkana Water Rights</u>	<u>Industrial</u>	<u>Municipal</u>	<u>Total</u>
Permitted Water Rights (afpy)	135,000	45,000	180,000
Contracted Water Rights (afpy)	120,000	2,500	122,500
Remaining for Contract (afpy)	15,000	42,500	57,500

Certificate of Adjudication 03-4836

TWDB Study Commission on Region C Water Supply, Phase I Revised Draft Report, 12-08-2009.

Task 1.2 Available Water

Estimate how much water is available from existing water rights holders for sale or contract. Which parties would be contracting the water?

LAKE WRIGHT PATMAN Potentially Available Water (afpy) From Existing Water Rights Holders

	Industrial	Municipal	Total
<u>Texarkana Permitted Water Rights</u>	<u>135,000</u>	<u>45,000</u>	<u>180,000</u>
Texarkana Un-contracted Water Rights			57,500
Contracted Water Not Used by International Paper Corporation *	77,000		77,000
Potentially Available Water	92,000	42,500	134,500

* Based on actual use during period 1994 - 2007.
Data provided by International Paper Corporation

LAKE WRIGHT PATMAN Additional Sources of Water

**Additional Yield Gained by System Operation of
Lake Wright Patman and Lake Jim Chapman is
Estimated to be 108,000 afpy.**

Freese and Nichols, Inc., 2003, System Operation
Assessment of Lake Wright Patman and Lake Jim
Chapman, Volume I Main Report.

Task 1.3

Reasonable Operating Level

(White Oak Creek Wildlife Mgmt Area – WOCWMA)

Determine what operating level of Wright Patman is reasonable due to the White Oak Creek Wildlife Management Area (WOCWMA) and determine how operations could be modified.

WOCWMA Information

- Discussions with Texas Parks and Wildlife Department, and the United States Army Corp of Engineers (January 2009).
- TPWD Letter to Dr. David Harkins, Espey Consultants, Inc., dated August 27, 2009.
- TPWD 2002 Memo from John Jones to Nathan Garner.
- "Elevation **increase to 230 ft could have minimal effects** on WOCWMA"
- "Lowest water control structure in the wetlands is 235.5"

**LAKE WRIGHT PATMAN
Reasonable Operating Levels (NGVD29)**

WOCWMA Infrastructures Affected

230 ft (NGVD29) Operating Level

- **No Infrastructures Affected**

235 ft (NGVD29) Operating Level

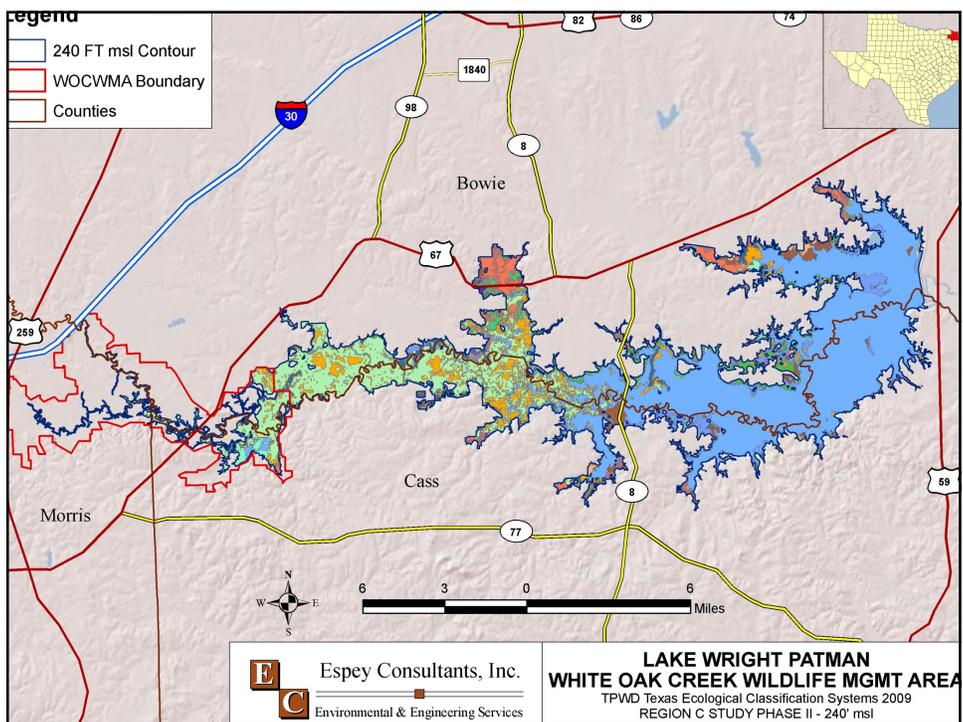
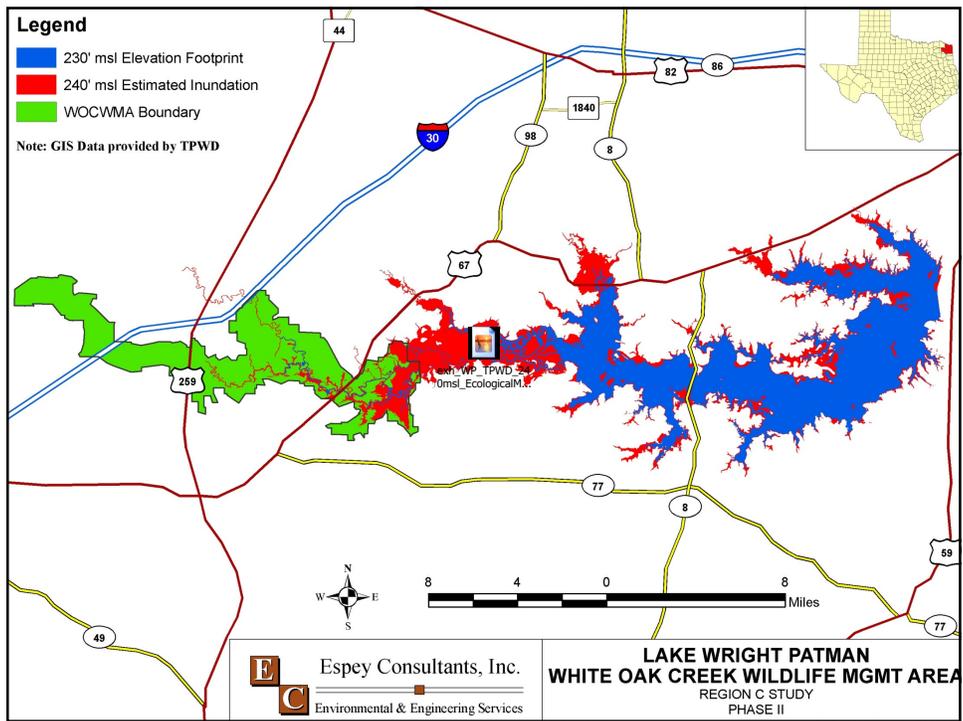
- **2 Water Control Structures**
- **3 Managed Wetland Units (480 acres)**
- **1 Concrete Bridge**

* TPWD Letter to Dr. Harkins, Espey Consultants, Inc., dated March 22,2010

**LAKE WRIGHT PATMAN
Reasonable Operating Levels (NGVD29) (Continued)**

240 ft (NGVD29) Operating Level

- **10 Water Control Structures**
- **1 High Water Bridge**
- **7.3 Miles of Levees**
- **3,596 acres of Public Hunting Land**
- **1.5 Miles of Boundary Lines**
- **11.5 Miles of ATV**
- **10 Miles of Equestrian Trails**



Legend

Wright Patman 240' msl TPWD Ecological Classification 2009

Common_nam			
Barren		Pineywoods: Longleaf or Loblolly Pine / Hardwood Flatwoods or Plantation	
Native Invasive: Deciduous Shrubland		Pineywoods: Longleaf or Loblolly Pine Flatwoods or Plantation	
Native Invasive: Deciduous Woodland		Pineywoods: Northern Mesic Hardwood Forest	
Native Invasive: Mesquite Shrubland		Pineywoods: Northern Mesic Pine / Hardwood Forest	
Open Water		Pineywoods: Pine / Hardwood Forest or Plantation	
Pine Plantation 1 to 3 meters tall		Pineywoods: Pine Forest or Plantation	
Pine Plantation > 3 meters tall		Pineywoods: Small Stream and Riparian Baldcypress Swamp	
Pineywoods: Bottomland Baldcypress Swamp		Pineywoods: Small Stream and Riparian Deciduous Successional Shrubland	
Pineywoods: Bottomland Deciduous Successional Shrubland		Pineywoods: Small Stream and Riparian Herbaceous Wetland	
Pineywoods: Bottomland Herbaceous Wetland		Pineywoods: Small Stream and Riparian Seasonally Flooded Hardwood Forest	
Pineywoods: Bottomland Seasonally Flooded Hardwood Forest		Pineywoods: Small Stream and Riparian Temporarily Flooded Hardwood Forest	
Pineywoods: Bottomland Temporarily Flooded Hardwood Forest		Pineywoods: Small Stream and Riparian Temporarily Flooded Mixed Forest	
Pineywoods: Bottomland Temporarily Flooded Mixed Pine / Hardwood Forest		Pineywoods: Small Stream and Riparian Wet Prairie	
Pineywoods: Bottomland Wet Prairie		Pineywoods: Upland Hardwood Forest	
Pineywoods: Disturbance or Tame Grassland		Pineywoods: Wet Hardwood Flatwoods	
Pineywoods: Dry Pine / Hardwood Forest or Plantation		Post Oak Savanna: Oak / Hardwood Slope Forest	
Pineywoods: Dry Pine Forest or Plantation		Post Oak Savanna: Post Oak Motte and Woodland	
Pineywoods: Dry Upland Hardwood Forest		Post Oak Savanna: Savanna Grassland	
Pineywoods: Hardwood Flatwoods		Row Crops	
Pineywoods: Herbaceous Flatwoods Pond		Swamp	
Pineywoods: Herbaceous Seepage Bog		Unclassified	
		Urban High Intensity	
		Urban Low Intensity	



Espey Consultants, Inc.
Environmental & Engineering Services

**LAKE WRIGHT PATMAN
WHITE OAK CREEK WILDLIFE MGMT AREA**
TPWD Texas Ecological Classification Systems 2009
REGION C STUDY PHASE II - 240' msl

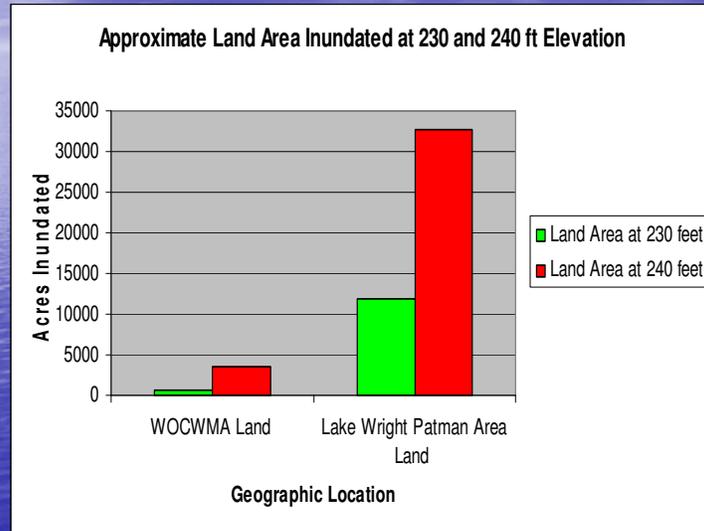
LAKE WRIGHT PATMAN Land Area Inundated

Approximate Land Area Inundated at 230 and 240 ft
(NGVD29) *

	WOCWMA Land (acres)	Lake Wright Patman Area- Wide (acres)
Land Area Inundated at 230 feet	521	11,961
Land Area Inundated at 240 feet	3,596	32,666

* TPWD Letter to Dr. Harkins, Espey Consultants, Inc., dated March 22,2010

LAKE WRIGHT PATMAN



LAKE WRIGHT PATMAN Ecosystem Area Inundated

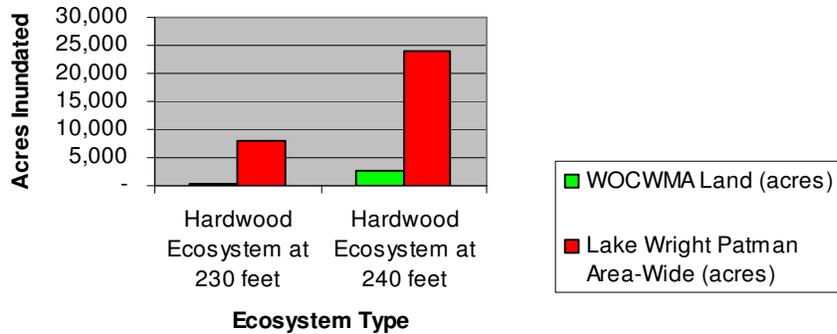
Approximate Ecosystem Acreage Inundated at 230 and 240 ft Elevation (NGVD29) *

	WOCWMA Land (acres)	Lake Wright Patman Area Wide (acres)
Hardwood Ecosystem Inundated at 230'	349	8,101
Herbaceous Wetland Ecosystem at 230'	0	221
Hardwood Ecosystem Inundated at 240'	2,712	24,123
Herbaceous Wetland Ecosystem at 240'	224	557

* TPWD Letter to Dr. Harkins, Espey Consultants, Inc., dated March 22, 2010

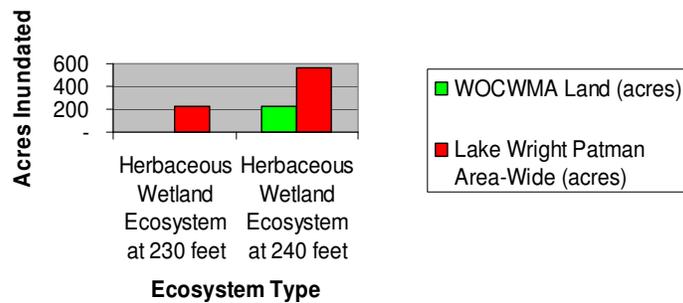
Lake Wright Patman

Hardwood Related Ecosystems - Approximate Acreage Inundated at 230 and 240 ft Elevation (NGVD29)

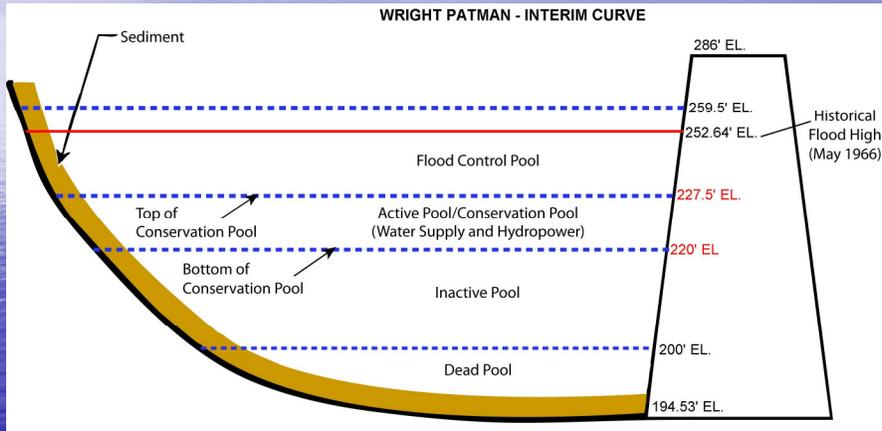


Lake Wright Patman

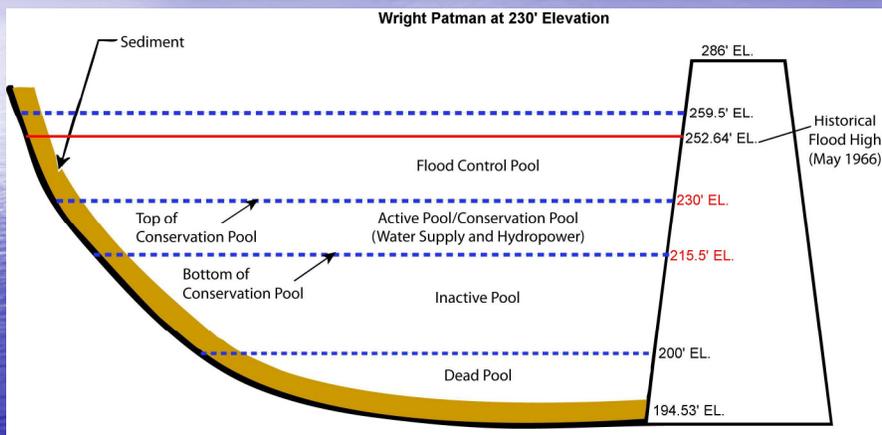
Herbaceous Wetland Ecosystems - Approximate Acreage Inundated at 230 and 240 ft Elevation (NGVD29)



LAKE WRIGHT PATMAN Interim Curve Storage Profile



LAKE WRIGHT PATMAN 230' Flat Curve Storage Profile



Task 1.4

Estimated Yield (afpy) at Different Elevations

Estimate what is the expected yield of Wright Patman under the most reasonably achievable operating scenarios. The additional yield analysis will be performed utilizing the approved water availability model (WAM). Additionally, discussions with Texarkana, TPWD, USACE, and others will be part of this task.

LAKE WRIGHT PATMAN

Estimated Yield Scenario – 230'

**LAKE WRIGHT PATMAN AT 230 FT ELEVATION
ESTIMATED TOTAL FIRM YIELD - 514,505 afpy**

Modeling and Reservoir Operations Criteria

- 230' Upper Conservation Pool (Flat) Operation Curve
- 215.5' Lower Conservation Pool Elevation
- Priority Date set at December 31,2009
- Area Capacity Modification

LAKE WRIGHT PATMAN

Estimated Yield Scenario – 235'

**LAKE WRIGHT PATMAN AT 235 FT ELEVATION
ESTIMATED TOTAL FIRM YIELD - 671,800 afpy**

Modeling and Reservoir Operations Criteria

- 235' Upper Conservation Pool (Flat) Operation Curve
- 215.5' Lower Conservation Pool Elevation
- Priority Date set at December 31,2009
- Area Capacity Modification

Espey Consultants, Inc. April 14, 2010

LAKE WRIGHT PATMAN

Estimated Yield Scenario – 240'

**LAKE WRIGHT PATMAN AT 240 FT ELEVATION
ESTIMATED TOTAL FIRM YIELD - 790,800 afpy**

Modeling and Reservoir Operations Criteria

- 240' Upper Conservation Pool (Flat) Operation Curve
- 215.5' Lower Conservation Pool Elevation
- Priority Date set at December 31,2009
- Area Capacity Modification

Espey Consultants, Inc. April 14, 2010

LAKE WRIGHT PATMAN

Expected Yield (afpy) Summary

Top Elev./Bottom Elev.	Total	Available ^a
228.64 Max (flat) / 215.5 Min	363,717 ^b	183,717
230 Max (flat) / 215.5 Min	514,505	334,505
235 Max (flat) / 215.5 Min	671,800	491,800
240 Max (flat) / 215.5 Min	790,800	610,800
Estimated Yield Marvin Nichols	620,000	496,000 ^c

^a Available Yield of Wright Patman after current 180,000 afpy of Texarkana Water Rights are removed.

^b Freese and Nichols, Inc., 2003, System Operation Assessment of Lake Wright Patman and Lake Jim Chapman, Volume I.

^c 80 % of total Marvin Nichols Yield

Task 1.5

ADDITIONAL INFORMATION NEEDED

Estimate for each operating scenario considered what additional information must be gathered to allow consideration of this strategy as a reasonably equivalent alternative to Marvin Nichols.

What are the implications of these equivalent alternatives (amount of yield available, associated costs for pipeline, mitigation acreage, mitigation costs, etc)? What other alternatives are available in conjunction with Wright Patman (Lake O' the Pines)? How do the combination of those alternatives compare to the equivalent to Marvin Nichols?

Task 1.5 ADDITIONAL INFORMATION NEEDED

Additional Information	Addressed by Basin Wide Study
Mitigation Ratios	Yes
WOCWMA Operations and Impact	Yes
Effects on Downstream Flooding	Yes
Assessment of Cultural and Archaeological Sites	Yes
USACE and State Reallocation Requirements	Partially
Water Right Ownership / Contract	
Instream Flow / Environmental Assessment	Yes
IP Discharge and Impact on Receiving Waters	
Funding	
Others	

Task 1.7 and 1.8 LAKE O' THE PINES Estimated Available Water (afpy)

Estimate what volume of water is available from Lake O' the Pines including permitted water that has not been contracted below 228.5 feet msl. This will be accomplished through discussions with Northeast Texas Municipal Water District (NETMWD).

Estimate volume of water available from existing water right holders (including contracts that may not be fully utilized)

LAKE O' THE PINES Un-contracted Water

Available and Contracted Water Rights *	Approximate Water Rights (afpy)
Available Water (Total Firm Yield)	182,000
NETMWD Contracted Water	-148,000
Available Un-Contracted Permitted Water	34,000

* Region D Initially Prepared Water Plan. March 2010

LAKE O' THE PINES Additional Water Estimates

Potentially Available Water From Existing Water Rights Owners

NETMWD Member Cities **	36,000
U.S. Steel Corporation **	31,000

**** Available through re-negotiated contracts**

Total Estimated Potentially Available Water	67,000
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LAKE O' THE PINES

Total Additional Water Available (afpy)

Available Contract Water	67,000
Un-contracted Water	34,000
Total	101,000

Task 1.10 LAKE O' THE PINES

Reallocation of Flood Storage

Determine if there is additional flood storage over the elevation of 228.5 feet that could be reallocated to water supply. This will be accomplished through additional discussions with NETMWD and the USACE.

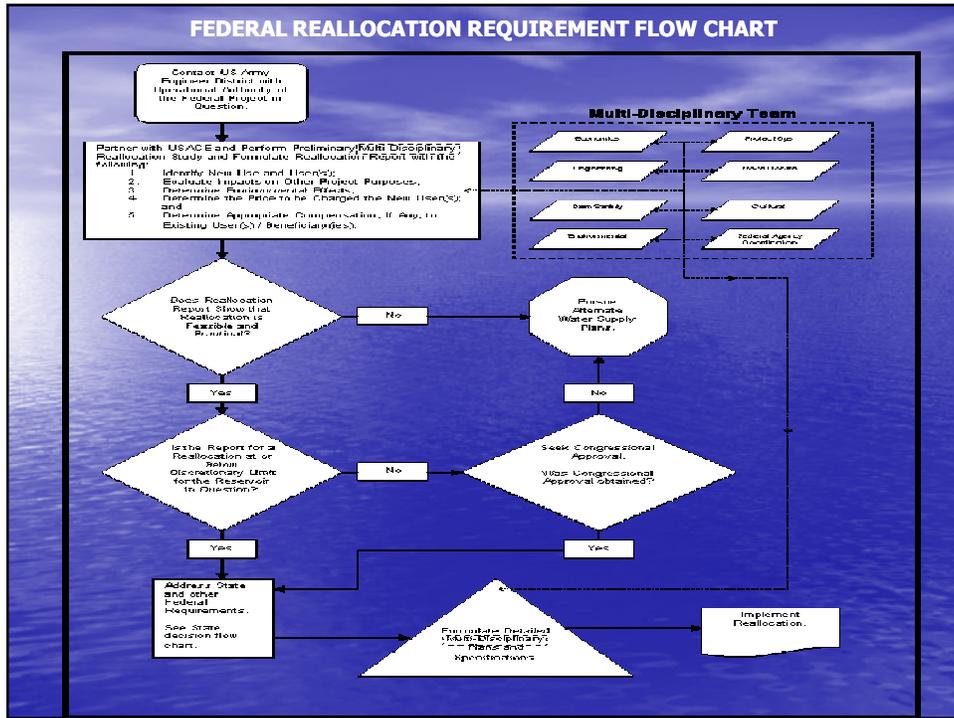
LAKE O' THE PINES

Reallocation Yield Estimate

- LAKE O' THE PINES AT 230.5 FT ELEVATION
- ESTIMATED TOTAL FIRM YIELD – 190,120 afpy
- Modeling and Reservoir Operations Criteria
- 230.5' Upper Conservation Pool (Flat) Operation Curve
- Area Capacity Table Modification

Task 1.11 RESERVOIR REALLOCATION PROCESS

- Congressional Approval is Required to Reallocate Storage Above 50,000 acre-feet or Greater Than 15 Percent of the Total Storage of the Reservoir.
- State And Federal Requirements Apply for Reallocations Greater Than These Limits



FEDERAL REALLOCATION REQUIREMENTS

Partner with USACE to Perform a Reallocation Study

- Identify new Use and User(s)
- Evaluate Impacts on Other Project Purposes
- Determine Environmental Effects
- Determine Price to be Charged New User(s)
- Determine Compensation, if any, to Existing Users

Does Study Show Reallocation is Feasible and Practical?

Is Reallocation Volume at or Below USACE Discretionary Limit?

- Less than 50,000 ac-ft
- Less than 15 percent of total reservoir storage

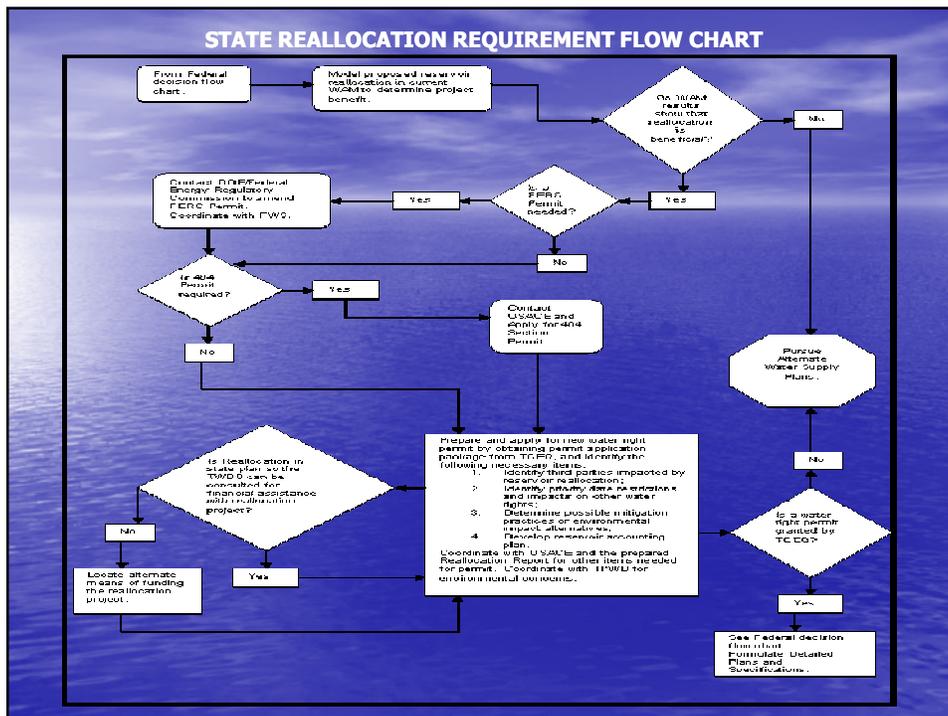
FEDERAL REALLOCATION REQUIREMENTS (cont)

Seek Congressional Approval if Above Discretionary Limit Address Other Federal Requirements

- Environmental Assessment and Possible Environmental Impact Statement
- Section 404 Permit Requirements
- Federal Energy Regulatory Commission (FERC) Requirements
- Mitigation Requirements
- Inventory and Assessment of any Culturally Significant, Historical and Archaeological Sites or Artifacts

Address State of Texas Requirements

- Formulate Multi-Disciplinary Plans and Specifications
- Implement Reallocation



STATE REALLOCATION REQUIREMENTS

Model Reservoir Reallocation in Current WAM

Do WAM Results Demonstrate Reallocation is Beneficial?

Apply for Water Right Permit with TCEQ

- Identify Third Parties Impacted by Reallocation
- Identify Priority Date Restrictions and Impacts on Other Water Rights
- Determine Possible Mitigation or Environmental Impact Alternatives
- Develop Reservoir Accounting Plan

Coordinate With TPWD for Environmental Concerns

Coordinate With USACE and the Prepared Reallocation Report

Obtain Financial Assistance for Reallocation Project

- If Reallocation is in State Plan then Consult with TWDB for Financial Assistance

If Water Right Permit Granted by TCEQ

- Formulate Detailed Plans and Specifications

QUESTIONS ?