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)

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

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

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

* 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.

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 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) (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

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

Land Area Inundated

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

<table>
<thead>
<tr>
<th>Land Area Inundated at 230 feet</th>
<th>WOCWMA Land (acres)</th>
<th>Lake Wright Patman Area-Wide (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>521</td>
<td>11,961</td>
</tr>
<tr>
<td>Land Area Inundated at 240 feet</td>
<td>3,596</td>
<td>32,666</td>
</tr>
</tbody>
</table>

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

Approximate Land Area Inundated at 230 and 240 ft Elevation

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

<table>
<thead>
<tr>
<th>Ecosystem Type</th>
<th>WOCWMA Land (acres)</th>
<th>Lake Wright Patman Area Wide (acres)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardwood Ecosystem Inundated at 230'</td>
<td>349</td>
<td>8,101</td>
</tr>
<tr>
<td>Herbaceous Wetland Ecosystem at 230'</td>
<td>0</td>
<td>221</td>
</tr>
<tr>
<td>Hardwood Ecosystem Inundated at 240'</td>
<td>2,712</td>
<td>24,123</td>
</tr>
<tr>
<td>Herbaceous Wetland Ecosystem at 240'</td>
<td>224</td>
<td>557</td>
</tr>
</tbody>
</table>

* 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)

<table>
<thead>
<tr>
<th>Ecosystem Type</th>
<th>Acres Inundated</th>
</tr>
</thead>
<tbody>
<tr>
<td>WOCWMA Land (acres)</td>
<td>Lake Wright Patman Area-Wide (acres)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Ecosystem Type</th>
<th>Acres Inundated</th>
</tr>
</thead>
<tbody>
<tr>
<td>WOCWMA Land (acres)</td>
<td>Lake Wright Patman Area-Wide (acres)</td>
</tr>
</tbody>
</table>
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

Eispey Consultants, Inc. April 14, 2010
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

<table>
<thead>
<tr>
<th>Top Elev./Bottom Elev.</th>
<th>Total</th>
<th>Available&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>228.64 Max (flat) / 215.5 Min</td>
<td>363,717&lt;sup&gt;b&lt;/sup&gt;</td>
<td>183,717</td>
</tr>
<tr>
<td>230 Max (flat) / 215.5 Min</td>
<td>514,505</td>
<td>334,505</td>
</tr>
<tr>
<td>235 Max (flat) / 215.5 Min</td>
<td>671,800</td>
<td>491,800</td>
</tr>
<tr>
<td>240 Max (flat) / 215.5 Min</td>
<td>790,800</td>
<td>610,800</td>
</tr>
<tr>
<td>Estimated Yield Marvin Nichols</td>
<td>620,000</td>
<td>496,000&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<sup>a</sup> Available Yield of Wright Patman after current 180,000 afpy of Texarkana Water Rights are removed.

<sup>b</sup> Freese and Nichols, Inc., 2003, System Operation Assessment of Lake Wright Patman and Lake Jim Chapman, Volume I.

<sup>c</sup> 80% of total Marvin Nichols Yield

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## 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

<table>
<thead>
<tr>
<th>Additional Information</th>
<th>Addressed by</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mitigation Ratios</td>
<td>Yes</td>
</tr>
<tr>
<td>WOCWMA Operations and Impact</td>
<td>Yes</td>
</tr>
<tr>
<td>Effects on Downstream Flooding</td>
<td>Yes</td>
</tr>
<tr>
<td>Assessment of Cultural and Archaeological Sites</td>
<td>Yes</td>
</tr>
<tr>
<td>USACE and State Reallocation Requirements</td>
<td>Yes</td>
</tr>
<tr>
<td>Water Right Ownership / Contract</td>
<td>Partially</td>
</tr>
<tr>
<td>Instream Flow / Environmental Assessment</td>
<td>Yes</td>
</tr>
<tr>
<td>IP Discharge and Impact on Receiving Waters</td>
<td></td>
</tr>
<tr>
<td>Funding</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Available and Contracted Water Rights *</th>
<th>Approximate Water Rights (afpy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Water (Total Firm Yield)</td>
<td>182,000</td>
</tr>
<tr>
<td>NETMWD Contracted Water</td>
<td>-148,000</td>
</tr>
<tr>
<td>Available Un-Contracted Permitted Water</td>
<td>34,000</td>
</tr>
</tbody>
</table>

* Region D Initially Prepared Water Plan. March 2010

---

**LAKE O’ THE PINES**  
Additional Water Estimates

<table>
<thead>
<tr>
<th>Potentially Available Water From Existing Water Rights Owners</th>
</tr>
</thead>
<tbody>
<tr>
<td>NETMWD Member Cities **</td>
</tr>
<tr>
<td>U.S. Steel Corporation **</td>
</tr>
</tbody>
</table>

** Available through re-negotiated contracts

| Total Estimated Potentially Available Water | 67,000 |
LAKE O’ THE PINES
Total Additional Water Available (afpy)

<table>
<thead>
<tr>
<th>Available Contract Water</th>
<th>67,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Un-contracted Water</td>
<td>34,000</td>
</tr>
<tr>
<td>Total</td>
<td>101,000</td>
</tr>
</tbody>
</table>

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 REQUIREMENT FLOW CHART
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 ?