



# TRIANGLE J COUNCIL OF GOVERNMENTS

W o r l d

C l a s s

R e g i o n

4307 Emperor Boulevard, Suite 110  
Durham, NC 27703

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www.tjco.org

May 14, 2014

Ms. Vicki Westbrook  
Deputy Director, Department of Water Management  
City of Durham  
101 City Hall Plaza  
Durham, NC 27701

Re: Proposed changes to Durham Contract for Jordan Lake Regional Water Supply Study, Phase II

Dear Ms. Westbrook,

Please find attached a proposed revision to the scope and budget for Phase II of the Regional Water Supply Plan project being conducted for the Jordan Lake Partnership. This proposed revision would increase the scope and budget to a maximum of \$158,530, an increase of \$62,830 from the currently contracted scope and budget of \$95,700.

This proposed revision is in recognition of an expanded *Triangle Region Water Supply Plan (TRWSP) Volume II: Regional Alternative Analysis* Report from what was scoped as well as substantial changes to the base data from the Volume I report. The scope assumed that water service areas, population estimates, demand projections, water supply yields, future water needs would carry forward unchanged from the *TRWSP Volume I: Regional Needs Assessment*. This assumption did not hold true, as changes were made to the base data for 10 of 13 JLP systems. Major changes requiring iterative support were made for Durham, Orange County, Pittsboro, and Raleigh. Minor changes were made for Cary, Apex, Morrisville, Wake County-RTP South (CAMR), OWASA, and Holly Springs. The major changes required substantive changes to the future water supply source options and regional alternatives, and all changes required updating the source selection spreadsheet tools, regional tables and figures in the report, and accompanying text descriptions. The scope included a draft and final report, and a Review Draft and Revised Draft have been prepared. An additional round of review and revisions will be needed to prepare a final Volume II report. An Executive Summary covering both Volume I and Volume II will also be prepared as a stand alone document.

The proposed revisions also include additional OASIS modeling support needed by TJCOG and HydroLogics. It was anticipated in the scope that the model structure would be adequate and future scenarios would require updating input values and operating code. However, it was determined that significant changes were needed to the model structure to better represent JLP systems and future water supply sources, especially for Raleigh, Durham, Orange County and CAMR. This required additional effort working with the partners and HydroLogics as well as additional support from Hydrologics.

Two additional tasks have been added to the proposed scope for supporting JLP presentations and the Western Intake Feasibility Study. The proposed scope includes the time needed to prepare slides and presentation graphics and supporting presentations about the Partnership and regional water supply plan. The support for the Western Intake Feasibility Study includes working with the Hazen & Sawyer (H&S) to provide information and data including regional water demand projections, water supply yields, water needs, anticipated JL allocation requests, monthly demand patterns, future water supply alternatives and

## MISSION STATEMENT

*To serve as an intergovernmental organization for local elected officials  
that works proactively on regional issues in order to sustain and improve the quality of life for our citizens.*

implementation options, and the draft TRWSP; as well as participating in meetings and discussions, and reviewing H&S meeting summaries and alternatives and cost drafts.

During the course of executing the project, these changes were requested of TJCOG and required to ensure a high-quality regional water supply plan that meets the future water supply needs of each partner and the region as a whole. These changes have been completed, with the exception of conducting a final round of review and revisions to the TRWSP Volume II report and stand-alone Executive Summary, which will be completed in August 2014.

These changes were necessary and substantially improved the quality of the regional water supply plan, which represents an historic consensus for meeting the future water supply needs of the Triangle Region. It is recommended that the cost for the Western Intake support be distributed to the four participating entities. For the increased scope for Tasks 1, 2 and 6, it is estimated that 50% of the effort was the result of substantial changes to foundational data since Volume I, attributed primarily to Durham, Orange County, Pittsboro, and Raleigh, and the remaining 50% of the additional effort were overall changes that benefited all of the partners. As such, TJCOG recommends the following cost distribution:

Total additional cost: \$62,830

- Cost based on changes to base data for Durham, Orange County, Pittsboro, and Raleigh: \$30,140
- Cost based on overall changes benefiting all partners: \$30,140
- Cost based on Western Intake support: \$2,550

Partner	Data Changes		Overall Changes		Western Intake Support		TOTAL
	Cost Share	Cost	Cost Share	Cost	Cost Share	Cost	Cost
Town of Apex			13.04%	\$3,930.26			\$3,930.26
Town of Cary			13.04%	\$3,930.26			\$3,930.26
Chatham County			4.35%	\$1,311.09	25%	\$637.50	\$1,948.59
City of Durham	25%	\$7,535.00	13.04%	\$3,930.26	25%	\$637.50	\$12,102.76
Town of Hillsborough			4.35%	\$1,311.09			\$1,311.09
Town of Holly Springs			4.35%	\$1,311.09			\$1,311.09
Town of Morrisville			4.35%	\$1,311.09			\$1,311.09
Orange County	25%	\$7,535.00	4.35%	\$1,311.09			\$8,846.09
OWASA			13.04%	\$3,930.26	25%	\$637.50	\$4,567.76
Town of Pittsboro	25%	\$7,535.00	4.35%	\$1,311.09	25%	\$637.50	\$9,483.59
City of Raleigh	25%	\$7,535.00	13.04%	\$3,930.26			\$11,465.26
City of Sanford			4.35%	\$1,311.09			\$1,311.09
Wake County			4.35%	\$1,311.09			\$1,311.09
		\$30,140.00		\$30,140.00		\$2,550.00	<b>\$62,830.00</b>

If you have any questions or if I can provide any additional information, please do not hesitate to contact me at 919-295-0017 or [mschlegel@tjco.org](mailto:mschlegel@tjco.org). Thank you for the opportunity to assist you with this very important project. We look forward to continuing to work with the City of Durham and the Jordan Lake Partnership on this landmark study.

Sincerely,



Michael B. Schlegel,  
Water Resources Program Manager

MISSION STATEMENT

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## Jordan Lake Partnership Regional Water Supply Study Phase II Project Proposal

July 30, 2012  
(Updated May 14, 2014)

### Scope of Services

#### **Task 1. Develop Phase II and Final Draft Triangle Region Water Supply Plan for Jordan Lake.**

TJCOG will work with the Partners to develop a complete regional water supply plan and peer-reviewed alternatives for meeting future water supply needs in the Region suitable for supporting Jordan Lake water supply storage allocation applications.

1. TJCOG will work with local water supply system staffs to develop future individual system water supply source options and alternatives.
2. TJCOG will confirm projected future water supply needs and water supply assumptions.
3. TJCOG will review individual system source options and alternatives and develop a regional compilation of source options.
4. TJCOG will work with the Technical Review Team to develop regional alternatives.
5. TJCOG will work with local water supply system staffs to document the assumptions and expectations for water efficiency, water conservation, demand management and reclaimed water use in the future.
6. TJCOG will develop and facilitate a peer-review for water supply alternatives and system summaries
7. TJCOG will meet with local water supply system staffs to reconcile any discrepancies between system alternatives.
8. TJCOG will work with local water supply system staffs and their consultants to finalize current water supply safe yields.
9. TJCOG will work with local water supply system staffs to finalize Jordan Lake water supply storage allocation needs.
10. TJCOG will work with the Technical Review Team to develop agreement on a preferred regional water supply alternative.
11. TJCOG will draft a technical memorandum comprising the Phase II Triangle Region Water Supply Plan.

Jul 30, 2012 (updated May 14, 2014)

Scope Page 1 of 5

- a. *The content of the TRWSP deliverable for this task was expanded from the outline from which the 2012 scope was developed, which required considerable additional effort.*
  - b. *There were significant revisions to population estimates, water demand projections, service areas, water supply yields and preferred water supply scenarios for several partners on multiple occasions (Durham, Pittsboro, Raleigh, Orange County), as well as minor revisions for other partners (CAMR, OWASA, Holly Springs). In total, 10 of 13 systems revised their data, which improved the regional plan, but required significant support and multiple revisions to all the tables and figures in the report.*
12. JLP will review the draft technical memorandum and provide comments.
13. ~~TJCOG will produce a final draft technical memorandum incorporating both the Phase I needs assessment and the Phase II regional alternatives.~~
13. *TJCOG will produce a final technical memorandum of the Phase II regional alternatives.*
- a. *TJCOG produced a Review Draft and an updated Revised Draft based on JLP feedback. An additional round of review and updates will be required for the Final TRWSP Volume II.*
  - b. *TJCOG will produce a standalone Executive Summary document that summarizes Volume I and Volume II.*

## **Task 2. Develop Hydrologic Analyses to Support Jordan Lake Allocation Requests.**

TJCOG will use the draft updated Cape Fear River/Neuse Rive Basin Hydrologic Model (Model) to analyze the hydrologic impacts of Jordan Lake Partnership water supply alternatives and requested Jordan Lake water supply storage allocations under various scenarios. Model scenarios might include the following:

- Current conditions, with the US Army Corps of Engineers (USACE) Jordan Lake drought protocol
  - 2040 conditions, with the USACE Jordan Lake drought protocol (up to 3 alternatives)
  - 2060 conditions, with the USACE Jordan Lake drought protocol (up to 3 alternatives)
1. TJCOG will review the data in the 2030 and 2050 base scenarios to confirm input values.
  2. TJCOG will develop Model ~~2040~~ 2045 and 2060 scenarios (up to 3 alternatives) based on the updated input spreadsheets.
    - a. *There were significant changes needed to the model structure to correctly represent the JLP systems, operations and future water supply sources, especially to Raleigh, Durham, Orange County and CAMR. Additional effort was required to coordinate with the partners and HydroLogics to review and incorporate the revisions.*
  3. TJCOG will work with JLP and DWR to develop Model scenario variations as necessary.
  4. TJCOG will document the inputs and assumptions for each model scenario and model run.
  5. TJCOG will run the Model for the available period of record under varying levels of Jordan Lake water supply demands based on the various scenarios.
  6. TJCOG will analyze Model outputs and present those analyses.
  7. TJCOG will use the Model to verify or calculate reservoir safe yields.
  8. TJCOG will work with JLP and DWR to refine Model output analysis and presentation.
  9. TJCOG will produce draft technical memoranda discussing the Model outputs and analyses, as necessary.

10. JLP will review the draft technical memoranda and provide comments.
11. TJCOG will produce final technical memoranda incorporating the comments from JLP.

### **Task 3. Assist Jordan Lake Partnership in Working with a Consultant for Jordan Lake Allocation Applications.**

TJCOG will provide assistance in selecting a consultant that will prepare Jordan Lake water supply storage allocation applications for each member of the Jordan Lake Partnership interested in obtaining a new or increased allocation. Furthermore, TJCOG will provide technical support to any consultant with which the Jordan Lake Partnership contracts.

1. TJCOG will provide technical assistance in the drafting of any requests for proposals.
- ~~2. TJCOG will assist JLP in evaluating any proposals submitted by consultants.~~
- ~~3. TJCOG will assist JLP in selecting and contracting with a consultant.~~
- ~~4. TJCOG will assist consultants in translating information from the Triangle Region Water Supply Plan into the individual Jordan Lake water supply storage allocation applications.~~
- ~~5. TJCOG will provide consultants with Model outputs and analyses to incorporate as necessary into the individual Jordan Lake water supply storage allocation applications.~~
- ~~6. TJCOG will assist consultants in evaluating Model results.~~

### **Task 4. Assist DWR in revising the Cape Fear River Basin Water Supply Plan and updating the Cape Fear River Basin Hydrologic Model**

TJCOG will coordinate with the Division of Water Resources in its revision of the draft Cape Fear River Basin Water Supply Plan (Basin Plan) to ensure consistency with the Jordan Lake Partnership regional water supply plan. TJCOG will work with the Division of Water Resources and its consultant to ensure updates of the Cape Fear River Basin Hydrologic Model (Model) are consistent with the Jordan Lake Partnership regional water supply plan.

1. TJCOG will coordinate with DWR in their update of the Basin Plan to ensure that the information used for the Basin Plan is consistent with the information used for the JLP regional water supply plan.
2. TJCOG will attend DWR meetings for the Basin Plan as necessary.
3. TJCOG will work with DWR and its consultant to ensure that Model input data are consistent with data in the JLP regional water supply plan.
4. TJCOG will assist DWR and its consultant in obtaining input data from local governments to update the Model.
5. TJCOG will work with DWR and its consultant to ensure that the updated Model meets the needs of the JLP.
6. TJCOG will attend DWR meetings for the Model update as necessary.

### **Task 5. Assist Jordan Lake Partnership in working with DWR and EMC.**

TJCOG will facilitate and provide technical support for meetings between the Jordan Lake Partnership and the Division of Water Resources or the Environmental Management Commission.

1. TJCOG will assist JLP in scheduling meetings with DWR and EMC.
2. TJCOG will assist JLP in preparing for meetings with DWR and EMC.
3. TJCOG will attend meetings between JLP and DWR or EMC to provide technical support.

### ***Task 6. Assisted Jordan Lake Partnership and Fountainworks in Preparing and Presenting Information about the Regional Water Supply Plan.***

*There were several occasions when the JLP and the Regional Water Supply Plan were presented to Regional Municipal and County Managers. TJCOG provided support in preparing graphics and slides for these presentations.*

1. *TJCOG assisted JLP in preparing presentation graphics.*
2. *TJCOG assisted JLP in reviewing and revising PowerPoint slides.*
3. *TJCOG assisted JLP during presentations.*
  - *January 24, 2012 – TJCOG Managers*
  - *April 24, 2012 – Meeting with Bill Holman*
  - *January 28, 2014 – TJCOG Managers*
  - *April 8, 2014 – JLP Managers*

### ***Task 7. Assisted Jordan Lake Partnership members in Working with Western Intake Feasibility Study Consultant.***

*TJCOG provided support to Hazen & Sawyer for the Western Intake Feasibility Study, which included participating in discussions and meetings, sending documentation to H&S, and review of H&S meeting summaries and preliminary alternatives and cost drafts.*

1. *TJCOG assisted JLP in working with Western Intake Feasibility Consultant by providing information and data including regional water demand projections, water supply yields, water needs, anticipated JL allocation requests, monthly demand patterns, future water supply alternatives and implementation options, and draft TRWSP; participating in meetings and discussions; reviewing H&S meeting summaries and alternatives and cost drafts.*
  - a. *Western Intake Meetings*
    - *January 7, 2014*
    - *February 14, 2014*

## **HydroLogics Support**

HydroLogics, Inc. developed the Model. TJCOG may need assistance from HydroLogics for some parts of this project, such as developing specialized operating rules using the OASIS Operation Control Language for a particular Model scenario.

- *The level of support from HydroLogics exceeded the expected level of effort when the scope was initially developed. It was anticipated in the initial scope for HydroLogics to assist in developing specialized operating rules requiring approximately 30 hours. However, HydroLogics support was additionally needed to make changes to the model structure to more accurately represent the systems and future water supply sources for Raleigh, Durham, Orange County and CAMR, and to present the modeling results during a JLP meeting requiring 57 total hours.*

## **Project Management and Administration**

For any contracted project, some amount of time is required to manage the finances of the project, such as accounting for the time that staff members spend on various project tasks, accounting for travel and other expenses, and preparing invoices.

## Budget (Revised May 14, 2014)

Billing will be on a cost-reimbursable basis. Labor will be billed according to the rates in Table 1. Mileage expenses will be reimbursed at the rate of \$0.500 per mile for the foreseeable future. Other expenses will be reimbursed based on actual cost. The total budget for Phase II of the Jordan Lake Partnership Regional Water Supply Study is \$158,530, and details for each task are included in Table 2.

**Table 1. Labor Billing Rates**

Labor Category	Billing Rate
Water Resources Program Manager	\$89.57 per hour, July 1, 2011 – December 31, 2013
Water Resources Planner	\$51.00 per hour, July 1, 2011 – December 31, 2013

**Table 2. Complete Project Budget**

As currently contracted:

Task	WR Program Manager Hours	WR Planner Hours	Total Labor Hours	Budget
Task 1	365	420	785	\$54,115
Task 2	91	360	451	\$26,510
Task 3	24	36	60	\$3,985
Task 4	16	24	40	\$2,655
Task 5	16	16	32	\$2,250
Project Management	12	12	24	\$1,685
HydroLogics Support				\$4,500
<b>Total</b>	524	868	1,392	<b>\$95,700</b>

As revised:

Task	WR Program Manager Hours	WR Planner Hours	Total Labor Hours	Budget
Task 1	610	904	1,514	\$100,745
Task 2	91	480	571	\$32,630
Task 3	16	16	32	\$2,250
Task 4	16	24	40	\$2,655
Task 5	16	16	32	\$2,250
Task 6	40	44	84	\$5,825
Task 7	8	36	44	\$2,550
Project Management	12	12	24	\$1,685
HydroLogics Support				\$7,940
<b>Total</b>	817	1,552	2,369	<b>\$158,530</b>
<b>Difference</b>	285	664	949	<b>\$62,830</b>