



## TECHNICAL MEMORANDUM

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**TO:** File, NTD07286

**FROM:** Andres Salazar, Tom Gooch, Simone Kiel  
Freese and Nichols, Inc.

**SUBJECT:** Toledo Bend Pipeline Project Coordination Activities

**DATE:** March 23, 2009

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The 2006 Region C water plan recommends moving water from Toledo Bend Reservoir to water providers in Region C. This project, as currently proposed, involves transporting up to 400,000 acre-feet per year of water from Toledo Bend Reservoir to water providers in Region C, with the potential to increase this amount to 600,000 acre-feet per year. The project also recommends transporting 100,000 acre-feet per year to customers of the Sabine River Authority in Region D.

Since the development of this strategy for the 2006 regional water plans, there have been on-going developments of water supplies by the Region C providers and the East Texas Region. This study was conducted to better understand these changes and the impacts to the proposed Toledo Bend Pipeline Project.

The East Texas Region is the lead sponsor of the Toledo Bend Pipeline Study. Region C is a participant in the study as the primary recipient of the water from the project. Region C's involvement includes 1) participating in the coordination meetings with the major water providers to confirm supply amounts and delivery locations and 2) review of the work developed by the East Texas Region consultants and provide comments.

This memorandum presents a brief synopsis of the coordination activities attended by the Region C consultants. Meeting notes from each of the coordination meetings are included in Attachment A. The review comments on the draft Toledo Bend Pipeline Study Report is included in Attachment B.

### **Coordination Activities:**

Freese and Nichols met individually with Tarrant Regional Water District, Dallas Water Utilities, North Texas Municipal Water District, and the Sabine River Authority to discuss possible routes of the pipeline from Toledo Bend and confirm delivery amounts. These meetings were held between April and June 2008. The following is a summary of the key considerations discussed at these meetings for the layout of the facilities.

### **Delivery Amounts**

- Dallas Water Utilities (DWU): 200,000 acre-feet per year. (The Toledo Bend Project is still an alternative strategy for DWU. Pending the development of DWU's recommended strategies, DWU may decide not to participate in this project).
- Tarrant Regional Water District (TRWD): 200,000 acre-feet per year.
- North Texas Municipal Water District (NTMWD): 200,000 acre-feet per year.
- Sabine River Authority (SRA): 100,000 acre-feet per year.

### **Peak Factor**

- For planning purposes, this study will assume a peak factor of 1.25. This factor assumes that other sources have enough peak capacity if needed. Peak capacity needs could be different in the future.

### **Delivery Points**

Water should be delivered to the areas with growth or future water treatment plants. The preferred delivery points are:

- TRWD: Near Lake Benbrook
- DWU: Near Joe Pool Lake (new water treatment plant in southwest Dallas), and at Lake Tawakoni
- NTMWD: Near new Lake Tawakoni WTP.
- SRA: Half of SRA water delivered to Longview/Kilgore/Henderson/Marshall area. The other half delivered to the Lake Tawakoni Area.

### **DWU Participation**

Toledo Bend is an alternative strategy for Dallas. If the recommended strategies for DWU are more feasible, DWU may not be participating in this project. For this study, the costs of the preferred alternative were calculated with and without participation of DWU.

### **Preferred Route**

Based on discussions with the major participants, the pipeline to the Metroplex suppliers should have the shortest route possible. Pumping should be from pump station to pump station, where possible. It is preferred not to discharge to intermediate reservoirs (Lake Palestine and Cedar Creek) because discharging to a reservoir loses head and increases power costs. Pipelines could run near these reservoirs and could have the option to discharge water there to increase operational flexibility, but such discharges should not be frequent. SRA prefers to discharge in Prairie Creek (near the Longview area) and Lake Tawakoni.

**ATTACHMENT A**  
**COORDINATION MEETING NOTES**



## MEMORANDUM

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**TO:** File, SCP07481, 2.14  
**FROM:** Simone Kiel  
**SUBJECT:** Meeting with TRWD on April 9, 2008  
**DATE:** May 8, 2008

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A meeting was held with the Tarrant Regional Water District (TRWD) on April 9, 2008 at TRWD's office to discuss the Toledo Bend study for the Regions C and I regional water plans.

**Attendees:**

TRWD: Wayne Owen, David Marshall  
FNI: Tom Gooch, Simone Kiel

The following presents highlights of the discussions.

1. The 200,000 ac-ft/yr of water from Toledo Bend as assumed for the Region C plan is still a good number. For planning purposes, use 200,000 ac-ft per year.
2. TRWD will probably not oversize the 3<sup>rd</sup> pipeline from Richland-Chambers/Cedar Cedar to accommodate Toledo Bend water because the timing is too far in the future. Need to price project as a separate pipeline. Use peaking factor of 1.25.
3. Focus routing study on the shortest pipeline route. Use scenario with pump station near Lindale.
4. David Marshall expressed concern about placing water in creek beds in Lake Palestine watershed due to potentially highly erodible soils in the watershed (Blackland Prairie ecoregion). This was looked at previously and not considered for this reason. TRWD suggested that pipelines should be used to move water.
5. At this time, TRWD does not see an advantage to pumping water through Palestine. TRWD suggested a pipeline from the pump station near Lindale to the pump station at Cedar Creek, with the option to place the water in Cedar Creek Reservoir if needed. TRWD's preference is to pump from pump station to pump station to not break head at the reservoirs.
6. TRWD is open to sharing pipelines with DWU if there is a cost advantage. This also applies to moving water through Lake Palestine. FNI will need to look at the life cycle costs for a pipeline to Lake Palestine versus directly to Cedar Creek.
7. Assume pipeline route from Cedar Creek follows existing pipelines.
8. The joint study with DWU is on-going. TRWD should have some draft information

shortly. The use of the Richland-Chambers/ Cedar Creek pipeline for this study is no longer applicable.

**Action Items:**

1. FNI will compare costs for routing water through Palestine versus a direct route to Cedar Creek Reservoir.
2. FNI will schedule meetings with DWU, NTMWD and SRA to discuss possible shared facilities.
3. FNI will follow-up with TRWD after completion of analyses.



## MEMORANDUM

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**TO:** File, SCP07481, 2.14  
**FROM:** Andres Salazar  
**SUBJECT:** Meeting with DWU on May 15, 2008  
**DATE:** May 15, 2008

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A meeting was held with Dallas Water Utilities on May 15, 2008 at the Dallas City Hall to discuss the Toledo Bend study for the Regions C and I regional water plans.

**Attendees:**

TRWD: Denis Qualls, Bobby Praytor  
FNI: Tom Gooch, Andres Salazar

The following presents highlights of the meeting:

1. Toledo Bend is an alternative water management strategy for DWU. DWU needs to resolve first uncertainties of the recommended alternatives (Wright Patman and Fastrill).
2. Use peaking factor of 1.25 for Toledo Bend.
3. A feasible route is similar to the connection from Lake Palestine that is being analyzed by KBR/CDM. The pipeline starts in Lake Palestine and goes between Richland Chambers and Cedar Creek, continuing to a new water treatment plant in Joe Pool Lake.
4. Denis Qualls provided proposed routes by CDM/KBR.
5. DWU is open to sharing pipelines with TRWD if there is a cost advantage. This also applies to moving water through Lake Palestine.

**Action Items:**

1. FNI will follow-up with DWU and other water suppliers after completion of analyses.



## MEMORANDUM

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**TO:** File, NTD-07286  
**FROM:** Tom Gooch  
**SUBJECT:** Meeting with Jack Tatum of Sabine River Authority on June 5, 2008  
**DATE:** June 10, 2008

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I met with Jack Tatum of the Sabine River Authority at the Texas Water Conservation Association meeting in Galveston on June 6, 2008. We discussed plans for delivery of water from Toledo Bend Reservoir to the upper Sabine Basin and the Metroplex.

The following presents highlights of the discussions:

1. I talked about the meetings we have had with Dallas, Tarrant Regional Water District, and North Texas Municipal Water District.
  - NTMWD and TRWD still want to plan for 200,000 acre-feet per year each
  - Dallas wants to plan for 200,000 acre-feet per year as an alternative supply.
  - TRWD would be delivered near Lake Benbrook, NTMWD to the Tawakoni WTP near Lake Tawakoni, and Dallas near Joe Pool Lake.
  - A peaking factor of 1.25 would be used for planning purposes.
2. I showed Jack potential routes based on input from the Metroplex suppliers – a southern route south of Palestine and Cedar Creek with a branch north to NTMWD and a northern route north of Palestine and Cedar Creek.
3. Jack said that for planning purposes, the following assumptions seem reasonable for SRA:
  - 50,000 acre-feet per year delivered to the Longview area
  - 50,000 acre-feet per year delivered to the Lake Tawakoni area.
  - 1.25 peaking factor
4. Jack said that the northern route is preferable to the southern route for SRA because it is nearer to their basin. However, the main point is to get a system that will meet long-term needs in the upper basin.
5. Jack will discuss these issues with Jerry Clark to confirm SRA's preferences.

**ATTACHMENT B**

**COMMENTS ON EAST TEXAS REGION DRAFT STUDY REPORT**

## DRAFT MEMORANDUM TO FILE

<b>DRAFT</b>
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THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF THOMAS C. GOOCH, P.E., TEXAS NO. 50668 ON DECEMBER 29, 2008. IT IS NOT TO BE USED FOR CONSTRUCTION, BIDDING OR PERMIT PURPOSES.
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From: Tom Gooch, Freese and Nichols, Inc.

Date: December 29, 2008

Project: NTD-07286, Region C

File: NTD07286\T\Study 2 – Toledo Bend Study\Comments.doc

Subject: Comments on December 2008 Draft Report *East Texas Region Special Study No. 1: Inter-Regional Coordination on the Toledo Bend Project*

We have reviewed the December 2008 Draft Report *East Texas Region Special Study No. 1: Inter-Regional Coordination on the Toledo Bend Project*, prepared by Schaumburg and Polk, Inc., Freese and Nichols, Inc., and Alan Plummer Associates, Inc. for the East Texas Regional Planning Group. The draft report provides a useful update of the cost of the proposed project and basic information on possible water quality concerns and environmental flow issues. Based on our review, we offer the following comments on the draft report:

### More Substantive Comments

1. In Section 2, it would be useful to summarize the changes from the 2006 plan, perhaps in a text box. Changes include the pump station location on Toledo Bend reservoir, the delivery points for NTMWD and Dallas, and TRWD's decision to use a separate pipeline for Toledo Bend flows. All of these changes have an impact on the project cost.
2. The Right of Way cost should be expressed on a per linear foot basis. The cost per acre for rural areas appears high when rural acreages sell at much lower costs (\$2,000 to \$3,000 per acre).
3. It is not clear from the report what the peak delivery rates are in each pipeline segment and what peaking factors are used. The peak flow for each segment should be added to Tables 2.1 and 2.2.

4. On page 2-7, the report should indicate that the 2006 regional water plans used Second Quarter 2002 unit prices in the cost estimates, as required by the Texas Water Development Board.
5. The life cycle cost was conducted assuming that the discount and inflation rate are the same (3.5 percent per year). This is an unusual approach. It is usually assumed that the discount rate (which reflects the time value of money) is 2 percent per year to 4 percent per year higher than inflation. The result of assuming that discount rate and inflation are the same is to make the purchase of (say) a certain amount of electricity 100 years from now as important as the purchase of the same amount of electricity today. (The price is inflated by 3.5 percent per year and then reduced by the same 3.5 percent per year to get present value.) We recommend that the life cycle cost consider the effect of a larger discount rate, at least 5 percent per year.
6. The discussion of life cycle costs and the tables and figures should make it clear whether the costs and unit costs discussed are discounted present worth costs, estimated future costs with inflation, or costs at 2007 prices.
7. On page 3-5, the text discusses the regulations controlling power plant intakes (Title 40 CFR 122, Section 316(b)). Water supply intakes are not governed by Section 316(b) regulations, and the intakes do not usually meet these standards. The reference should be removed.
8. In Section 3, it might be useful to compare chlorophyll “a” and total organic carbon (TOC) levels in the various reservoirs.
9. On page 4-9, the text should point out that the median historical flows from 1940 through 1996 are very near the 1969-1996 values, considering natural variations in flow. The text could be read to imply that the reservoirs caused an increase in flows by releasing more water in the summer. It would be clearer to say “Since the

reservoirs were constructed, inflows to the bay have tended to be higher from July through October (traditional low-flow months). This is probably due to the release of stored water from the reservoirs during the hotter summer months for power generation and to mitigate salt water intrusion.”

10. Figure 4.6 should follow Figure 4.4 at the end of Section 4.2.3 and be renumbered as Figure 4.5. Text should be added to discuss the figure: “Figure 4.5 shows the monthly median historical inflows to the bay and the naturalized inflows that would have occurred without human activity. The figure shows that human activity has reduced flows in January, February, May, and December, probably primarily due to the storage of flows in reservoirs. On the other hand, human activity has increased flows in July, August, and September, probably primarily due to the release of stored water for hydropower generation. Overall, human activity has reduced annual median flows slightly (by about 2.7 percent, from 14.9 million acre-feet per year to 14.5 million acre-feet per year), probably primarily by the use of water for municipal, industrial, and irrigation purposes and evaporation from reservoirs.” Section 4.3.1 would be removed.
11. I would suggest adding a bullet to Section 4.4 discussing the application of TPWD’s inflow targets. “The available data shows that the target inflows recommended for Sabine Lake by TPWD cannot be met under drought conditions, even if all existing uses of water are abandoned and the reservoirs in the watershed are dedicated solely to environmental flows. It is unclear how the suggested TPWD targets would be applied under drought conditions.”
12. In addition to our comments, the Upper Trinity Regional Water District (UTRWD) submitted comments to the Region C Water Planning Group on December 8, 2008. The UTRWD comments are attached to this memorandum for your consideration.

**DRAFT MEMORANDUM TO FILE** from Tom Gooch, Freese and Nichols, Inc.

December 29, 2008

Comments on December 2008 Draft Report *East Texas Region Special Study No. 1: Inter-Regional Coordination on the Toledo Bend Project*

Page 4 of 4

**Minor Editorial Comments:**

- Page 4-10, add “, 400,000 acre-feet per year higher than historical values” at the end of the first sentence of the last paragraph.
- It would be helpful to include the design peak flow capacity for each segment on the cost tables in Appendix B.

## Stephanie Griffin

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**From:** Larry Patterson [lpatterson@utrwd.com]  
**Sent:** Friday, December 05, 2008 4:33 PM  
**To:** Stephanie Griffin  
**Cc:** Thomas E. Taylor, Executive Director; Sandy Cash; Tom Gooch; Simone Kiel  
**Subject:** RE: Draft Report on Toledo Bend (UTRWD Comments)

Stephanie:

Just got a chance to review the report and would like to offer these comments. My initial thought is that the Region C Water Plan (as finally adopted in the 2007 State Water Plan) also shows Toledo Bend to be an alternate Water Management Strategy for UTRWD (please review Region C Water Planning Group document pages 4E.3-4, 4E.38 - 43, Table 4E.16 and Appendix U table U-95).

Regarding the Draft Report on Toledo Bend, please consider adding a footnote on page 2-1, Section 2.0 Strategy update, 2.1 Demand Coordination, as follows:

**Note. Water from Toledo Bend is listed in the Region C Water Planning Group Plan on page 4E.3, 4E.4, 4E.43, Table 4E.16 and Appendix U; Table U-95 as an alternative water source for Upper Trinity Regional Water District, (UTRWD). An important fact to note is that UTRWD is within the established Raw Water Planning area of Dallas Water Utilities (DWU). Since UTRWD is an existing wholesale raw water customer of Dallas, if Dallas were to participate in the Toledo Bend Project, UTRWD could receive indirect benefit of Toledo Bend Water by making additional purchases of raw water under its existing or extended contract with Dallas.**

This comment is send with to make sure that there is no confusion related to the District's intend to seek additional raw water from DWU and / or other primary or alternative water management strategies listed in the State Water Plan. Should you have any questions, please give me a call: office (972) 219-1228 or cell (214) 673-7497.

Regards

Larry N. Patterson  
Director of Operations & Water Resources  
Upper Trinity Regional Water District

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**From:** Stephanie Griffin [mailto:swg@freese.com]

**Sent:** Tuesday, December 02, 2008 1:20 PM

**To:** Andrew Chastain-Howley (ach@wprconsulting.com); Bill Madden (bmadden@maddensecurities.com); Bill Meadows (meadows@wrigg.com); Bob Johnson (Robert.johnson2@dallascityhall.com); Bobby Praytor (bobby.praytor@dallascityhall.com); Byron Hardin (bhardin@brwncald.com); Candy Scott; Carole Bassinger (cbassing@cityoflewisville.com); Chad Watt (cwatt@bizjournals.com); Chip Perryman (Chip@MyCVC.net); Curtis Campbell (E-mail); David Brock (david.brock@jacksonville.tx.org); Dennis King (dking@ci.irving.tx.us); Don Doering; Don Ives; Frances Pelley (fpelley@texoma.cog.tx.us); Frank Espino (fespino@tceq.state.tx.us); James Burnett (jburnett@texoma.cog.tx.us); Jim Thompson (jimthompson@wardtimber.com); jisensee@jdconsult.com; Joyce Godwin (jgodwin@herald-democrat.com); Julie Hunt; Ken Griffin (kgriffin@ci.coppell.tx.us); Larry Patterson; Lila Marsh (lmarsh@velaw.com); Linda Christie (TRWD); Mark Newhouse (boisdarcumud@earthlink.net); Mary Gugliuzza; Melissa Paschall-Thompson (Melissa.paschall@dallascityhall.com); Mike Adams; Mike Shook; Nancy Cline; Omas L. Peterson (omaspeterson@aol.com); pantegocm@sbcglobal.net; Penny MacDonnell (gemacdon@usgs.gov); Phil Curtis; Randy Loftis (rloftis@dallasnews.com); Richard Dormier (richard@fmi-dallas.com); Robert Gresham (metgcd@tconline.net); Robert McCarthy; Roy Eaton (REatonWCM@aol.com); Sam Brush (sbrush@nctcog.org); Sam Scott (scotts@trinityra.org); Sandy Cash; Scarlett Dale (sdale@dallaschamber.org); Terry Hafer (hafert@cityofalvarado.org); Todd Reck (treck@ci.irving.tx.us); Thomas E. Taylor, Executive Director; Vic Suhm (E-mail); Wayne Owen (wowen@trwd.com)

**Subject:** Draft Report on Toledo Bend

Good Afternoon!

I have posted Region I's DRAFT Report on Toledo Bend on the Region C web site. I have also posted a draft memo with suggested responses to the draft report. Region C's responsibility is to review the Region I report and provide comments to the TWDB and Region I on the report. If you have any questions, please let me know.

The documents can be accessed at <http://www.regioncwater.com/Meetings/index.cfm>

Sincerely,  
Stephanie

**Stephanie W. Griffin, P.E.**  
Water Resources Planning

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