Albuquerque Bernalillo County
Water Utility Authority

Agenda Item No. 8d

Meeting Date: March 18, 2015
Staff Contact: Katherine Yuhas, Water Conservation Officer

TITLE: C-15-9 – Approving Intera Water Budget Model Contract Extension

ACTION: Recommend Approval

SUMMARY:
The Water Authority has developed a water budget model for simulation and planning of various supply and demand scenarios, in support of future water planning. This contract extension is for the development and evaluation of alternatives for updating the 2007 adopted Water Resources Management Strategy (Strategy). One of the primary reasons for the water budget model was to utilize and update specific water usage and other information to identify future water needs and allow for evaluating alternatives and to manage the Water Authority's water resources.

A presentation was made to the Customer Advisory Committee (CAC) at the January 2015 meeting to discuss formulation and evaluation of alternatives and the proposed schedule for updating the Strategy. At the presentation, the CAC asked a number of questions related to water supply and demand scenarios including the potential effects from climate variability. These issues will be addressed working closely with the CAC and ultimately all of the alternatives will be presented at public meeting(s) in the fall/winter 2015. We are currently scheduled to meet with the CAC in May, June, July, August and September 2015 and more meetings may be necessary to continue the Strategy work.

The previous contract extension allowed for the Water Authority working with Intera to address and update the model based on feedback from the Scientific Task Force. That work is continuing and we are coordinating to schedule a meeting with the group to finalize the effort and develop a technical memorandum summarizing the process. As a reminder, the Task Force consisted of representatives from the Corps of Engineers, the US Bureau of Reclamation, the New Mexico Interstate Stream Commission, the US Fish and Wildlife Service, and active and retired academic experts from the University of New Mexico.

The Task Force included technical experts from a variety of fields including climate change, systems modeling, surface-water modeling, ground water modeling, habitat management, river management and economics as shown on the following page.

Members of the Task Force include:

- Lori Robertson, US Fish and Wildlife
- Marc Sidlow, US Army Corps of Engineers
- Dennis Garcia, US Army Corps of Engineers
- Lee Brown, H2O Economics (retired UNM)
- Bruce Thomson, University of New Mexico
- Julie Coonrod, University of New Mexico
- Carolyn Donnelly, Bureau of Reclamation
- Nabil Shafike, NM Interstate Stream Commission
- David Gutzler, University of New Mexico

Some of the members of the Task Force will continue to provide support to the Water Authority during the development and evaluation of alternatives. The Task Force has provided very good feedback and having members stay involved will be invaluable to the Water Authority and the public as the updated Strategy is finalized for adoption by the Water Authority Board.

FISCAL IMPACT:
The funding to support this contract extension, in the amount of $295,000, is appropriated for FY 2015 in the Water Resources Management budget.

FIFTH SUPPLEMENTAL AGREEMENT
ALBUQUERQUE BERNALILLO COUNTY
WATER UTILITY AUTHORITY
AND
INTERA, INC.

THIS FIFTH SUPPLEMENTAL AGREEMENT is made and entered into on the date of the last signature entered below by and between the Albuquerque Bernalillo County Water Utility Authority, a New Mexico political subdivision, P.O. Box 568, Albuquerque, NM 87103-0568 (hereinafter referred to as the "Water Authority"), and Intera, Inc., a Texas corporation, with an office at 6000 Uptown Blvd NE, Suite 100, Albuquerque, NM 87110 (hereinafter referred to as the "Contractor").

RECITALS

WHEREAS, the Water Authority and the Contractor entered into an Agreement, dated May 19, 2010, pursuant to the Water Authority's Request for Proposals, RFP2009-027-TC titled "Water Resources Management Strategy", referenced as Exhibit A and Contractor's response to RFP2009-027-TC, dated April 9, 2009, referenced as Exhibit B, as amended by a First Supplemental Agreement, dated July 10, 2012, a Second Supplemental Agreement, dated May 29, 2013, a Third Supplemental Agreement, dated July 1, 2013 and a Fourth Supplemental Agreement dated April 24, 2014, hereinafter referred to as the "Original Agreement", whereby the Contractor agreed to render certain professional services to the Water Authority; and

WHEREAS, the Water Authority has developed a water budget model for simulation and planning of various supply and demand scenarios, in support of future water planning; and

WHEREAS, the Water Authority authorized subsequent detailed studies performed to identify and characterize all existing and potential sources of supply for the Water Authority (CH2M Hill, 2010a), as well as to characterize customer population dynamics and other elements of system demand (CH2M Hill, 2010b); and

WHEREAS, the Contractor delivered a version of the model to the Water Authority in January of 2012, and model training was provided, then subjected to extensive internal testing by the modeling team working together on the model for approximately four years; and

WHEREAS, the Contractor solicited feedback and comments from the Task Force that gave rise to numerous improvements and enhancements to the model under a previous scope of work; and

WHEREAS, the Water Authority wishes to expand the Scope of Services to include the recommended improvements and enhancements based up the feedback from the Task Force; and

WHEREAS, the Water Authority has determined that services are needed for an additional one (1) year period; and

WHEREAS, the Water Authority wishes to increase the compensation amount to pay for the extended Services recommended by the Task Force; and

WHEREAS, the Contractor is agreeable to the additional one (1) year extension to the Original Agreement, the extension of Services and the increase in compensation.

NOW, THEREFORE, in consideration of the premises and mutual obligations herein, the parties hereto do mutually agree as follows:

1. Section 1 of the Original Agreement is hereby amended to include the following Additional Tasks set forth in Exhibit F, Scope of Services, which is attached hereto and incorporated herein as part of the Original Agreement.

2. Section 2 of the Original Agreement is hereby amended to read as follows:

> **Time of Performance.** Services of the Contractor shall commence on May 17, 2010, and shall be undertaken and completed in such sequence as to assure their expeditious completion in light of the purposes of this Agreement; provided, however, that in any event, all of the Services required hereunder shall be completed by June 30, 2016.

3. Section 3A of the Original Agreement is hereby amended to read as follows:

> **Compensation.** For performing the Services specified in Section 1 hereof, the Water Authority agrees to pay the Contractor up to the amount of **One Million Forty-Nine Thousand One Hundred Fifty-Four and 00/100 Dollars ($1,049,154.00),** which amount includes any applicable gross receipts taxes and which amount shall constitute full and complete compensation for the Contractor's Services under this Agreement, including all expenditures made and expenses incurred by the Contractor in performing such Services.

4. Exhibit C, Project Budget, of the Original Agreement is hereby amended to include the amount of **Two Hundred Ninety-Five Thousand Two Hundred Ninety and 00/100 Dollars ($295,290.00),** to be paid in accordance with Exhibit F – Cost Summary which is attached hereto and incorporated as part of this Agreement.

5. Except as herein expressly amended, the terms and conditions of the Original Agreement shall remain unchanged and shall continue in full force and effect unless there is a conflict between the terms and conditions of the Original Agreement and this Fifth Supplemental Agreement, in which event, the terms and conditions of this Fifth Supplemental Agreement shall control.

6. This Agreement shall not become effective or binding until approved by the Water Authority's Executive Director.

IN WITNESS WHEREOF, the Water Authority and the Contractor have executed this Fifth Supplemental Agreement as of the date of the last signature entered below.

ALBUQUERQUE BERNALILLO COUNTY WATER UTILITY AUTHORITY

Approved By:

_____
Mark S. Sanchez, Executive Director

Date: _____

_____
John M. Stomp III, P.E.
Chief Operating Officer

Date:_____

Reviewed by:

_____
Charles W. Kolberg, General Counsel

Date: _____

CONTRACTOR: INTERA, INC.

By: _____

Print: _____

Title: _____

Date: _____

State Taxation and Revenue Department
Taxpayer Identification No.:
02-480923-00-3

Federal Taxpayer Identification No.
743010638

EXHIBIT F

Scope of Services

Introduction

The Water Authority has developed a water budget model for simulation and planning of various supply and demand scenarios, in support of future water planning. The first phase of the project consisted of code selection, identification of primary existing and potential elements for both supply and demand, and model construction. Based on a code evaluation and ranking process, the GoldSim software platform was selected as the appropriate modeling platform for this application (INTERA and CH2M Hill, 2010). Subsequent detailed studies were performed to identify and characterize all existing and potential sources of supply for the Water Authority (CH2M Hill, 2010a), as well as to characterize customer population dynamics and other elements of system demand (CH2M Hill, 2010b). The model was developed based on these elements by the modeling team, which consisted of INTERA, its subcontractor CH2MHill, and key Water Authority staff. Development proceeded in an interactive fashion (often called agile development), comprised of multiple design sessions with Water Authority staff to determine how the model graphical user interface (GUI) should look and feel, and what specific functions the model should embody. The beta version of the model was delivered to the Water Authority in January of 2012, model training was provided, and the model was then subjected to extensive internal testing by the modeling team. The current team is well-established and been working together on the model for approximately four years.

Subsequent to testing by the modeling development team, the Water Authority convened a Scientific Task Force (Task Force) to review and evaluate the model. The Task Force consisted of representatives from the Corps of Engineers, the US Bureau of Reclamation, the New Mexico Interstate Stream Commission, the US Fish and Wildlife Service, and active and retired academic experts from the University of New Mexico. The Task Force included technical experts from a variety of fields including climate change, systems modeling, surface-water modeling, groundwater modeling, habitat management, river management, and economics.

Feedback and comments from the Task Force gave rise to numerous improvements and enhancements to the model under a previous scope of work, including:

- Simulation of additional outdoor watering should temperatures increase as a results of climate change;
- Import of Upper Rio Grande Operations Model (URGWOM) daily river operations data for real-time and historical accounting;
- Implementation of a historical accounting module to store and evaluate historical system data, which can be constantly updated;
- Implementation of a reporting module to automate the process of monthly reporting to NM OSE;
- Full link to the NM OSE MODFLOW model for simulation of groundwater pumping impacts;
- Implementation of an economic module to allow for cost-based comparison of alternatives;

- Full implementation of predicted potential climate-change impacts as presented in the 2013 US Bureau of Reclamation Upper Rio Grande Impact Assessment (URGIA);
- Update of the previous 1971 – 1998 surface-water time-series input data to the 2013 (to be updated to 2014 by CH2M Hill) ; and
- Implementation of functionality to allow further flexibility with surface-water time-series input data.

With these updates and enhancements, the model is now ready to use in Beta form for scenario development and ranking in support of the Water Authority's update to the 2017 Water Resources Management Strategy (WRMS). The key to a successful update to the WRMS will be to develop scenarios and supply portfolios that are sustainable and resilient, even in the face of potential future impacts such as climate variability, population and demographic changes, and other possibilities.

The following Tasks represent our proposed approach to supporting the Water Authority to successfully develop, design, evaluate, and communicate its 2017 WRMS strategy.

Task 1. Task Force Fulfillment

While the Task Force has provided excellent input and the Project Team has responded to nearly all of their comments and questions, there remains at least one final meeting to close out the process and get any final feedback from the Task Force. In addition, INTERA will provide a Technical Memorandum to the Water Authority summarizing the Task Force review process, including all meeting minutes, feedback received, and response to that feedback. Thus we will develop a formal document for the administrative record showing that the model has been peer-reviewed and generally accepted by the local community of water managers and experts. This will lend needed credence to the model and its use for the scenario-development process.

Deliverables

1. **Facilitation of up to two final meetings with Task Force, including agenda, meeting space, presentation materials, and meeting minutes**
2. **Draft Technical Memorandum on the peer-review process performed by the Task Force**
3. **Address one round of comments**
4. **Final Technical Memorandum**

Task 2. Scenario Development

The scenario development process will begin with a presentation to the Water Authority Customer Advisory Committee (CAC) in mid-January. This presentation will frame the issues associated with scenario development and the proposed process for evaluating and ranking the scenarios comparatively using the water budget model.

The next phase of scenario development will include detailed evaluation of potential demand futures and potential supply portfolios. This phase of the project will include extensive coordination with the technical team including revising the Value of Water Study (primarily to determine the nature of the Drought Reserve) and the Engineering Team who will be providing detailed input for each of the demand and supply portfolio alternatives.

While the primary initial development and screening of supply portfolios and scenarios will be performed by the Engineering Team, there is a need for INTERA, in its role in interfacing with the CAC and ultimately the public at large, to have a deep understanding of all of the scenarios, and thus there will be a need for our involvement in running the scenarios themselves.

In addition, INTERA will be responsible for economic analyses associated with scenario development. The economic analysis will include developing a distinct series of annual costs for each of the alternative supply portfolios and scenarios in the water budget model. The distinct series of costs will allow for an economic analysis of the relative costs for each of the alternative supply scenarios and current practice. In order for INTERA to develop distinct series of annual costs for each alternative supply portfolio and scenario, INTERA will need to be fully involved in the development and running of the scenarios.

INTERA will also be responsible for the physical production of the final version of the Value of Water document on behalf of Dr. Lee Brown.

Deliverables

1. **Coordinate with the Engineering Team and the Value of Water team in development of the Drought Reserve**
2. **Coordinate with the Engineering Team to develop, screen, vet, and run up to 20 scenarios**
3. **Perform economic analyses on up to 20 scenarios**
4. **Attend up to 6 (six) meetings of the full Project Team (Water Authority staff, Engineering Team, Value of Water Team) for the purpose of scenario development and screening**
5. **Production of the final version of the Value of Water report on behalf of Dr. Lee Brown**

Task 3. Customer Advisory Committee Support

Working with the Water Authority Customer Advisory Committee (CAC), the Project Team will develop and vet a variety of scenarios and supply portfolios. This will be the initial phase of scenario development that will occur before the Water Authority engages the public at large in the WRMS update process. The intent of this initial phase is to distill an initial (potentially large) universe of scenarios and supply portfolios into a tractable number of scenarios that can then be evaluated by the public at large.

This task will include presentations and engagement with the CAC through as late as August 2015, and may include development of presentations to be given by Water Authority staff or other members of the Project Team, engagement to the extent necessary with members of the CAC to facilitate their understanding of various scenarios and supply portfolios.

Deliverables

1. **Development of presentation materials for up to four (4) CAC meetings (May, June, July, August)**
2. **General support for CAC members to support their understanding of scenario development and ranking**

Task 4. Decision Analysis and Preliminary Rankings of Alternatives

Once a set of scenarios has been developed, they will be preliminarily ranked. The focus of this Task will be to (1) develop a ranking scheme acceptable to the CAC and Water Authority Staff and (2) make an initial application of that ranking scheme to the scenarios developed under previous tasks. Some potential ranking criteria are:

- Environmental Protection
- Implementability
- Legal and Administrative Feasibility
- Sustainability and Resiliency
- Quality of Life
- Financial Support (Cost)

Some of the more subjective components, such as legal considerations, stakeholder acceptance, and environmental impacts are more qualitative in nature, and cannot be evaluated only with the water budget model. While these components are not easily simulated in a systematic manner, they are important with respect to decision making. Nevertheless, we will develop key decision criteria, assign weights to these criteria, populate the criteria, and assess results. In this way these more subjective components will be considered.

To rank the scenarios, we will develop a multi-criteria Decision Analysis (or other appropriate) framework within which the scenarios will be ranked. The Decision Analysis framework will be developed in conjunction with Water Authority staff and will be based on scoring and ranking scenarios based on metrics such as those listed above. The scenarios will initially be ranked internally by the modeling team, then ranking will be presented to the CAC for comment and input.

The Decision Analysis framework and preliminary ranking will be presented to the CAC for their review and comment. The decision criteria may be modified based on input from the CAC, and additional preliminary ranking may occur based on their input.

Deliverables

1. **Development of a Decision Analysis framework, including key criteria**
2. **Technical Memorandum detailing the Decision Analysis framework**
3. **Preliminary application of the Decision Analysis framework**
4. **Presentation of the results to the CAC**
5. **Up to two (2) subsequent iterations with the CAC to modify the Decision Analysis framework**

Task 5. Development of Preliminary/Updated Water Resources Policies

The WRMS policies from 2007 will be updated. Revised policies for 2017 will be driven by specific needs as identified by the scenarios and proposed supply portfolios. Each policy will be developed to address a specific need that has been identified during the scenario development process. For example, if a specific source of supply is not currently available because of present-day administrative or legal constraints, then a policy will be developed that will provide a

roadmap for the Water Authority to facilitate the necessary changes to access that source of supply. In addition, revised policies may be updated based on identified economic advantages of a specific alternative supply scenario. The water budget and economic analysis may also identify a particular long-term water supply acquisition plan that can be developed into a new policy and corresponding recommendations for the Water Authority to implement. In this manner, the policies that will be developed will provide a strategy for the Water Authority to meet its goal of providing a sustainable and resilient supply to its stakeholders.

Deliverables

1. **Policy development and screening with the Water Authority staff, Engineering Team, Value of Water Team, and the CAC**
2. **Draft Proposed Policy Document**
3. **Address one round of comments**
4. **Final Proposed Policy Document**

References:

CH2M Hill, 2010a. Task 2: Water Supply Scenarios. Technical Memorandum to INTERA dated December 21, 2010.

CH2M Hill, 2010b. Task 3: Water Demand Scenarios. Technical Memorandum to INTERA dated February 24, 2011.

INTERA and CH2M Hill, 2010. Task 1 Model Selection. Technical Memorandum submitted to the Albuquerque Bernalillo County Water Utility Authority. October 5, 2010.

EXHIBIT F

Cost Summary

Task	**Cost**
Task 1. Task Force Fulfillment	$9,436
Task 2. Scenario Development	$125,640
Task 3. Customer Advisory Committee Support	$28,960
Task 4. Decision Analysis and Preliminary Rankings of Alternatives	$60,680
Task 5. Development of Preliminary/Updated Water Resources Policies	$51,256
Subtotal	$275,972
NMGRT (7%)	$19,318
Total	**$295,290**