

BOARD OF PUBLIC UTILITIES

ADDITIONAL MEETING DOCUMENTS

Additional or revised information or documents are often passed out to the Board at the meetings. Whenever possible, this informational cover page will accompany those documents.

MAKE 20 COPIES OF ANY DOCUMENTS, INCLUDING THIS COVER SHEET, AND RETURN TO JAIME KEPHART PRIOR TO THE MEETING.

MEETING DATE	10/19/2016
AGENDA ITEM	5.C. Approval of Task Order No. 1 Under Services Agreement No. AGR16-055 with AUI, Inc.
DOCUMENT TITLE(S)	(REVISED) Task Order No. 1 to AGR16-055
FROM	James Alarid
NEW OR REVISED? Is this a revision that is different than what was in the agenda packet or is it something entirely new?	REVISED
RECOMMENDED ACTION If you have a new or revised recommended motion for the Board, enter it here.	<u>REVISED CONSENT MOTION:</u> <i>I move that the Board of Public Utilities approve the items on the Consent Agenda as amended, which includes the revised Task Order No. 1 for Services Agreement No. AGR16-055 with AUI, Inc., that was presented to the Board at this meeting and shall be made part of the record, and that the motions in the staff reports be included in the minutes for the record.</i>
ADDITIONAL INFORMATION Please VERY BRIEFLY explain the purpose of this information or document.	<p>The bid items listed in the task order provided to the Board in the published agenda packet were numbered incorrectly. They have been corrected to accurately reflect the numbering shown in the previously approved agreement AGR16-055. None of the other information in the task order has changed.</p> <p>Because no dollar amounts have changed the motion in the agenda packet for this particular item remains the same. However, the consent motion needs to be revised to reflect that what the Board is approving as part of the Consent Agenda is different than what was published in the agenda packet.</p>

TASK ORDER #01

**COUNTY OF LOS ALAMOS UTILITIES DEPARTMENT
PRICE AGREEMENT AGR 16-055**

**AUI Inc.
October 3, 2016**

PROJECT TITLE: Wastewater Collection System's Trenchless Repair Replacement and Rehabilitation

Description: The contractor shall provide services for complete or partial replacement and rehabilitation of sanitary wastewater collection system's ("SAS") segments, identified by the county, using approved trenchless technologies.

Estimated Project Term: 60 Calendar Days

1. Bid Item 01: Mobilization 1 LS @ \$25,000.00 / LS = \$25,000.00
2. Bid Item 02: Demobilization..... 1 LS @ \$7,500.00 / LS = \$7,500.00
3. Bid Item 04: Clean Water Act Compliance as Applicable,
Including Best Practices per Site..... 4 EA @ \$555.00 / EA = \$ 2,220.00
4. Bid Item 07: Traffic Control..... 42 Days @ \$684.00 / Day = \$28,728.00
5. Bid Item 08: Furnish and Install 8" Diameter SAS
using owner approved Spiral Wound
Trenchless Technologies..... 1,432 LF @ \$120.00 / LF = \$ 171,840.00
6. Bid Item 22: 4" Dia. SAS Service Line Installation
and Reconnection by Trenchless Technology, Up to 40 ft Long,
Clean-out, Regardless of Depth..... 1,300 FT @ \$103.00 / LF = \$ 133,900.00
7. Bid Item 23: Supply and Install 4" Clean-out in Existing SAS Service Line,
Including Fittings, Up to 8' in Depth..... 85 EA @ \$1,340.00 / EA = \$113,900.00
8. Bid Item 27: Landscape Restoration..... 1-Allowance @ \$10,000.00 / ALL = \$10,000.00
9. Bid Item 28: Specification Compliance Testing..... 1-Allowance @ \$5,000.00 / ALL = \$5,000.00

Estimated Construction Cost: \$ 498,088.00 (less GRT)

Charge Code Number _____

Acceptance of Conditions and Items of Work

Department of Public Utilities: _____

Timothy A. Glasco, PE

Date

AUI Inc.:



Michael Roeco, CPE

10/18/16

Date

BOARD OF PUBLIC UTILITIES

ADDITIONAL MEETING DOCUMENTS

Additional or revised information or documents are often passed out to the Board at the meetings. Whenever possible, this informational cover page will accompany those documents.

MAKE 20 COPIES OF ANY DOCUMENTS, INCLUDING THIS COVER SHEET, AND RETURN TO JAIME KEPHART PRIOR TO THE MEETING.

MEETING DATE	10/19/2016
AGENDA ITEM	6.A. Approval of Services Agreement No. AGR17-10 with Siemens Industry, Inc
DOCUMENT TITLE(S)	1. Revised Staff Report 2. AGR17-10
FROM	Steve Cummins
NEW OR REVISED? Is this a revision that is different than what was in the agenda packet or is it something entirely new?	REVISED & NEW
RECOMMENDED ACTION If you have a new or revised recommended motion for the Board, enter it here.	<u>REVISED MOTION:</u> I move that the Board of Public Utilities approve Services Agreement No. AGR17-10 with Siemens Industry, Inc., in a form acceptable to the County Attorney, in the amount of \$332,100.00, plus applicable gross receipts tax, for the purpose of Development of an Integrated Resource Plan. I further move that the Board of Public Utilities approve the related Budget Revision No. 2017-08 in the amount of \$132,100.00 and forward both to Council for approval.
ADDITIONAL INFORMATION Please VERY BRIEFLY explain the purpose of this information or document.	REVISED STAFF REPORT: The total amount of compensation in the agreement is \$332,100.00. In the published staff report, the amount of compensation was shown as \$311,100.00 with an additional contingency of \$21,100.00. The total amount being approved has not changed; however, the contingency shown in the original staff report is actually part of the overall compensation specified in the agreement. AGR17-10: At the time of agenda publication, the agreement was still in legal review and was not included in the packet. It is included here.

REVISED STAFF REPORT FOR ITEM 6.A, OCTOBER 19, 2016 BPU MEETING

..Title

Approval of Services Agreement No. AGR17-10 with Siemens Industry, Inc. in the amount of ~~\$311,000.00~~ **\$332,100.00**, plus Applicable Gross Receipts Tax, for the Purpose of Developing an Integrated Resource Plan and Approval of Related Budget Revision 2017-08

..Recommended Action

I move that the Board of Public Utilities approve Services Agreement No. AGR17-10 with Siemens Industry, Inc., in a form acceptable to the County Attorney, in the amount of ~~\$311,000.00 and a contingency in the amount of \$21,100.00, for a total of \$332,100.00~~, plus applicable gross receipts tax, for the purpose of Development of an Integrated Resource Plan. I further move that the Board of Public Utilities approve the related Budget Revision No. 2017-08 in the amount of \$132,100.00 and forward both to Council for approval.

..Staff Recommendation

Staff recommends approval of the motion as presented.

..Body

The County has partnered with DOE-LANL through the Electric Coordination Agreement (ECA) since 1985 to meet the electrical power needs of both parties. The current ECA expires June 30, 2025. This partnership is often referred to as the Los Alamos Power Pool (LAPP). Since 1985 the LAPP has developed and maintained a Power Supply Study, commonly referred to as an integrated resource plan, for planning purposes.

An integrated resource plan, or IRP, is a utility plan for meeting forecasted annual peak and energy demand, plus some established reserve margin, through a combination of supply-side and demand-side resources over a specified future period. IRPs compare the Levelized Cost of Electricity (LCOE) for generation resource options while also considering utility specific goals and objectives in the planning process.

While both Los Alamos County and Los Alamos National Laboratory believe it is beneficial to continue the ECA post 2025, a change in philosophy on generating assets will likely affect future agreements. Today, LANL and the County have different goals and objective to meet their current and forecasted energy demands. Each party is considering different replacement resources, either through owning generation assets or through power purchase agreements. In addition the County and DOE-LANL have different targets for reducing greenhouse gas emissions, particularly carbon dioxide emissions.

During the first quarter of 2016 the Board of Public Utilities adopted a Strategic Policy for Electrical Energy Resources and Distributed Energy Resources (DER) to meet our goal of being carbon neutral electrical energy provider by 2040. See Attachment C.

Because of the change in philosophy, DPU staff is recommending that the County have a new IRP developed with two primary objectives;

First, help guide near-term decisions under the requirements of the current ECA between LAC and DOE-LANL, while also recommending various options for a post 2025 ECA that may be beneficial to both parties.

Second, help guide near-term and long-term decisions in multiple areas as DPU implements the policies adopted by the Board of Public Utilities. The IRP will evaluate a comprehensive range of demand-side and supply-side resources over the period 2017-2036.

Currently DPU is evaluating our further participation through the Utah Association of Municipal Power Systems (UAMPS) in the Carbon Free Power Project (CFPP) developing a 600 megawatt capacity small modular reactor nuclear power plant. DPU is also faced with a decision on continued participation in the San Juan Generating Station post 2022. The IRP will assist DPU staff, Board and Council in making these decisions by looking at all of the options available to the County for meeting our electric demands while considering DPU's strategic initiatives. The IRP will compare options based on cost, stability and environmental stewardship.

A draft of the IRP is scheduled to be completed by March 1, 2017. DPU staff also plans on making a recommendation to the Utilities Board in March or April of 2017 on participation in Phase 2, Site Characterization, of the CFPP.

This contract will allow staff at their discretion to have the contractor provide an update of the IRP 18 to 24 months after its completion in 2017. The update will coincide with two critical decision points related to the San Juan Generating Station and further development of the CFPP using the most current information available at that time (i.e. cost of fuel, changes in environmental regulation and changes in technology options available). Should staff request this update, the cost is already included in the overall contract amount of ~~\$311,000~~ \$332,000.00 and will not exceed \$100,000.

The development of the IRP will greatly assist staff in navigating the multitude of options available to the County for meeting their electrical energy resource needs while considering BPU's strategic initiatives.

..Alternatives

If the board chooses not to approve this contract, DPU staff will need to rely on other methods of comparing generation resource options while considering the Strategic policies adopted by the board. The information used may be current but staff will not have the ability to change the variables to see what the cost of the alternatives may be over the planning period.

..Fiscal and Staff Impact

This study was budgeted at \$200,000 in the FY2017 budget. A budget adjustment of \$132,100.00 is required.

..Attachments

At the time of agenda publication, AGR17-10 was still pending legal review and was not yet ready. A hard-copy will be provided to the Board at the meeting.

A - Budget Revision 2017-08

B - Strategic Policies for Energy Resources



AGR17-10

INCORPORATED COUNTY OF LOS ALAMOS SERVICES AGREEMENT

This **SERVICES AGREEMENT** (this "Agreement") is entered into by and between the **Incorporated County of Los Alamos**, an incorporated county of the State of New Mexico ("County"), and **Siemens Industry, Inc., (for its Pace Global business)**, a Delaware corporation ("Contractor"), to be effective for all purposes October 31, 2016.

WHEREAS, the County Purchasing Agent determined in writing that the use of competitive sealed bidding was either not practical or not advantageous to County for procurement of the Services and County issued Request for Proposals No. 17-10 (the "RFP") on August 28, 2016, requesting proposals for Development of an Integrated Resource Plan ("IRP") to guide the Department of Public Utilities in its decision making process in the acquisition of new power generation resources, as described in the RFP; and

WHEREAS, Contractor timely responded to the RFP by submitting a response dated September 27, 2016 ("Contractor's Response"); and

WHEREAS, based on the evaluation factors set out in the RFP, Contractor was the successful Offeror for the services listed in the RFP; and

WHEREAS, the Los Alamos County Board of Public Utilities approved this Agreement at a public meeting held on October 19, 2016; and

WHEREAS, the County Council approved this Agreement at a public meeting held on October 25, 2016; and

WHEREAS, Contractor will provide the Services, as described below, to County.

NOW, THEREFORE, for and in consideration of the premises and the covenants contained herein, County and Contractor agree as follows:

1. **SECTION A. SERVICES:** Contractor shall provide an IRP that will help guide near-term decisions under the requirements of the current Electric Coordination Agreement between County and Department of Energy-Los Alamos National Laboratory ("DOE-LANL") and will help guide near-term and long-term decisions in multiple areas as County implements the policies adopted by the Board of Public Utilities ("BPU"). Contractor shall format the IRP so it can be easily updated over time to reflect changing circumstances. The IRP will evaluate a comprehensive range of demand-side and supply-side resources over the period 2017-2036. Contractor shall address the following key questions in this IRP:
 - a. How can County and DOE-DOE-LANL best share resources for the benefit of both parties with a post 2025 Energy Coordinating Agreement ("ECA")?
 - b. What is the best portfolio of resources to meet County's goal of being carbon neutral by 2040?

- c. When should County terminate its current ownership in the coal-fired San Juan Power Project in New Mexico? The current project participation agreement expires in 2022.
- d. Is there any opportunity to sell the County's share of Unit 4 at the San Juan Generating Station and if so when and how this best would be solicited?
- e. Should County continue its participation in the Utah Association of Municipal Power Systems ("UAMPS") Carbon Free Power Project ("CFPP") using a series of small modular reactors, currently in phase I (fatal flaw analysis)?
- f. How can County secure transmission for the CFPP with all of the movement and discussions around a combined Independent System Operator ("ISO")?
- g. What are the possible options for County to meet the policies established by the adopted County's Future Energy Resource ("FER") committee recommendations?
- h. What additional opportunities exist for cost-effective demand-side programs, including energy efficiency, demand response, and distributed energy storage?
- i. How should County cost-effectively meet the requirements for reliable and economic operations inside the Balancing Area of the Public Service Company of New Mexico ("PNM")?
- j. If possible, when is the most economical time to exit the Laramie River Station Power Purchase Agreement ("PPA")?

Phase I: Initiation of the IRP Process

In this first phase of work, conducted in a Kick-Off Meeting, Contractor shall accomplish the following:

1. Gather information and data. Before the Kick-Off Meeting, Contractor will prepare a data request and gather input data to include, but not limited to, load forecasts, existing resource characteristics, take or pay gas and coal supply contracts, power purchase agreements, and fuel forecasts. Contractor will use its own market forecasts for the purpose of this study. Contractor will use these inputs to develop a spreadsheet that will summarize all of the key assumptions that will drive these forecasts. For these analyses, Contractor will model the Los Alamos area in sufficient detail to account for the likelihood of changes to the current economic conditions, and potential coal retirements on the County's generation needs, as well as on the surrounding regions at a high level.
2. Set protocols and Project Management meetings. At the Kick-Off Meeting, Contractor will establish coordination protocols throughout the IRP planning process and set a bi-weekly schedule for reporting progress to County and getting County's feedback at every step of the process. Contractor will ensure that County is well informed throughout the process and has input into every decision.
3. Establish Objectives and Metrics. Contractor will discuss the primary goals and objectives and key metrics that will be used to evaluate the recommended portfolio(s). Contractor shall consider County's primary objectives which include identifying a portfolio that is lowest cost, minimizes risks or stable rates, ensures reliability, meets environmental stewardship standards and provides for needed diversity or flexibility as markets evolve but must also consider the County's goal of being carbon neutral by 2040. Hence, Contractor will establish metrics for each objective at the beginning of the process so it can properly evaluate all reasonable alternatives against these sometimes competing metrics. There can be multiple metrics for each objective as County determines is appropriate.

Phase II: Post 2025 Assessment

During Phase II Contractor shall review the ECA between DOE-LANL and County that expires in 2025. Contractor will address the options of flexibility between DOE-LANL and County to select different assets to meet each of their respective objectives.

To address the post 2025 extension of the existing ECA, Contractor will select a limited number of options, and conduct an analysis of the implications of those contractual options in the post 2025 period on the portfolios selected to assess the costs of optimizing County's and DOE-LANL's requirements separately rather than jointly.

To fully vet this process, Contractor will review with County the ECA and the alternatives and objectives of both parties. As 80% or more of County's load, DOE-LANL is a key participant and has many common objectives with County. However, as a national lab, not all objectives are likely to be totally aligned and both DOE-LANL and County are considering adding flexibility to allow both parties to meet their objectives somewhat independently.

Contractor will reach an agreement with County on which options are most relevant and then evaluate the impact of one or more of these options and compare it to the existing ECA framework (business as usual). Included in the Core Initial Study, Contractor shall meet with County and DOE-LANL at a mutually agreeable time to discuss the goals and objectives of both parties. With this information, Contractor will analyze the implications of the options on the ultimate cost under selected portfolios.

Contractor will select portfolios that would (i) meet both group's objectives and constraints as if they continued to operate under the existing ECA structure; (ii) what might change if they both operated independently (and compare the cost implications); and (iii) select one of the options that gave DOE-LANL somewhat more flexibility than the first but less than the second.

The Contractor will set up two sets of objectives (one for DOE-LANL and one for County) – then select portfolios based upon maximizing value under different contractual assumptions and then test to see the cost implications of each over different future market outcomes.

Phase III: Conducting the IRP

Contractor will draft the IRP in a way that focuses on two (2) distinct periods, with the first focused on decisions between 2016 and 2025 and the second focused on the 2026-2036 period, to guide near-term and long-term decisions. In the first period, the assessment will be based on the joint interests of the current contract with DOE-LANL under a current set of objectives. In the second period, Contractor will consider evaluating resources based upon the most likely construction of the contractual arrangement with DOE-LANL in the post-2025 period from the analysis conducted in Phase II. The County will make a decision after considering DOE-LANL's input on the best approach for contracting with DOE-LANL in the post-2025 period, Contractor will follow the task methodology, described below, for completing the IRP:

Task 1: Develop Baseline and Scenario-based Screening Forecasts

For screening technologies and selecting portfolios, Contractor will provide a baseline forecast of plant operating data, PPA performance and baseline forecasts of coal, gas, power and emission forecasts. In addition, Contractor will select a couple of boundary scenarios to test technology options against, to ensure that options are not eliminated without proper consideration of their merits under different market conditions as described below.

Baseline Load Forecast Modeling and Analysis Overview

Contractor will develop County load forecasts as outlined below:

- Step 1:** Contractor shall collect updated historical load, weather, and economic data (Gross Domestic Product (“GDP”), personal income, population, and other relevant information in a separate Excel file)
- Step 2:** Contractor shall update the regression model comparing more recent weather and economic factors to load
- Step 3:** Contractor shall project future weather conditions and economic variables based largely on updated historical indicators
- Step 4:** Contractor shall model load based on weather and economic projections in Step 3 to develop the “base case” load forecast
- Step 5:** Contractor shall develop scenarios that will alter the macro load growth parameters and the economic variables from Step 3 that could impact the forecast.

Baseline and Alternative Scenarios for Coal, Gas, Emissions, Technologies and Power

Contractor will provide its baseline, high and low forecasts for the following key variables over the planning horizon:

1. Natural gas markets (demand and prices at both Henry Hub and basis to select points);
2. Coal markets and prices, including coal transportation;
3. Oil prices for specified products at major shipping points if needed;
4. Emission prices (Carbon, SO₂, NO_x) and emissions;
5. Technology capital costs for a specified group of technologies;
6. Power prices (peak and off-peak);
7. Plant retirements and builds; and
8. Electricity demand by class.

Contractor shall remain flexible on the development of some or all of these variables for its Baseline forecast values. Contractor will construct the sensitivities around the Baseline forecast.

Contractor will in its analysis, assess at a high level what, if any, impacts the Regional Transmission Operator (RTO) options in the region have on potential investments in the UAMPs proposal on modular nuclear or other transmission needs for new generation outside New Mexico. To the extent that costs may differ, Contractor will suggest the most likely treatment of transmission for purposes of this study and note any concerns that would impact whether to continue to invest in that project.

Task 2: Technology Option Screening and Portfolio Development

To define the options for additional resource additions, Contractor will deploy a screening analysis to rank different technologies and combinations of these technologies in the short, medium and long term to meet a number of key requirements, such as reserve margins or required environmental restrictions (such as Carbon free by 2040). This task will provide guidance to the County on the preferred timing and feasible technology choices before performing the full portfolio analysis.

Next, using the technology specifications (such as capital costs, heat rate and capacity adjusted for local characteristics including elevation, etc.) identified, Contractor will work with County to identify portfolio specifications that will include technology choice, size, and timing of the resource addition. These portfolio specifications will be diverse enough to evaluate all of the key questions identified above, but focused enough to represent a full range of plausible

options. Contractor shall evaluate, at minimum, the following portfolio options alone or in combination:

1. A reference case resource plan, which will assume no new builds or retirements; this plan will provide a frame of reference for each of the other portfolio options
2. Continuation of Laramie River (terminate PPA soon, keep for intermediate term, or keep indefinitely)
3. Continuation of the UAMPs nuclear option
4. A new combined-cycle power plant (on or after 2022)
5. The purchase of certain ownership shares an existing combined cycle power plant
6. Extension of Participation Agreement in the San Juan coal plant to 2027 or 2035
7. The purchase of capacity and energy from the market
8. Long-term Power Purchase Agreement of renewables (wind or solar)
9. Build renewables (solar or wind – utility scale – community solar)
10. DER penetration, energy efficiency and DSM options
11. A combination of small reciprocating engines
12. Battery storage
13. Combinations of the above options

Contractor will collaborate with County to screen and rank the technology options at different points in time under a limited number of screening scenarios (described in the previous task) to construct a total of six (6) portfolios for further evaluation of the overall risks and tradeoffs to sufficiently address County's primary objectives in managing rate and system stability, costs, market exposure, as well as environmental compliance and stewardship. The existing take-or-pay gas and coal contracts, and the PPA will be considered and modeled in the portfolio analysis.

Task 3: Portfolio Resource Plan Analysis

Contractor and County will collaborate to determine the risk factors that will be evaluated for the purpose of the IRP. Contractor will then propose that stochastic distributions, based on both historic volatility and expected impacts of specific anticipated events, be developed to capture uncertainty of the market drivers including:

1. The expected trajectories and distributions of peak and average loads for Western Electricity Coordinating Council (WECC), New Mexico, and DOE-LANL, taking into consideration different plausible scenarios of energy efficiency penetration and transportation electrification.
2. The expected trajectory and distribution of natural gas prices at delivery points throughout WECC, considering expected evolution of the natural gas transportation infrastructure, and non-power industry factors driving supply and demand such as Liquefied Natural Gas (LNG) exports.
3. Coal Prices, considering fundamental economics of mining, and effect of commodity prices on transportation cost of coal from mine mouth to plant sites
4. Generation Technology Capital costs, reflecting expectation of prices of commodity utilized in the manufacture and installation of the technology, the decline curves for each technology associated with benefit of R&D and technological maturity, and uncertainties around the speed of technological change and the costs of building plants.
5. CO2 prices, considering differing scenarios of environmental legislation as well market design and market forces affecting cost of compliance.

Contractor will use these stochastic drivers to create up to two hundred (200) iterations representing plausible market condition that captures range of variability and the serial

correlation within each one of these market drivers, as well as the cross correlation between different market drivers.

Next, using AURORA_{xmp}, Contractor will run these 200 iterations over time and determine how each plant in each portfolio dispatches to meet load, the costs associated with meeting load and will track emissions to ensure that they meet regulatory requirements. Contractor will summarize how well each portfolio performs against the selected metrics.

County's selection of the "recommended" portfolio will balance County's needs for the least amount of expected costs and the most stable portfolio among other competing objectives, among other objectives.

Using this approach, Contractor will more rigorously assess tradeoffs between:

1. Least cost and rate stability;
2. Least cost and environmental stewardship; and
3. Least cost and most diversity.

Phase IV: Provide Presentation-Style Reports at Public Board Meeting

Contractor will present its findings to County in Los Alamos as described below in PowerPoint format (i) at 60 percent completion within 120 days of the Effective Date of this Agreement and (ii) upon completion of the IRP (described below in Phase V). The 60% submittal shall include a preliminary review of the County's resource options considering the adopted policies by the BPU and the current market conditions.

Contractor will present at least two (2) presentations to the BPU. At County's request, Contractor will present at additional public stakeholder meeting(s). This presentation-style report will show the process used, key assumptions, findings, sensitivities and interpretation of results.

Contractor will also develop presentation material with detailed supplementary notes, including charts, graphs, and tables to be submitted to the County for review and comment at least two (2) weeks prior to Contractor's presentations. Contractor will provide the County with the draft information necessary for Contractor to present preliminary results to the BPU to ensure compliance with the adopted strategic objectives.

Phase V: Provide Final Report including Implementation Plans

Contractor along with County staff will consider the Board and Council feedback in the final analysis to prepare a comprehensive IRP report. This final report will address both short-term focusing on the ECA and long-term portfolio combinations that would cover a post 2025 ECA that meets the needs of both parties over a 20-year period (2016-2035). The report will break out the analysis into two (2) distinct periods, the existing contract period through 2025 and the post contract period. Contractor will also specifically address each of the ten (10) Key Issues described in Section A Services, above.

This final report will reflect the approach and the selection process for the recommended portfolio in each period along with full documentation of the steps along the way.

Project Schedule. Contractor shall adhere to the following Project Schedule in the development of the IRP:

November 8 Kick- Off Meeting

November 22 Finalize operating parameters of existing fleet, objectives, metrics and portfolio options

December 7	Complete load forecast and define screening scenarios
January 23	Select Final Portfolios and Develop Stochastic Inputs
February 17	Complete Risk Analyses
February 27	Present preliminary findings (60% within 120 days) and results of initial portfolio analysis for the portfolios, including supporting analysis
March 15	Deliver updated findings and detailed presentation to management or to the BPU
March 21	Deliver final presentation and written IRP report to County for acceptance

Upon mutual agreement, the Project Schedule may be slightly modified, however the final written IRP report shall be delivered to County for acceptance no later than April 1, 2017.

SECTION B. TERM: The term of this Agreement shall commence October 31, 2016 and shall continue through November 1, 2018, unless sooner terminated, as provided herein. At County's sole option the Agreement may be renewed for up to three (3) consecutive one-year periods, unless sooner terminated, as provided therein.

SECTION C. COMPENSATION:

- 1. Amount of Compensation.** County shall pay compensation for performance of the Services in an amount not to exceed THREE HUNDRED THIRTY-TWO THOUSAND ONE HUNDRED DOLLARS (\$332,100.00), which amount does not include applicable New Mexico gross receipts taxes ("NMGRT"). Compensation shall be paid in accordance with the rate schedule set out in Exhibit "A," attached hereto and made a part hereof for all purposes.
- 2. Monthly Invoices.** Contractor shall submit itemized invoices to County's Project Manager showing amount of compensation due, amount of any NMGRT, and total amount payable. Payment of undisputed amounts shall be due and payable thirty (30) days after County's receipt of the invoice. All disputes related to performance and payment shall be governed by the County's Procurement Code, Chapter 31.
- 3. Deemed Acceptance.** If due to reasons beyond Contractor's control, acceptance does not take place within 60 (sixty) days from the date the final written IRP report is due to County, acceptance shall be deemed to take place upon expiry of said period of time.

SECTION D. TAXES: Contractor shall be solely responsible for timely and correctly billing, collecting and remitting all NMGRT levied on the amounts payable under this Agreement.

SECTION E. STATUS OF CONTRACTOR, STAFF, AND PERSONNEL: This Agreement calls for the performance of services by Contractor as an independent contractor. Contractor is not an agent or employee of County and will not be considered an employee of County for any purpose. Contractor, its agents or employees shall make no representation that they are County employees, nor shall they create the appearance of being employees by using a job or position title on a name plate, business cards, or in any other manner, bearing the County's name or logo. Neither Contractor nor any employee of Contractor shall be entitled to any benefits or compensation other than the compensation specified herein. Contractor shall have no authority to bind County to any agreement, contract, duty or obligation. Contractor shall make no representations that are intended to, or create the appearance of, binding County to any agreement, contract, duty, or obligation. Contractor shall have full power to continue any outside employment or business, to employ and discharge its employees or associates as it deems appropriate without interference from County; provided, however, that Contractor shall at all times during the term of this Agreement maintain the ability to perform the obligations in a professional, timely and reliable manner.

SECTION F. STANDARD OF PERFORMANCE: Contractor agrees and represents that it has and will maintain the personnel, experience and knowledge necessary to qualify it for the particular duties to be performed under this Agreement. Contractor shall perform the Services described herein in accordance with a standard that exceeds the industry standard of care for performance of the Services.

SECTION G. DELIVERABLES AND USE OF DOCUMENTS: County shall own all right, title and interest in the tangible deliverables provided by Contractor under this Agreement. Ownership of any existing or developed intellectual property, including that embedded in the deliverables, shall remain at all times with Contractor. Contractor grants County a non-exclusive, governmental, irrevocable, world-wide, license to use Contractor's intellectual property embedded in the deliverables solely for the purposes provided under the Agreement and as required by law. Except as expressly granted herein, nothing contained in this Agreement shall be deemed to grant any license under any intellectual property right other than those expressly granted herein.

SECTION H. EMPLOYEES AND SUB-CONTRACTORS: Contractor shall be solely responsible for payment of wages, salary or benefits to any and all employees or contractors retained by Contractor in the performance of the Services. Contractor agrees to indemnify, defend and hold harmless County for any and all claims that may arise from Contractor's relationship to its employees and subcontractors.

SECTION I. INSURANCE: Contractor shall obtain and maintain insurance of the types and in the amounts set out below throughout the term of this Agreement with an insurer acceptable to County. Contractor shall assure that all subcontractors maintain like insurance. Compliance with the terms and conditions of this Section is a condition precedent to County's obligation to pay compensation for the Services and Contractor shall not provide any Services under this Agreement unless and until Contractor has met the requirements of this Section. County requires Certificates of Insurance or other evidence acceptable to County that Contractor has met its obligation to obtain and maintain insurance and to assure that subcontractors maintain like insurance. Should any of the policies described below be cancelled before the expiration date thereof, notice will be delivered in accordance with the policy provisions. General Liability Insurance and Automobile Liability Insurance shall name County as an additional insured.

1. **General Liability Insurance:** ONE MILLION DOLLARS (\$1,000,000.00) combined single limit per occurrence; TWO MILLION DOLLARS (\$2,000,000.00) aggregate.
2. **Workers' Compensation:** In an amount as may be required by law. County may immediately terminate this Agreement if Contractor fails to comply with the Worker's Compensation Act and applicable rules when required to do so.
3. **Automobile Liability Insurance for Contractor and its Employees:** ONE MILLION DOLLARS (\$1,000,000.00) combined single limit per occurrence; TWO MILLION DOLLARS (\$2,000,000.00) aggregate on any owned, and/or non-owned motor vehicles used in performing Services under this Agreement.
4. **Professional Liability Insurance:** ONE MILLION DOLLARS (\$1,000,000.00). Professional Liability Insurance shall provide coverage for Services provided hereunder during the term of this Agreement and for a period of at least five (5) years thereafter.

SECTION J. RECORDS: Contractor shall maintain, throughout the term of this Agreement and for a period of six (6) years thereafter, records that indicate the date, time, and nature of the

services rendered. Contractor shall make available, for inspection by County, all records, books of account, memoranda, and other documents pertaining to County at any reasonable time upon request.

SECTION K. APPLICABLE LAW: Contractor shall abide by all applicable federal, state and local laws, regulations, and policies and shall perform the Services in accordance with all applicable laws, regulations, and policies during the term of this Agreement. In any lawsuit or legal dispute arising from the operation of this Agreement, Contractor agrees that the laws of the State of New Mexico shall govern. Venue shall be in the First Judicial District Court of New Mexico in Los Alamos County, New Mexico.

SECTION L. NON-DISCRIMINATION: During the term of this Agreement, Contractor shall not discriminate against any employee or applicant for an employment position to be used in the performance of the obligations of Contractor under this Agreement, with regard to race, color, religion, sex, age, ethnicity, national origin, sexual orientation or gender identity, disability or veteran status.

SECTION M. INDEMNITY: Contractor shall indemnify, hold harmless and defend County, its Council members, employees, agents and representatives, from and against all third party liabilities, damages, claims, demands, actions (legal or equitable), and costs and expenses, including without limitation attorneys' fees, arising from Contractor's willful misconduct or negligent performance hereunder or breach hereof and the willful misconduct or negligent performance of Contractor's employees, agents, representatives and subcontractors.

County shall provide the Contractor with prompt written notice of any third party claims covered by this Article.

SECTION N. FORCE MAJEURE: Neither County nor Contractor shall be liable for any delay in the performance of this Agreement, nor for any other breach, nor for any loss or damage arising from uncontrollable forces such as fire, theft, storm, war, or any other force majeure that could not have been reasonably avoided by exercise of due diligence.

SECTION O. NON-ASSIGNMENT: Contractor may not assign this Agreement or any privileges or obligations herein without the prior written consent of County.

SECTION P. LICENSES: Contractor shall maintain all required licenses including, without limitation, all necessary professional and business licenses, throughout the term of this Agreement. Contractor shall require and shall assure that all of Contractor's employees and subcontractors maintain all required licenses including, without limitation, all necessary professional and business licenses.

SECTION Q. PROHIBITED INTERESTS: Contractor agrees that it presently has no interest and shall not acquire any interest, direct or indirect, which would conflict in any manner or degree with the performance of its services hereunder. Contractor further agrees that it will not employ any person having such an interest to perform services under this Agreement. No County Council member or other elected official of County, or manager or employee of County shall solicit, demand, accept or agree to accept a gratuity or offer of employment contrary to Section 31-282 of the Los Alamos County Code.

SECTION R. TERMINATION:

1. **Generally.** County may terminate this Agreement with or without cause upon ten (10) days prior written notice to Contractor. Upon such termination, Contractor shall be paid for Services actually completed to the satisfaction of County at the rate set out in Section C. Contractor shall render a final report of the Services performed to the date of termination and shall turn over to County originals of all materials prepared pursuant to this Agreement.
2. **Funding.** This Agreement shall terminate without further action by County on the first day of any County fiscal year for which funds to pay compensation hereunder are not appropriated by the County Council. County shall make reasonable efforts to give Contractor at least ninety (90) days advance notice that funds have not been and are not expected to be appropriated for that purpose.

SECTION S. NOTICE: Any notices required under this Agreement shall be made in writing, postage prepaid to the following addresses, and shall be deemed given upon hand delivery, verified delivery by telecopy (followed by copy sent by United States Mail), or three (3) days after deposit in the United States Mail:

County:

Jordan Garcia, Project Manager
Incorporated County of Los Alamos
1000 Central Avenue, Suite 130
Los Alamos, New Mexico 87544

Contractor:

Todd Thurlow, Vice President
Siemens Industry, Inc.
4401 Fair Lakes Court
Fairfax, Virginia 22033

SECTION T. INVALIDITY OF PRIOR AGREEMENTS: This Agreement supersedes all prior contracts or agreements, either oral or written, that may exist between the parties with reference to the services described herein and expresses the entire agreement and understanding between the parties with reference to said services. It cannot be modified or changed by any oral promise made by any person, officer, or employee, nor shall any written modification of it be binding on County until approved in writing by both County and Contractor.

SECTION U. CAMPAIGN CONTRIBUTION DISCLOSURE FORM: A Campaign Contribution Disclosure Form was submitted as part of the Contractor's Response and is incorporated herein by reference for all purposes. This Section acknowledges compliance with Chapter 81 of the Laws of 2006 of the State of New Mexico.

SECTION V. LIMITATIONS OF LIABILITY: County agrees that Contractor's total liability, and County's sole and exclusive remedy, for damages in any way related to or arising from the performance of Contractor's duties and obligations under this Agreement, whether on claims for breach of contract, warranty, negligence, tort (including strict liability) or otherwise, shall not exceed the amount identified in Section C(1) above. It is agreed by the parties that this sum is reasonable under all the circumstances.

SECTION W. Confidentiality. Confidential Information Disclosure Statement. The Confidential Information Disclosure Statement in Exhibit "B," attached hereto and incorporated herein by reference for all purposes, must be completed by Contractor as a condition precedent and submitted as part of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement on the date(s) set forth opposite the signatures of their authorized representatives to be effective for all purposes on the date first written above.

ATTEST

INCORPORATED COUNTY OF LOS ALAMOS

SHARON STOVER
COUNTY CLERK

BY: _____
TIMOTHY GLASCO **DATE**
UTILITIES MANAGER

Approved as to form:

KATHRYN S. THWAITS
ACTING COUNTY ATTORNEY

SIEMENS INDUSTRY, INC. A DELAWARE CORPORATION

BY: _____
ADRIAN ROUSE **DATE**
HEAD ENERGY BUSINESS ADVISORY

SIEMENS INDUSTRY, INC. A DELAWARE CORPORATION

BY: _____
MARTIN WEISS **DATE**
FINANCIAL CONTROLLER, PTI SEGMENT

EXHIBIT A
AGR17-10

Rate Schedule

Contractor shall charge a fixed price of \$175,000 for the Core Initial Study, which entails stochastic analysis of six portfolios across two CPP cases as defined in Section A above. This fixed-price, includes the presentation of the preliminary report to County and its results to the Board of Public Utilities by two Contractor team members. If additional trips are requested for the stakeholder meeting or the staff meetings, the travel for each would be capped at a cost of \$3250 per person and will be billed at cost. The team will request approval from the DPU prior to making any travel plans.

If requested by County to analyze more than six portfolio options as indicated in the Section A above, Contractor shall bill based upon the rate schedule defined below:

Core Initial Study \$175,000 Fixed Price (6 portfolios – 2 CPP options)

- Short Term IRP – Hours by Task and Key Team:

Project Team Member	Project Management	Assumptions Metrics	Portfolio Definition	Portfolio Screening	Stochastic Risk Analysis	Report	Total Hours	Cost
Gary Vicinus	6	2	2	3	3	1	16	\$8,600
Fengrong Li	16	0	3	0	0	3	22	\$8,822
Chuck Fan	7	1	0	2	4	1	15	\$6,212
Melissa Haugh	0	1	0	0	0	0	2	\$720
Halt Bradshaw	0	1	0	0	0	0	2	\$630
Karthik Viswanathan	0	10	0	0	10	0	19	\$7,103
Brian Kwak	5	0	6	6	6	0	24	\$7,695
Peter Hubbard	0	3	0	0	0	0	3	\$1,226
Kwang Kim	0	2	5	10	14	2	33	\$10,618
Paul Sharpe	0	2	5	10	14	5	36	\$10,572
Olivia Valentine	0	3	3	10	14	5	35	\$7,802
Total	34	25	25	42	65	17	208	\$70,000

- Long Term IRP – Hours by Task and Key Team:

Project Team Member	Project Management	Assumptions, Metrics	Portfolio Definition	Portfolio Screening	Stochastic Risk Analysis	Report	Total	Cost
Gary Vicinus	10	3	3	4	4	1	26	\$13,788
Fengrong Li	26	0	5	0	0	4	35	\$14,145
Chuck Fan	11	2	0	4	6	2	25	\$9,959
Melissa Haugh	0	2	0	1	0	0	3	\$1,155
Halt Bradshaw	0	2	0	0	0	0	2	\$1,010
Karthik Viswanathan	0	10	0	0	10	0	21	\$7,536
Brian Kwak	5	0	7	7	7	0	26	\$8,165
Peter Hubbard	0	3	0	0	0	0	4	\$1,310
Kwang Kim	0	4	9	20	23	3	58	\$18,475
Paul Sharp	0	3	9	16	23	9	58	\$16,949
Olivia Valentine	0	4	4	16	23	9	56	\$12,509
Total	52	34	36	68	95	28	312	\$105,000

Additional travel	\$3,250	per trip (optional at County's request)
Additional Portfolios	\$5,000	per portfolio (beyond 6)
Additional post 2025 options	\$5,000	per option (beyond extend as is and one additional)
Value of Selling Unit 4	\$8,000	optional assessment – fixed price

IRP Update \$100,000 Based on scope in accordance with rates below:

Project Team Member	Project Management	Assumptions Metrics	Portfolio Definition	Portfolio Screening	Stochastic Risk Analysis	Report	Total	Cost
Gary Vicinus	10	3	3	4	4	1	27	\$14,130
Fengrong Li	11	0	5	0	0	4	21	\$8,312
Chuck Fan	11	2	0	4	6	2	25	\$10,206
Melissa Haugh	0	2	0	1	0	0	3	\$1,183
Halt Bradshaw	0	2	0	0	0	0	3	\$1,035
Karthik Viswanathan	0	17	0	0	0	0	17	\$6,038
Brian Kwak	17	2	2	2	2	2	26	\$8,235
Peter Hubbard	0	5	0	0	0	0	5	\$1,739
Kwang Kim	0	4	9	20	23	3	59	\$18,932
Paul Sharp	0	3	9	16	23	9	60	\$17,369
Olivia Valentine	0	4	4	16	23	9	57	\$12,819
Total	49	43	32	64	82	30	301	\$100,000

EXHIBIT B
AGR17-10

Confidential Information Disclosure Statement

The Incorporated County of Los Alamos is a governmental entity subject to certain disclosure laws including, but not limited to, the New Mexico Inspection of Public Records Act (1978) NMSA §§14-2-1, et seq. Nothing in this agreement is intended to diminish or expand the application of any applicable disclosure laws to any proprietary or confidential information.

This Confidential Information Disclosure Statement ("Statement") defines obligations and waivers related to Confidential Information disclosed pursuant to the above referenced Agreement between County and Contractor. County and Contractor agree to the following:

1. Statement Coordinator – Each party designates the following person as its Statement Coordinator for coordinating the disclosure or receipt of Confidential Information:

Contractor: _____

County: _____

2. Definitions:

- a) **Confidential Information** - any form of information, in any format, disclosed by the Discloser to the Recipient and identified as confidential.
- b) **Discloser** - the party disclosing Confidential Information.
- c) **Exception** – An exception is satisfied if the Confidential Information disclosed: (i) was in Recipient's possession prior to receipt from Discloser, (ii) is publicly known or readily ascertainable by legal means, (iii) is lawfully received by Recipient from a third party without a duty of confidentiality, (iv) is disclosed by Discloser to a third party without a duty of confidentiality on the third party, (v) is independently developed or learned by Recipient, or (vi) is disclosed by Recipient with Discloser's prior written approval.
- d) **Recipient** – the party receiving Confidential Information.

3. Obligations – Recipient shall protect and ensure its participating subcontractors, agents, or associates will protect all Confidential Information by using the same degree of care, but no less than a reasonable degree of care, to prevent the unauthorized use, dissemination, or publication of the Confidential Information as Recipient uses to protect its own information of a like nature. If any person or entity requests or demands, by subpoena or otherwise, all or any portion of the confidential information provided by one party to another, the party receiving such request shall immediately notify the Discloser of such request or demand. The party receiving the request or demand shall independently determine whether the information sought is subject to disclosure under applicable law including the New Mexico Inspection of Public Records Act. If the party receiving the request or demand determines that the information is subject to disclosure, it shall notify the Discloser of its intent to permit the disclosure with sufficient time to permit the Discloser to invoke the jurisdiction of an appropriate court or administrative body to raise any legitimate objections or defenses it may have to the disclosure. In the absence of an appropriate order prohibiting the disclosure, the party receiving the

request or demand shall permit and proceed with the disclosure without incurring any duty, obligation or liability to the Discloser.

4. **Termination** - (i) Except as provided in subparagraph (ii) following, upon termination for any reason of the above referenced Agreement, Recipient shall return or destroy all Confidential Information received on behalf of the Discloser. This provision shall apply to Confidential Information that is in the possession of subcontractors, agents, or associates of Recipient. (ii) If Recipient determines that returning or destroying Confidential Information is not feasible, Recipient shall provide to Discloser written notification of the conditions that make return or destruction infeasible. Upon mutual agreement of the parties that return or destruction of the Confidential Information is not feasible, Recipient shall extend the protections of this Confidential Information Disclosure Statement to such Confidential Information and shall limit further uses and disclosures of such Confidential Information to those purposes that make the return or destruction infeasible, for so long as Recipient maintains such Confidential Information. (iii) The respective rights and obligations of Recipient under this paragraph shall survive the termination of the Agreement of the parties to which this Confidential Information Disclosure Statement attaches.
5. **Choice of Law** – Without regard to conflict of law provisions, this Statement is governed by and shall be construed in accordance with the laws of the State of New Mexico.
6. **Miscellaneous** – Except as otherwise provided in the above-referenced agreement Between County and Contractor, all Confidential Information provided under the above referenced Agreement is proprietary in nature and belongs to and shall inure to the benefit of the Discloser. Recipient shall not acquire any patent, copyright, mask work, or trademark rights under this Statement. This Statement imposes no obligation on either party to purchase, sell, license, transfer, or otherwise dispose of any technology, service, or product; does not create any agency or partnership relationship; may be added to or modified only in a writing signed by both parties, supersedes all oral or implied agreements concerning Confidential Information; and may be signed in duplicate originals, or in separate counterparts, which are effective as if the parties signed a single original. A facsimile of an original signature transmitted to the other party is effective as if the original was sent to the other party.
7. **Indemnity** – Contractor shall indemnify, hold harmless, and defend County, its Council Members employees, agents, and representatives, from and against all liabilities, damages, claims, demands, actions (legal and equitable), and costs and expenses, including without limitation attorney's fees, of any kind or nature, arising from Contractor's performance hereunder or breach hereof or the performance of Contractor's employees, agents, representatives, and subcontractors.

Signed this ___ day of _____, 20__

Contractor

County

By

By

Title

Title

BOARD OF PUBLIC UTILITIES

ADDITIONAL MEETING DOCUMENTS

Additional or revised information or documents are often passed out to the Board at the meetings. Whenever possible, this informational cover page will accompany those documents.

MAKE 20 COPIES OF ANY DOCUMENTS, INCLUDING THIS COVER SHEET, AND RETURN TO JAIME KEPHART PRIOR TO THE MEETING.

MEETING DATE	10/19/2016
AGENDA ITEM	6.A. Approval of Services Agreement No. AGR17-10 with Siemens Industry, Inc.
DOCUMENT TITLE(S)	Power Point Presentation
FROM	Steve Cummins/Jordan Garcia
NEW OR REVISED? Is this a revision that is different than what was in the agenda packet or is it something entirely new?	NEW
RECOMMENDED ACTION If you have a new or revised recommended motion for the Board, enter it here.	<u>N/A</u>
ADDITIONAL INFORMATION Please VERY BRIEFLY explain the purpose of this information or document.	This is a copy of the presentation Steve Cummins and Jordan Garcia will give at the meeting.



Integrated Resource Plan

Scope of Work Summary



General Services

- Plan for near-term decisions under the requirements of the current Electric Coordination Agreement between County and Department of Energy-Los Alamos National Laboratory (“DOE-LANL”)
- Plan for near-term and long-term decisions in multiple areas as County implements the policies adopted by the Board of Public Utilities (“BPU”).
- Update IRP (Spring of 2018)

Things to be Considered

- County and DOE-LANL post 2025 Energy Coordinating Agreement (“ECA”)
- Portfolio of resources - carbon neutral by 2040
- San Juan Generating Station – PPA expires 2022
- Value of Unit 4 at the San Juan Generating Station post 2022
- Utah Association of Municipal Power Systems (“UAMPS”) Carbon Free Power Project (“CFPP”)
- Transmission for the CFPP - combined Independent System Operator (“ISO”)
- Opportunities for cost-effective demand-side programs, including energy efficiency, demand response, and distributed energy storage
- Economic operations inside the Balancing Area of the Public Service Company of New Mexico
- Laramie River Station Power Purchase Agreement (“PPA”)
- Policies established by the County’s Future Energy Resource (FER) Committee

Phase I: Initiation of the IRP Process

Data Gathering

- load forecasts, existing resource characteristics, take or pay gas and coal supply contracts, power purchase agreements, fuel forecasts and, market forecasts
- Summary of all key assumptions that will drive these forecasts



Establish Objectives and Metrics

- Establish goals and objectives and key metrics that will be used to evaluate the recommended Portfolios
- Identifying a portfolio that is lowest cost, minimizes risks or stable rates, ensures reliability, meets environmental stewardship standards
- Identify a portfolio that provides for needed diversity or flexibility as markets evolve
- Portfolio will also consider the County's goal of being carbon neutral by 2040

Phase II: Post 2025 Assessment of ECA

- Assess Portfolios that would
 - meet both group's objectives and constraints under the existing ECA terms and conditions
 - meet both group's objectives and constraints under new terms and condition
 - What might change if LAC and LANL operated independently (and compare the cost implications)
- Maximize value under different contractual assumptions
- Test to see the cost implications of each over different future market outcomes



Phase III: Conducting the IRP

- First focus on decisions between 2016 and 2025
 - First period, assessment will be based on the joint interests of the current contract with LANL
- Second focus on the 2026-2036, to guide near-term and long-term decisions
 - Second period, consider evaluating resources based upon the most likely contractual arrangement with LANL, post-2025

Task 1: Baseline, high and low forecasts for the following key variables over the planning horizon:

- Natural gas markets
- Coal markets and prices, including coal transportation
- Oil prices for specified products at major shipping points if needed
- Emission prices (Carbon, SO₂, NO_x) and emissions
- Technology capital costs for a specified group of technologies
- Power prices (peak and off-peak)
- Plant retirements and builds
- Electricity demand



Transmission

- Assess at high level what, if any, impacts on the Regional Transmission Operator (RTO) options in the region have on potential investments in the UAMPs CFPP or other transmission needs for new generation outside New Mexico



Task 2: Technology Option Screening and Portfolio Development

- Screening analysis to rank different technologies and combinations of these technologies in the short, medium and long term
- Identify portfolio specifications that will include:
 - technology choice, size, and timing of the resource addition
 - portfolio specifications will be diverse enough to evaluate all of the things to be considered as identified above, but focused enough to represent a full range of plausible options

Technology Option Screening and Portfolio Development

- A [reference case resource plan](#), which will assume no new builds or retirements; this plan will provide a frame of reference for each of the other portfolio options
- Continuation of Laramie River
- Continuation of the UAMPs nuclear option
- The purchase of ownership shares in combined cycle power plant
- Extension of Participation Agreement in the San Juan coal plant to 2027 or 2035
- The purchase of capacity and energy from the market
- Long-term Power Purchase Agreement of renewables (wind or solar)
- Build renewables (solar or wind – utility scale – community solar)
- DER penetration, energy efficiency and DSM options
- A combination of small reciprocating engines
- Energy storage



Task 3: Portfolio Analysis

- Develop six portfolios for further evaluation of the overall risks and tradeoffs to sufficiently address County's primary objectives:
 - Managing rate and system stability
 - Costs
 - Market exposure
 - Environmental compliance and stewardship
 - BPU Strategic Policy for Electrical Energy Resources

Portfolio Analysis Cont.

Develop model to capture uncertainty of the market drivers including:

- The expected trajectories and distributions of peak and average loads for WECC, New Mexico, and LANL, considering different plausible scenarios of energy efficiency penetration and transportation electrification.
- The expected trajectory and distribution of natural gas prices considering
 - Expected evolution of the natural gas transportation infrastructure
 - Factors driving supply and demand such as Liquefied Natural Gas exports.
- Coal Prices, considering fundamental economics of mining, and effect of commodity prices on transportation cost of coal from mine mouth to plant sites
- Generation Technology Capital costs
- CO₂ prices, differing scenarios of environmental legislation as well market design and market forces affecting cost of compliance
- Review of historic volatility and expected impacts of specific anticipated events

Project Schedule

- November 8 Kick- Off Meeting
- November 22 Finalize operating parameters of existing fleet, objectives, metrics and portfolio options
- December 7 Complete load forecast
- January 23 Select Final Portfolios
- February 17 Complete Risk Analyses
- February 27 Present preliminary findings (60% within 120 days) and results of initial portfolio analysis, including supporting analysis
- March 15 Deliver updated findings and detailed presentation to management or to the BPU
- March 21 Deliver final presentation and written IRP report to County Council
- At the County's request the update will be conducted over a four (4) month period, following a similar schedule to the one above.



Contract Term & Compensation

Compensation

Development of IRP	\$211,000
Contingency	\$21,100
IRP update (2018)	\$100,000
Total not-to-exceed Cost	\$332,100

Term – October 31, 2016 thru November 1, 2018



QUESTIONS

BOARD OF PUBLIC UTILITIES

ADDITIONAL MEETING DOCUMENTS

Additional or revised information or documents are often passed out to the Board at the meetings. Whenever possible, this informational cover page will accompany those documents.

MAKE 20 COPIES OF ANY DOCUMENTS, INCLUDING THIS COVER SHEET, AND RETURN TO JAIME KEPHART PRIOR TO THE MEETING.

MEETING DATE	10/19/2016
AGENDA ITEM	6.E. Water System Needs and Cost Structure
DOCUMENT TITLE(S)	Power Point Presentation
FROM	Jack Richardson
NEW OR REVISED? Is this a revision that is different than what was in the agenda packet or is it something entirely new?	NEW
RECOMMENDED ACTION If you have a new or revised recommended motion for the Board, enter it here.	<u>N/A</u>
ADDITIONAL INFORMATION Please VERY BRIEFLY explain the purpose of this information or document.	This is a copy of the presentation Jack Richardson will give at the meeting.

Water Systems Needs and Cost Structure Report

Board of Public Utilities

BPU Meeting of 19 October 2016



Objectives for Water System Needs and Cost Structure Report (1 of 2)

- Analyze the change in annual water sales volumes
 - Wholesale Water Production Sales to LA County DW & LANL
 - Retail to LA County Customers (Residential, Commercial, Etc.)
 - Non Potable (NP) System Water Use Projections
- Determine weather impacts to water sales (Temp. or Precip.)
- Discuss water system condition & needs assessment
 - 2007 Condition Assessment Study
 - NP Water System Master Plan - 2013
 - Asset Management Teams & Quarterly Condition Assessment Meetings
 - Physical and Financial Condition
- Discuss historic CIP Program expenditures
- Discuss recommended future CIP Program expenditures
- Compare historic and future CIP Program expenditures to AWWA National Standards
- Future Plans for GIS Enhancement for Asset Management and Condition & Risk Assessment

Objectives for Water System Needs and Cost Structure Report (2 of 2)

- Describe the Financial Policy Cash Reserve Requirements and their Implementation for the Water Production, Water Distribution and NP Water Systems
 - Contingency Reserve
 - Retirement/Reclamation Reserve
 - Combination of Reserves / Timing of Need
- Develop Alternative Financial Scenarios
 - Various CIP Approaches (Annual Expenditures vs CIP Project Timing)
 - Various Water Rates (Wholesale, Retail & NP)
 - NP Rates (Balance w/ WP Rates or Cover O&M and/or R&R Expenses)
- Summarize Cash Balances for Alternative Scenarios
 - Impacts of Single Large Expenditure Projects (WP Wells in 2017, 2022, 2026, 2030 & 2036)
 - Rate Stability versus Cash Balance Over/Under
- Recommendations and Necessary Refinements
 - Accelerated CIP Program in the DW System
 - Extend Historic CIP Program in the WP & NP Systems
 - Keep Rate Adjustments as Consistent Year to Year as Possible
 - Continually Refine the Forecast Data & Model
 - Allow Cash Balances to Fluctuate Over & Under the Financial Policy Recommendation

Water Sales Volumes

- Budgeted vs Actual Sales Volumes for 9 Years
- 2007 thru 2015 (Total/Retail/LANL)
- Data Source – DPU Quarterly Reports
- Annual Mean Temperature
- Precipitation
 - Annual Total
 - 1st Quarter Total (July thru Sept)
 - 4th Quarter Total (Apr thru June)
- Trend Lines Indicate General Patterns Only
- More Refined and Detailed Data Required to Make any Informed Determination of Temperature or Precipitation Impacts to Water Use
- NP System Water Use Projections are Based on the NP System Master Plan and In-House Memos Regarding Actual NP Water Availability

FIG 1 - Budget vs Actual Water Sales w/ Precip. & Temp.

Budgeted versus Actual Water Sales with Precipitation & Temperature Variables

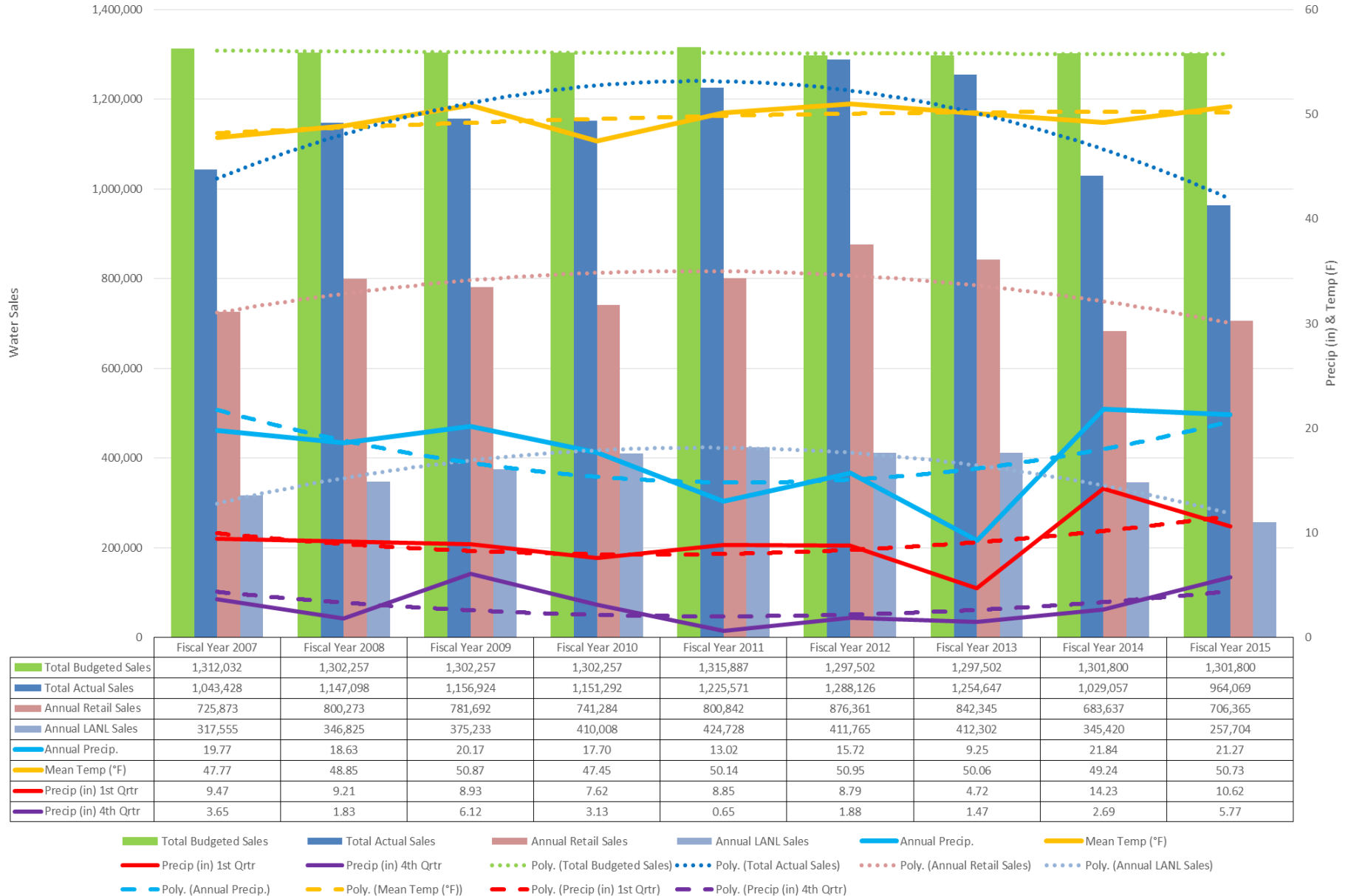


FIG 2 - Precipitation vs Water Sales Variance Percentage

Percentage Precipitation Variance versus Percentage Water Sales Variance - FY2007 thru FY2015

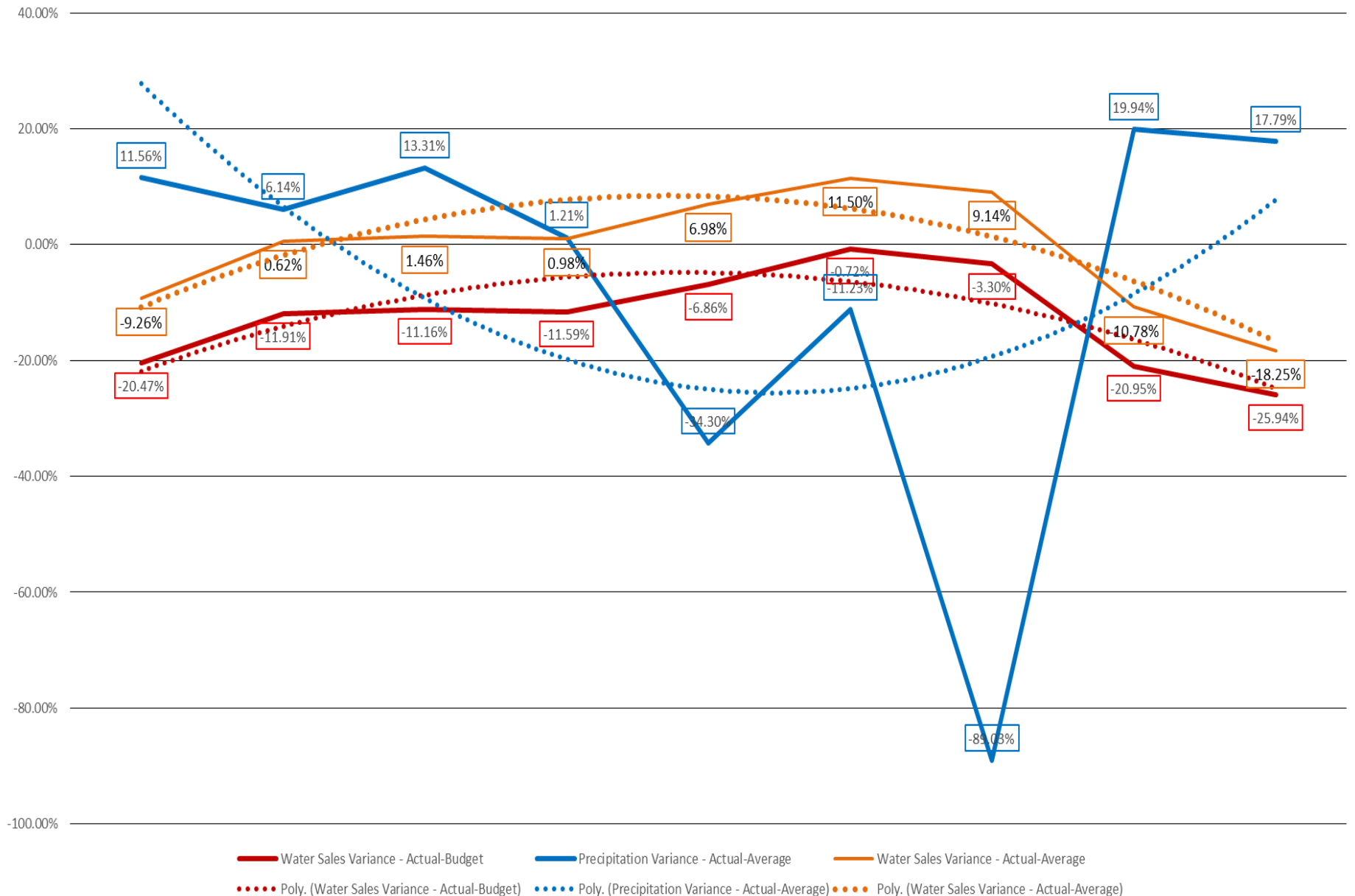


FIG 3 - NP Water Use Projections

NP Water Use Projections / 6 October 2016 / BPU Water System Report

Fiscal Year	Townsite	White Rock	Ski Hill	TOTAL (gallons)	TOTAL (kgals)
2016	63,100,000	18,900,000	2,500,000	84,500,000	84,500
2017	65,000,000	18,900,000	2,500,000	86,400,000	86,400
2018	65,000,000	18,900,000	2,500,000	86,400,000	86,400
2019	69,000,000	18,900,000	2,500,000	90,400,000	90,400
2020	69,000,000	18,900,000	2,500,000	90,400,000	90,400
2021	69,000,000	23,000,000	2,500,000	94,500,000	94,500
2022	69,000,000	23,000,000	2,500,000	94,500,000	94,500
2023	69,000,000	37,100,000	2,500,000	108,600,000	108,600
2024	96,900,000	37,100,000	2,500,000	136,500,000	136,500
2025	96,900,000	37,100,000	2,500,000	136,500,000	136,500
2026	96,900,000	37,100,000	2,500,000	136,500,000	136,500
2027	96,900,000	37,100,000	2,500,000	136,500,000	136,500
2028	96,900,000	37,100,000	2,500,000	136,500,000	136,500
2029	96,900,000	37,100,000	2,500,000	136,500,000	136,500
2030	96,900,000	37,100,000	2,500,000	136,500,000	136,500
2031	96,900,000	37,100,000	2,500,000	136,500,000	136,500
2032	96,900,000	37,100,000	2,500,000	136,500,000	136,500
2033	96,900,000	37,100,000	2,500,000	136,500,000	136,500
2034	96,900,000	37,100,000	2,500,000	136,500,000	136,500
2035	96,900,000	37,100,000	2,500,000	136,500,000	136,500
2036	96,900,000	37,100,000	2,500,000	136,500,000	136,500

2007 Study – Executive Summary

DEPARTMENT OF PUBLIC UTILITIES INCORPORATED COUNTY OF LOS ALAMOS



WATER SYSTEMS CONDITION ASSESSMENT 2007

EXECUTIVE SUMMARY

Local governments throughout the nation are at a turning point where significant new investments will be required as many water infrastructure assets approach their useful lives. Since pipes have long service lives, our generation is the first to have to place significant focus on reinvestment into these systems. Strategies need to be developed to prolong the life of water infrastructure assets and develop an educated decision process about when the time will come to replace them. Existing infrastructure was built over several generations and replacing water infrastructure based on age and service life alone is not a realistic achievement due to the extensive costs. This condition assessment of the distribution and transmission systems will assist the Utility Department in implementing an informed and affordable replacement program.

The water distribution system's most pressing needs are main and service replacements on the oldest infrastructure due to the materials used in the construction of that era. Capital improvement planning should include ongoing budgeting and replacement of portions of the distribution system in the Western Area, Eastern Area and North Community in upcoming decades. These same areas of the community also have the oldest and most deteriorated roadway infrastructure. Waterline replacement in the Western Area, Eastern Area and North Community should be completed before, or as part of, roadway projects. Operation and maintenance practices with respect to metering and water loss prevention are effective, extend the service life of the infrastructure, and should be continued. Per criteria established by the industry and by comparison with other water utilities fire protection and water loss are exemplary.

The water distribution system's most pressing needs are main and service replacements on the oldest infrastructure due to the materials used in the construction of that era. Capital improvement planning should include ongoing budgeting and replacement ... in the Western Area, Eastern Area and North Community in upcoming decades.

Waterline replacement ... should be completed before, or as a part of, roadway projects.

O&M practices with respect to metering and water loss prevention ... should be continued.

Water System Condition (1 of 3)

- 2007 Water Systems Condition Assessment Executive Summary
- Historic CIP Program and New Meter Replacement Program are Carrying Out the 2007 Study Recommendations
- Figures 5 thru 12 Show Current Status of Water Pipelines Year Installed & Age / Size / Material
- Year Installed Figures Show Consistency with 2007 Study
- AWWA (American Water Works Association)
 - Benchmarking / Performance Indicators for Water & Wastewater
 - Historic CIP Program for WP & DW at “Top Quartile” Value
 - Recommended CIP Program for WP & DW at “Median” Value
 - System Repair & Replacement (%) = Total Expenses / Total PWV
 - Total PWV = (Land + Utility Plant In Service + Machinery & Equipment) – (Accumulated Depreciation)
- WP CIP Program
 - \$1,500,000 per Year Historic
 - \$1,500,000 per Year Until “Catch Up” Plus \$3,000,000 X 5 for Known Wells
 - \$750,000 per Year After “Catch Up” (Plus Any Future Well Replacements)
 - “Catch Up” Approximately 13 Years Away {@ \$1,500,000 per Year}
- WP Operations & Maintenance Expenditures
 - 7-Year Trend is 1.5% Average Annual Increase

FIG 4 - AWWA / System R & R

System Renewal & Replacement AWWA National Standard Percentages

Asset Class	System Repair & Replacement Percentage			Present Worth Value of the GWS Group System	Annual Repair & Replacement National Standard (PWV) X (System R&R %)		
	Bottom Quartile	Median	Top Quartile		Bottom Quartile	Median	Top Quartile
Water Supply	0.8%	1.5%	3.7%				
Water Treatment Facilities	0.7%	1.9%	5.0%				
Water Pump Station	0.6%	2.6%	5.5%				
Water Transmission and Distribution	1.0%	2.4%	4.5%				
Wastewater Collection	1.3%	2.5%	5.2%				
Wastewater Pump Stations	0.7%	2.1%	5.9%				
Wastewater Treatment	1.1%	2.2%	4.4%				
Water Production	0.775%	2.1%	4.675%	\$39,939,696	\$309,533	\$838,734	\$1,867,181
Water Distribution	1.0%	2.4%	4.5%	\$17,117,013	\$171,170	\$410,808	\$770,266
Wastewater Collection	1.0%	2.3%	5.55%	\$19,989,785	\$199,898	\$459,765	\$1,109,433
Wastewater Treatment	1.10%	2.20%	4.40%	\$13,326,524	\$146,592	\$293,184	\$586,367

Water System Condition (2 of 3)

- AWWA (American Water Works Association)
 - Benchmarking / Performance Indicators for Water & Wastewater
 - Historic CIP Program for WP & DW at “Top Quartile” Value
 - Recommended CIP Program for WP & DW at “Median” Value
 - System Repair & Replacement (%) = Total Expenses / Total PWV
 - Total PWV = (Land + Utility Plant In Service + Machinery & Equipment) – (Accumulated Depreciation)
- DW CIP Program
 - \$750,000 per Year Historic
 - \$750,000 per Year Until “Catch Up”
 - \$500,000 per Year After “Catch Up”
 - “Catch Up” Approximately 13 Years Away {@ \$750,000 per Year}
- DW Operations & Maintenance Expenditures
 - 7-Year Trend is 7.4% Average Annual Increase However this includes Several Major New Initiatives (AMI Meter Replacement, Valve & PRV O&M Initiatives, Etc.)
 - Use 1.5% Annual Trend for Forecasting

FIG 4 - AWWA / System R & R

System Renewal & Replacement AWWA National Standard Percentages

Asset Class	System Repair & Replacement Percentage			Present Worth Value of the GWS Group System	Annual Repair & Replacement National Standard (PWV) X (System R&R %)		
	Bottom Quartile	Median	Top Quartile		Bottom Quartile	Median	Top Quartile
Water Supply	0.8%	1.5%	3.7%				
Water Treatment Facilities	0.7%	1.9%	5.0%				
Water Pump Station	0.6%	2.6%	5.5%				
Water Transmission and Distribution	1.0%	2.4%	4.5%				
Wastewater Collection	1.3%	2.5%	5.2%				
Wastewater Pump Stations	0.7%	2.1%	5.9%				
Wastewater Treatment	1.1%	2.2%	4.4%				
Water Production	0.775%	2.1%	4.675%	\$39,939,696	\$309,533	\$838,734	\$1,867,181
Water Distribution	1.0%	2.4%	4.5%	\$17,117,013	\$171,170	\$410,808	\$770,266
Wastewater Collection	1.0%	2.3%	5.55%	\$19,989,785	\$199,898	\$459,765	\$1,109,433
Wastewater Treatment	1.10%	2.20%	4.40%	\$13,326,524	\$146,592	\$293,184	\$586,367

Water System Condition (3 of 3)

- AWWA (American Water Works Association)
 - No Benchmarking / Performance Indicators for Non Potable Systems
- NP CIP Program
 - Error in Report – Not All Expansion but 50% Expansion & 50% Reservoir O&M
 - \$957,000 per Year Historic / System Relatively New so No “Catch Up” Required
 - \$893,000 per Year Proposed 8-Year CIP 2017 thru 2024 Based on NP Master Plan CIP Recommendations to Expand Service Throughout White Rock and the Diamond Drive Corridor
 - \$500,000 per Year Typical CIP Program Starting 2025
 - All NP System CIP Projects Assumed Financed by New Mexico Water Trust Board @ 60% Loan & 40% Grant with Debt Service Accumulating on the Loan Portion of the WTB Financing
- NP Operations & Maintenance Expenditures
 - Reliable Annual O&M Data Trend is a Few Years Away / Accounting Revisions Have Been Developed and Initiated to Capture this Data
 - Use 1.5% Annual Trend for Forecasting

Future Planned Asset Management Enhancements

- Expanded and Enhanced Use of GIS System
 - Expanded Field Inspection Forms Consistent with GIS Attribute Data Structure
- Consistent with National Asset Management Standards
- Condition Assessment Data Added to GIS Attribute Data Tables
 - Definitions with Estimated Life Spans: 10 thru 100 Years
 - Simple System of Condition Ratings: 1 thru 5
 - Operational / Structural Condition
 - Capacity Condition
 - Time Since Condition Assessment
 - Condition Assessment Methodology
- Risk Assessment
 - Risk Type
 - Hazard Effect / Consequence
 - Likelihood of Occurrence
- GIS Asset Management / Condition & Risk Assessment Report
 - Very Rough Draft
 - Detailed or Summary Report
 - Condition & Risk Assessment Value (Per Asset or Per Asset Group Average)
 - Replacement Cost and/or PWV and/or Fixed Asset Value (Asset or Group)

Asset Management Definitions & Descriptions

DPU - ASSET MANAGEMENT, CONDITION ASSESSMENT, RISK ASSESSMENT AND ASSET PRESENT WORTH VALUE DEFINITIONS

AGE

Formula: (Current Year) - (Year Installed)

STANDARD ASSET ESTIMATED LIFE SPAN & ASSET DESCRIPTION

Estimated Life Span	System	Description
100	Gas Distribution System Components	Pipe, valves, PRV's, fittings, etc. Pipe is a grouped asset - defined by pressure class (high or medium), type (main or service), size (diameter) and year installed. Fittings and miscellaneous appurtenances (reducers, transitions, caps, cathodic protection anodes, etc.) are considered insignificant and are lumped into the pipeline asset group. Isolation valves, pressure reducing valves, slam shut valves, etc. are individual assets tracked by size and year installed.
50	Gas Meters	Residential, commercial, municipal, etc. are individual assets tracked by size and year installed.
100	Water Distribution, Water Production & Non Potable Water System Storage Facilities	Storage tanks, open reservoirs, open ponds are individual assets tracked by group (DW, WP, NP) and year installed. The paint systems for steel tanks are tracked as a separate asset.
50	Water Distribution, Water Production & Non Potable Water System Components	Pipe, valves, PRV's, fittings, etc. Pipe is a grouped asset - defined by group (DW, WP, NP), type (main or service), size (diameter) and year installed. Fittings and miscellaneous appurtenances (reducers, transitions, caps, etc.) are considered insignificant and are lumped into the pipeline asset group. Isolation valves, automatic control valves, pressure reducing valves, air release/vacuum valves, etc. are individual assets tracked by size and year installed.
50	Water Production Well House	Each WP Well House is a single fixed asset. All components (well bore hole and casing, well house structure, pipe, isolation valves, control valves, pumps, motors, MCC's, transducers, etc.) are considered integral with the 50 year life of the WH asset and are not tracked as separate fixed assets. All replacement of WH components are considered operational O&M and are not tracked as separate fixed assets. Each individual WH asset is tracked by year installed.
50	Water Production & Non Potable Water Booster Station	Each WP Booster Station is a single fixed asset. All components (booster station structure, pipe, gate valves, control valves, pumps, motors, MCC's, pressure gauges, etc.) are considered integral with the 50 year life of the BS asset and are not tracked as separate fixed assets. All replacement of BS components are considered operational O&M and are not tracked as separate fixed assets. Each individual BS asset is tracked by group (WP, NP) and year installed.
35	Water Distribution, Water Production & Non Potable Water Storage Tank Paint Systems	Interior and exterior paint systems. The paint system is considered an individual asset for each tank. Each individual tank paint system is tracked by group (DW, WP, NP) and year installed.
25	Water Distribution, Water Production & Non Potable Water Meters	Residential, commercial, municipal, WP entry meters, etc. are individual assets tracked by group (DW, WP, NP), size and year installed.
10	Water Production & Non Potable Water Treatment Systems	Each Treatment System is a single fixed asset. All components (tanks, controls, valves, pumps, tubing, process equipment, etc.) are considered integral with the 10 year life of the TS asset. All replacement of TS components are considered operational O&M and are not tracked as separate fixed assets. Each individual TS asset is tracked by group (WP, NP) and year installed.

Condition Assessment Definitions & Descriptions

Condition Value	OPERATIONAL / STRUCTURAL CONDITION	
1	Excellent	Excellent physical condition. Likely to perform adequately without major work for estimated life span. No failures. No corrosion, minor cracking, joint displacement, sediment. No visible roots. Only normal routine maintenance required.
2	Good	Good physical condition. Minimal short term failure risk but potential for deterioration within the estimated life span. Few failures. Minor wear, corrosion, cracking, joint displacement, sediment. Fine hair roots visible. Minor maintenance (if any) required.
3	Fair	Functionally sound physical condition. Showing some wear with minor failures and some diminished efficiency. Deterioration evident. Failure unlikely within the next few years but further deterioration likely with some replacement before estimated life span is met. Minor components or isolated sections need replacement or repair but asset still functions safely at an adequate level of service. Increased operating expenses may be required. Moderate cracking and/or joint displacement. Sediment causing minor blockage. Medium level of root intrusion. Moderate maintenance work required but asset is still servicable.
4	Poor	Functional asset but requires a high level of maintenance to remain at a working level of service. Asset barely servicable. Likely to experience a noticeable deterioration in performance in the short term. Noticeable increased operating costs. Significant corrosion. Extensive cracking and/or joint displacement. Major sediment blockage. Significant root intrusion. No immediate risk to health or safety but significant maintenance or minor renewal/upgrade work required within a few years to ensure asset remains safe.
5	Failed	Failed or failure imminent. Asset essentially unservicable. Effective life has been exceeded and excessive maintenance costs incurred. High risk of breakdown with serious impact on performance. No life expectancy remains. Health and safety hazards exist or asset cannot be operated or serviced without risk to personnel. Major corrosion, cracking and/or joint displacement to the point of pipeline failure. Sediment almost totally blocking pipeline. Root intrusion has been neglected or is almost totally blocking pipeline. Major maintenance work or renewal/upgrade required urgently.
Condition Value	CAPACITY CONDITION	
1	Excellent	Meets all demand requirements.
2	Good	Infrequent peak demand problems but no detectable adverse impacts to cutomers. No known manhole surcharging.
3	Fair	Occasional peak demand problems with minor detectable adverse impacts to customers. Minor manhole surcharging.
4	Poor	Frequent peak demand or occasional average demand problems with obvious detectable adverse impacts to customers. Routine manhole surcharging but not overflowing.
5	Failed	Routine average demand problems with constant or serious impacts to customers. Occasional manhole surcharging to overflow.
TIME SINCE CONDITION ASSESSMENT		
Formula: (Current Year) - (Last Inspection Year)		
Condition Value		
1	Excellent	0 - 5 years
2	Good	6 - 10 years.
3	Fair	11 - 15 years.
4	Poor	16 - 20 years.
5	Failed	21 + years.
Condition Value	CONDITION ASSESSMENT METHODOLOGY	
1	Excellent	Actual recent physical / visual inspection in the last 0 - 3 years.
2	Good	Actual physical / visual inspection in the last 4 - 7 years.
3	Fair	Assumption based on actual adjacent asset inspection.
4	Poor	Assumption based on age and general historic knowledge of the specific component or system.
5	Failed	Assumption based on age only.

Proposed Risk Assessment Matrix

RISK MATRIX			Hazard Effect / Consequence				
Risk Type			Insignificant	Minor	Moderate	Major	Catastrophic
			1	2	3	4	5
Harm To People (Safety - Health)			No injury or health risk	First aid case - exposure to minor health risk	Medical treatment case - exposure to major health risk	Serious injuries requiring medical treatment - reversible impact on health	Fatality or loss of quality of life - irreversible impact on health
Environmental Impact			No environmental harm	Minimal environmental harm - easily remediable	Material environmental harm - remediable short term	Serious environmental harm - remediable with major effort and expense	Major environmental harm - remediable for restoration not possible - only mitigation
Business Impact - Material or Financial Loss			No business disruption - no material or financial loss	Brief business disruption - minor material or financial loss	Partial shutdown - moderate material or financial loss	Partial loss of operation - major material or financial loss	Substantial or total loss of operation - significant material or financial loss
Legal & Regulatory			None to low level legal issue	Minor legal issue or breach of law - non-compliance	Serious breach of law - investigation & report to authorities - prosecution and/or moderate penalty possible	Major breach of law - considerable prosecution and penalties	Very considerable penalties and prosecutions - multiple law suits and jail terms possible
Impact on Reputation - Social - Community			Slight impact - public awareness may exist but no public concern	Limited impact - local public concern	Considerable impact - regional public concern	National impact - national public concern	International impact - international public concern
Likelihood			Risk Factor				
Almost Certain	5	Frequent occurrence - one or more times per year - likely to reoccur within 1 year - almost certain - (1 in 10)	2	3	4	5	5
Likely	4	Infrequent occurrence - less than once per year - likely to reoccur within 5 years - likely - (1 in 100)	2	2	3	5	5
Possible	3	At least one occurrence has happened at some time - could reoccur within 10 years - possible - (1 in 1,000)	1	2	3	4	5
Unlikely	2	At least one occurrence has happened at some time - could happen within 20 years - unlikely - (1 in 10,000)	1	1	2	3	4
Rare	1	Occurrence has never been known to occur - highly unlikely it will occur within 20 years - rare - (1 in 100,000)	1	1	2	2	3
Risk Factor		Risk Level	Guidelines for Risk Matrix				
5		Extreme	Eliminate, avoid, implement specific action plans & procedures to manage & monitor. Immediate action required.				
4		High	Proactively manage. Prioritised action required.				
3		Medium	Actively manage. Planned action required.				
2		Low	Monitor and manage as appropriate. Actioned by routine procedures.				
1		Virtually None	Routine monitoring. No action required.				

Enhanced GIS Condition & Risk Assessment Example

SUMMARY REPORT FOR NP GROUP - FEATURE CLASS VALVES

Total Number of Assets	Total Number of Each Specific Size	SIZE	Total Number of Each Specific Material	MATERIAL	Total Number of Each Specific Status	STATUS	Average Year Installed	ASSET_A REA	ASSET_TY PE	ASSET_N UMB							Average Last Inspection Year	Average Operational Condition	Average Age	Expected Life	Average Age factor	Average Risk Factor	Average Time Since Condition Assessment	Average Condition Assessment Methodology	Average Individual Calculated Condition & Risk Assessment	Average General Individual Risk Assessment	Total Replacement Cost	Total Present Worth Value	Total Feature Class Current System Value
92	9	1	16	DI	86	ACTIVE	2000	NP	VL	#							2012.8587	3.032608696	16.29348	50	0.32587	2	4.141304348	4.782608696	659.8	MEDIUM	\$186,325.00	\$55,285.50	\$0.00
	3	2	10	CI	6	INACTIVE																							
	5	4	2	PVC																									
	17	6	20	HDPE																									
	25	8	2	BRASS																									
	17	10	8	BRONZE																									
	1	12																											
	1	14																											
	0	16																											
	2	24																											

DETAILED REPORT FOR NP GROUP - FEATURE CLASS VALVES

OBJECTID	TYPE	SZ	MATERIAL	STATUS	ADDRESS	STREET	INSTALLED	ASSET_A REA	ASSET_TY PE	ASSET_N UMB	Last Inspec Month	CONDITION	DESCRIPTIO	OWNER	Last Inspec Year	OPERATIONAL CONDITION	AGE	EXPECTED LIFE	AGE FACTOR	RISK FACTOR	TIME SINCE CONDITION ASSESSMENT	CONDITION ASSESSMENT METHODOLOGY	INDIVIDUAL CALCULATED CONDITION & RISK ASSESSMENT	GENERAL INDIVIDUAL RISK ASSESSMENT	COMPLETE REPLACEMENT COST	PRESENT WORTH VALUE	ASSET MANAGEMENT FIXED ASSET DEPRECIATED VALUE
1	GATE VALVE	10DI	DI	ACTIVE		CAMP MAY RD	2009	NP	VL		0	NEW		UTILITIES DEPT	2016	5	7	50	0.14	2	1	5	98.4	HIGH	\$2,175.00	\$305	
2	GATE VALVE	8DI	DI	ACTIVE		CAMP MAY RD	2009	NP	VL		0	NEW		UTILITIES DEPT	2016	4	7	50	0.14	2	1	5	78.8	LOW	\$1,975.00	\$277	
3	GATE VALVE	10DI	DI	ACTIVE		CAMP MAY RD	2009	NP	VL		0	NEW		UTILITIES DEPT	2016	3	7	50	0.14	2	1	5	59.1	LOW	\$2,175.00	\$305	
4	GATE VALVE	6DI	DI	ACTIVE		CAMP MAY RD	2009	NP	VL		0	NEW		UTILITIES DEPT	2016	2	7	50	0.14	2	1	5	39.4	LOW	\$1,025.00	\$144	
5	GATE VALVE	6DI	DI	ACTIVE		CAMP MAY RD	2009	NP	VL		0	NEW		UTILITIES DEPT	2016	1	7	50	0.14	2	1	5	19.7	LOW	\$1,025.00	\$144	
6	GATE VALVE	6DI	DI	ACTIVE		CAMP MAY RD	2009	NP	VL		0	NEW		UTILITIES DEPT	2016	5	7	50	0.14	2	1	5	98.4	HIGH	\$1,025.00	\$144	
7	GATE VALVE	6DI	DI	ACTIVE		CAMP MAY RD	2009	NP	VL		0	NEW		UTILITIES DEPT	2016	4	7	50	0.14	2	1	5	78.8	LOW	\$1,025.00	\$144	
8	GATE VALVE	6DI	DI	ACTIVE		CAMP MAY RD	2009	NP	VL		0	NEW		UTILITIES DEPT	2016	3	7	50	0.14	2	1	5	59.1	LOW	\$1,025.00	\$144	
9	GATE VALVE	8DI	DI	ACTIVE	397	CAMP MAY RD	2009	NP	VL		0	NEW		UTILITIES DEPT	2016	2	7	50	0.14	2	1	5	39.4	LOW	\$1,975.00	\$277	
10	GATE VALVE	8DI	DI	ACTIVE		CAMP MAY RD	2009	NP	VL		0	NEW		UTILITIES DEPT	2016	1	7	50	0.14	2	1	5	19.7	LOW	\$1,975.00	\$277	
11	GATE VALVE	10DI	DI	ACTIVE		CAMP MAY RD	2009	NP	VL		0	NEW		UTILITIES DEPT	2016	5	7	50	0.14	2	1	5	98.4	HIGH	\$2,175.00	\$305	
12	GATE VALVE	10DI	DI	ACTIVE		CAMP MAY RD	2009	NP	VL		0	NEW		UTILITIES DEPT	2015	4	7	50	0.14	2	2	5	157.5	LOW	\$2,175.00	\$305	
13	GATE VALVE	2CI	CI	INACTIVE			2008	NP	VL		0			LAPS	2015	3	8	50	0.16	2	2	5	135.0	LOW	\$1,025.00	\$164	
14	GATE VALVE	4CI	CI	INACTIVE			2008	NP	VL		0			UTILITIES DEPT	2015	2	8	50	0.16	2	2	5	90.0	LOW	\$1,025.00	\$164	

DPU Financial Policy for Cash Reserves

- In Each Utilities Sub Fund:
 - 180-Days Budgeted O&M Expenditures
 - Annuitized or Actual CIP Program Expenditures for the Following Year / OR / A Minimum Annual Depreciation Plus 2.5%
 - For the Analyses in This Report CIP Program Expenditures Were Approximately Equal to Annual Depreciation Plus 2.5%
 - Contingency Reserve (Single Largest Potential Failed Equipment)
 - Debt Service Reserve (Sufficient to Fund All Debt Service)
 - Retirement/Reclamation Reserve (Statutory, Contractual or Best Practice)
- Contingency Reserve
 - WP = \$750,000 Replace a Well House or Booster Station
 - DW = \$750,000 Replace a Water Tank
 - NP = \$750,000 Replace a Water Tank or Booster Station
- Retirement/Reclamation Reserve
 - WP = \$150,000 Abandon a Well House or Water Tank or Booster Station
 - DW = \$150,000 Abandon a Water Tank
 - NP = \$150,000 Abandon a Water Tank or Booster Station
- Cash Balance and Cost / Risk Sharing Between Water System Groups
 - Considered Very Unlikely that Multiple Contingencies Will Occur in Any One Year
 - DW and WP Group Budget for Contingency and Retirement/Reclamation Reserves are Split 50/50
 - NP is Embedded Within WP so NP Reserves are Considered Covered by WP Reserves

Discussion of Alternative Scenarios

- Predicated on the Annual Budget “Forecast” Spreadsheet Model
 - Expanded from 10-Years to 20-Years to Cover CIP “Catch Up’ Years
 - Added Some NP Values and Isolated/Highlighted Those NP Values
 - Added a “Recommended Cash Balance” Comparison to Calculated Cash Balance
 - Added Water Rates Estimates
 - Highlighted Certain Important Aspects
- Alternative One – “Baseline” Scenario
 - WP = Keep CIP at Historic Annual Values Until “Catch Up” Plus Proposed Wells
 - DW = Keep CIP at Historic Annual Values Until “Catch Up”
 - All Rates Increase 10% 2017 + 10% 2018 Then 1.5% thru 2036
- Alternative Two – “Accelerated DW CIP & Conservative WP CIP” Scenario
 - WP = Keep CIP at Historic Annual Values Until “Catch Up” Plus Proposed Wells
 - DW = Increase Annual CIP to \$1,000,000 per Year and “Catch Up” 3 Years Sooner
 - Rates Vary To Converge Calculated Cash Balance to “Recommended Cash Balance”
- Alternative Three – “Mellower DW Rate & Adjusted WP CIP” Scenario
 - WP = CIP Adjusted Lower for Well Construction Years and Increased for Other Years
 - DW = 2018 Rate Increase Lowered to 5.5% with Cash Reserves Slower to Match “Recommended Cash Reserve” Value
 - NP Rates Increased a Steady 3.15% for Full Coverage of O&M and R&R Costs by 2036

FIG 14 - Alt One – Water Distribution

Expense Forecast		ACTUAL	BUDGET	BUDGET	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST
		2016	2,017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
		1.50%																				
Supervision, Misc Direct Admin		221,273	182,979	187,328	190,138	192,990	195,885	198,823	201,805	204,833	207,905	211,024	214,189	217,402	220,663	223,973	227,332	230,742	234,203	237,717	241,282	244,902
Hydrants		71,088	58,860	59,924	60,823	61,735	62,661	63,601	64,555	65,523	66,506	67,504	68,517	69,544	70,587	71,646	72,721	73,812	74,919	76,043	77,183	78,341
Water Distribution		369,040	403,107	409,154	415,291	421,520	427,843	434,261	440,775	447,386	454,097	460,909	467,822	474,839	481,962	489,191	496,529	503,977	511,537	519,210	526,998	534,903
Water Meters		655,736	691,719	699,002	700,000	700,000	350,000	355,250	360,579	365,987	371,477	377,049	382,705	388,446	394,272	400,186	406,189	412,282	418,466	424,743	431,115	437,581
Interdepartmental Charges		225,566	251,649	251,649	255,424	259,255	263,144	267,091	271,097	275,164	279,291	283,481	287,733	292,049	296,430	300,876	305,389	309,970	314,620	319,339	324,129	328,991
Administrative Division Allocation		520,812	538,020	551,910	560,189	568,591	577,120	585,777	594,564	603,482	612,535	621,723	631,048	640,514	650,122	659,874	669,772	679,818	690,016	700,366	710,871	721,534
Cost of Water		2,528,096	2,705,409	2,705,409	2,745,990	2,787,180	2,828,987	2,871,422	2,914,494	2,958,211	3,002,584	3,047,623	3,093,337	3,139,737	3,186,833	3,234,636	3,283,155	3,332,403	3,382,389	3,433,125	3,484,621	3,536,891
Capital Annuity				-	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	500,000	500,000	500,000	500,000	500,000	500,000
Capital		443,092	0	-																		
Total Operation Expenses		4,591,611	4,831,743	4,864,375	4,927,854	4,991,272	4,705,641	4,776,225	4,847,869	4,920,587	4,994,396	5,069,312	5,145,351	5,222,532	5,300,870	5,380,383	5,461,088	5,543,005	5,626,150	5,710,542	5,796,200	5,883,143
Total Capital Expenditures		443,092	0	0	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	500,000	500,000	500,000	500,000	500,000	500,000
Total Expenditures		5,034,703	4,831,743	4,864,375	5,677,854	5,741,272	5,455,641	5,526,225	5,597,869	5,670,587	5,744,396	5,819,312	5,895,351	5,972,532	6,050,870	6,130,383	5,961,088	6,043,005	6,126,150	6,210,542	6,296,200	6,383,143
Revenue Forecast																						
kgal Sales		850,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000
Revenue per kgal		\$ 5.43	6 \$	6.57	\$ 6.67	\$ 6.77	\$ 6.87	\$ 6.97	\$ 7.08	\$ 7.18	\$ 7.29	\$ 7.40	\$ 7.51	\$ 7.63	\$ 7.74	\$ 7.86	\$ 7.97	\$ 8.09	\$ 8.21	\$ 8.34	\$ 8.46	\$ 8.59
Rate Increase Percentage		10.00%	10.00%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%
Total Sales Revenue		4,615,500	4,629,075	5,091,983	5,168,362	5,245,888	5,324,576	5,404,445	5,485,511	5,567,794	5,651,311	5,736,081	5,822,122	5,909,454	5,998,095	6,088,067	6,179,388	6,272,079	6,366,160	6,461,652	6,558,577	6,656,956
Interest on Utility Reserves		520,525	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Revenue on Recoverable Work		271,869	275,947	280,086	284,288	288,552	292,880	297,274	301,733	306,259	310,852	315,515	320,248	325,052	329,927	334,876	339,900	344,998	350,173	355,426	360,757	366,168
Bond Issue Proceeds																						
Total Cash Inflow from Operations		5,407,894	5,055,022	5,522,069	5,602,650	5,684,440	5,767,456	5,851,718	5,937,244	6,024,053	6,112,163	6,201,596	6,292,370	6,384,505	6,478,023	6,572,943	6,669,287	6,767,077	6,866,333	6,967,078	7,069,334	7,173,124
Net Cash Flow		373,191	223,279	657,694	(75,204)	(56,832)	311,815	325,493	339,375	353,466	367,768	382,284	397,018	411,974	427,153	442,561	708,199	724,072	740,183	756,536	773,134	789,981
Cumulative Net Cash Flow		373,191	596,471	1,254,164	1,178,960	1,122,128	1,433,944	1,759,437	2,098,812	2,452,277	2,820,045	3,202,329	3,599,348	4,011,321	4,438,475	4,881,035	5,589,234	6,313,306	7,053,490	7,810,025	8,583,159	9,373,140
Cash Balance		615,779	839,058	1,496,752	1,421,548	1,364,716	1,676,531	2,002,024	2,341,399	2,694,865	3,062,633	3,444,917	3,841,935	4,253,909	4,681,062	5,123,623	5,831,822	6,555,894	7,296,077	8,052,613	8,825,747	9,615,728
Recommended Cash Balance		1,513,167	1,529,483	2,290,932	2,302,046	2,138,327	2,152,402	2,166,688	2,181,188	2,195,906	2,210,844	2,226,007	2,241,397	2,257,018	2,272,873	2,038,966	2,055,301	2,071,880	2,088,709	2,105,789	2,123,126	2,140,723
Alter. One Retail (DW) Water Rates / kgal																						
Residential Tier 1 - < 9,000 gals		\$4.19	5	\$5.07	\$5.15	\$5.22	\$5.30	\$5.38	\$5.46	\$5.54	\$5.63	\$5.71	\$5.80	\$5.88	\$5.97	\$6.06	\$6.15	\$6.24	\$6.34	\$6.43	\$6.53	\$6.63
Residential Tier 2 - 9 to 15,000 gals		\$4.45	5	\$5.38	\$5.47	\$5.55	\$5.63	\$5.71	\$5.80	\$5.89	\$5.98	\$6.07	\$6.16	\$6.25	\$6.34	\$6.44	\$6.53	\$6.63	\$6.73	\$6.83	\$6.94	\$7.04
Residential Tier 3 - > 15,000 gals		\$5.32	6	\$6.44	\$6.53	\$6.63	\$6.73	\$6.83	\$6.93	\$7.04	\$7.14	\$7.25	\$7.36	\$7.47	\$7.58	\$7.70	\$7.81	\$7.93	\$8.05	\$8.17	\$8.29	\$8.42
Multi-Family Tier 1 - < 9,000 gals		\$4.19	5	\$5.07	\$5.15	\$5.22	\$5.30	\$5.38	\$5.46	\$5.54	\$5.63	\$5.71	\$5.80	\$5.88	\$5.97	\$6.06	\$6.15	\$6.24	\$6.34	\$6.43	\$6.53	\$6.63
Multi-Family Tier 2 - 9 to 15,000 gals		\$4.40	5	\$5.32	\$5.40	\$5.48	\$5.57	\$5.65	\$5.74	\$5.82	\$5.91	\$6.00	\$6.09	\$6.18	\$6.27	\$6.37	\$6.46	\$6.56	\$6.66	\$6.76	\$6.86	\$6.96
Multi-Family Tier 3 - > 15,000 gals		\$4.50	5	\$5.45	\$5.53	\$5.61	\$5.69	\$5.78	\$5.87	\$5.95	\$6.04	\$6.13	\$6.23	\$6.32	\$6.41	\$6.51	\$6.61	\$6.71	\$6.81	\$6.91	\$7.01	\$7.12
Commercial All Tiers		\$4.61	5	\$5.58	\$5.66	\$5.75	\$5.83	\$5.92	\$6.01	\$6.10	\$6.19	\$6.28	\$6.38	\$6.47	\$6.57	\$6.67	\$6.77	\$6.87	\$6.97	\$7.08	\$7.18	\$7.29
County & Schools All Tiers		\$4.61	5	\$5.58	\$5.66	\$5.75	\$5.83	\$5.92	\$6.01	\$6.10	\$6.19	\$6.28	\$6.38	\$6.47	\$6.57	\$6.67	\$6.77	\$6.87	\$6.97	\$7.08	\$7.18	\$7.29
Customer Charge per Meter Size																						
= or < 1.25"		\$7.93	9	\$9.60	\$9.74	\$9.89	\$10.03	\$10.18	\$10.34	\$10.49	\$10.65	\$10.81	\$10.97	\$11.14	\$11.30	\$11.47	\$11.64	\$11.82	\$12.00	\$12.18	\$12.36	\$12.54
1.5"		\$25.12	28	\$30.40	\$30.85	\$31.31	\$31.78	\$32.26	\$32.74	\$33.24	\$33.73	\$34.24	\$34.75	\$35.27	\$35.80	\$36.34	\$36.89	\$37.44	\$38.00	\$38.57	\$39.15	\$39.74
2"		\$37.50	41	\$45.38	\$46.06	\$46.75	\$47.45	\$48.16	\$48.88	\$49.61	\$50.36	\$51.11	\$51.88	\$52.66	\$53.45	\$54.25	\$55.06	\$55.89	\$56.73	\$57.58	\$58.44	\$59.32
2.5" to 3"		\$74.00	81	\$89.54	\$90.88	\$92.25	\$93.63	\$95.03	\$96.46	\$97.91	\$99.38	\$100.87	\$102.38	\$103.91	\$105.47	\$107.06	\$108.66	\$110.29	\$111.95	\$113.62	\$115.33	\$117.06
4"		\$126.00	139	\$152.46	\$154.75	\$157.07	\$159.42	\$161.82	\$164.24	\$166.71	\$169.21	\$171.75	\$174.32	\$176.94	\$179.59	\$182.28	\$185.02	\$187.79	\$190.61	\$193.47	\$196.37	\$199.32
6"		\$266.00	293	\$321.86	\$326.69	\$331.59	\$336.56	\$341.61	\$346.73	\$351.94	\$357.21	\$362.57	\$368.01	\$373.53	\$379.13	\$384.82	\$390.59	\$396.45	\$402.40	\$408.44	\$414.56	\$420.78
8"		\$439.50	483	\$531.80	\$539.77	\$547.87	\$556.09	\$564.43	\$572.89	\$581.49	\$590.21	\$599.06	\$608.05	\$617.17	\$626.43	\$635.82	\$645.36	\$655.04	\$664.87	\$674.84	\$684.96	\$695.24

FIG 15 - Alt One – Water Production

		ACTUAL	BUDGET	BUDGET	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	
Expense Forecast		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	
	1.50%																						
Supervision and Operations		957,506	975,822	990,459	1,005,316	1,020,396	1,035,702	1,051,237	1,067,006	1,083,011	1,099,256	1,115,745	1,132,481	1,149,468	1,166,711	1,184,211	1,201,974	1,220,004	1,238,304	1,256,879	1,275,732	1,294,868	
Pumping Power		522,501	800,000	812,000	824,180	836,543	849,091	861,827	874,755	887,876	901,194	914,712	928,433	942,359	956,495	970,842	985,405	1,000,186	1,015,188	1,030,416	1,045,873	1,061,561	
Wells		83,059	137,508	139,571	141,664	143,789	145,946	148,135	150,357	152,613	154,902	157,225	159,584	161,977	164,407	166,873	169,376	171,917	174,496	177,113	179,770	182,466	
Booster Pump Stations		121,154	125,236	127,115	129,021	130,957	132,921	134,915	136,938	138,993	141,077	143,194	145,341	147,522	149,734	151,980	154,260	156,574	158,923	161,307	163,726	166,182	
Treatment		42,144	105,199	106,777	108,379	110,004	111,654	113,329	115,029	116,755	118,506	120,283	122,088	123,919	125,778	127,665	129,579	131,523	133,496	135,498	137,531	139,594	
Storage Tanks		20,317	19,600	19,894	20,192	20,495	20,803	21,115	21,431	21,753	22,079	22,410	22,747	23,088	23,434	23,786	24,142	24,505	24,872	25,245	25,624	26,008	
Transmission Lines		54,999	65,509	66,492	67,489	68,501	69,529	70,572	71,630	72,705	73,795	74,902	76,026	77,166	78,324	79,499	80,691	81,901	83,130	84,377	85,643	86,927	
Non Potable System		176,711	642,187	372,422	300,000	300,000	315,000	315,000	319,725	324,521	329,389	334,330	339,344	344,435	349,601	354,845	360,168	365,570	371,054	376,620	382,269	388,003	
Interdepartmental Charges		227,774	263,893	267,851	271,869	275,947	280,086	284,288	288,552	292,880	297,274	301,733	306,259	310,852	315,515	320,248	325,052	329,927	334,876	339,900	344,998	350,173	
Administrative Division Allocation		521,533	505,254	512,833	520,525	528,333	536,258	544,302	552,467	560,754	569,165	577,702	586,368	595,163	604,091	613,152	622,350	631,685	641,160	650,777	660,539	670,447	
State Water Tax		34,855	45,000	45,675	46,360	47,056	47,761	48,478	49,205	49,943	50,692	51,453	52,224	53,008	53,803	54,610	55,429	56,260	57,104	57,961	58,830	59,713	
	10.0%																						
Debt Service		222,382	254,182	309,021	339,924	373,916	411,308	452,438	497,682	547,450	602,195	662,415	672,351	682,436	692,673	703,063	713,609	724,313	735,178	746,205	757,399	768,760	
Capital Annuity - NP R&R & CIP				127,000	129,000	160,000	165,000	187,000	187,000	195,000	201,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	
Capital Annuity - WP CIP & R&R			-	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	
Capital - WP CIP		1,937,194	3,000,000					3,000,000				3,000,000					3,000,000					3,000,000	
Capital Paid with Debt/Grants		550,000	483,300	712,500	618,750	825,000	975,000	562,500	487,500	693,750	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	
Capital Paid with Reserves																							
Total Operation Expenses		2,984,935	3,939,390	3,770,110	3,774,920	3,855,937	3,956,059	4,045,636	4,144,778	4,249,253	4,359,525	4,476,104	4,543,246	4,611,394	4,680,565	4,750,774	4,822,035	4,894,366	4,967,781	5,042,298	5,117,933	5,194,702	
Total Capital Expenditures		1,937,194	3,000,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	
Total Cash Outflow		4,922,129	6,939,390	5,270,110	5,274,920	5,355,937	5,456,059	8,545,636	5,644,778	5,749,253	8,859,525	5,976,104	6,043,246	6,111,394	6,180,565	9,250,774	5,572,035	5,644,366	5,717,781	5,792,298	5,867,933	8,944,702	
Revenue Forecast																							
Production in thousand gallons (NP)			84,500	86,400	86,400	90,400	90,400	94,500	94,500	108,600	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	
Revenue per thousand gallons (NP)		\$ 1.15	\$ 1.15	\$ 2.50	\$ 2.54	\$ 2.58	\$ 2.61	\$ 2.65	\$ 2.69	\$ 2.73	\$ 2.77	\$ 2.82	\$ 2.86	\$ 2.90	\$ 2.94	\$ 2.99	\$ 3.03	\$ 3.08	\$ 3.13	\$ 3.17	\$ 3.22	\$ 3.27	
Rate Increase Percentage				117.00%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	
Total Sales Revenue (NP)		\$ 97,175	\$ 99,360	\$ 216,000	\$ 229,390	\$ 232,831	\$ 247,042	\$ 250,747	\$ 292,483	\$ 373,138	\$ 378,735	\$ 384,416	\$ 390,182	\$ 396,035	\$ 401,975	\$ 408,005	\$ 414,125	\$ 420,337	\$ 426,642	\$ 433,041	\$ 439,537	\$ 446,130	
Production in thousand gallons		1,250,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	
Revenue per thousand gallons		\$ 2.89	\$ 3.17	\$ 3.49	\$ 3.54	\$ 3.60	\$ 3.65	\$ 3.71	\$ 3.76	\$ 3.82	\$ 3.87	\$ 3.93	\$ 3.99	\$ 4.05	\$ 4.11	\$ 4.17	\$ 4.24	\$ 4.30	\$ 4.36	\$ 4.43	\$ 4.50	\$ 4.56	
Rate Increase Percentage		10.00%	10.00%	10.00%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	
Total Sales Revenue		3,606,504	3,649,525	4,014,478	4,074,695	4,135,815	4,197,852	4,260,820	4,324,732	4,389,603	4,455,447	4,522,279	4,590,113	4,658,965	4,728,850	4,799,782	4,871,779	4,944,856	5,019,029	5,094,314	5,170,729	5,248,290	
Interest on Inter-Utility Loans		182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	
Interest on Utility Reserves		200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	
Other Revenue		90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	
Bond Federal Subsidy		27,576	27,576	27,576	27,576	27,576	27,576	27,576	27,576	21,338	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940	
Federal or State Grant/Loan		550,000	483,300	712,500	618,750	825,000	975,000	562,500	487,500	693,750	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	
Inter-Utility Loan																							
Total Cash Inflow		4,753,361	4,731,867	5,442,660	5,422,517	5,693,328	5,919,576	5,573,749	5,604,397	5,949,935	5,696,228	5,768,740	5,842,341	5,917,045	5,992,870	6,069,833	6,147,949	6,227,238	6,307,716	6,389,401	6,472,311	6,556,465	
Net Cash Flow		(168,768)	(2,07,523)	172,550	147,597	337,391	463,517	(2,971,887)	(40,381)	200,682	(3,163,297)	(207,364)	(200,905)	(194,349)	(187,695)	(3,180,941)	575,914	582,872	589,934	597,103	604,379	(2,388,236)	
Cumulative Net Cash Flow		(168,768)	(2,376,291)	(2,203,741)	(2,056,144)	(1,718,754)	(1,255,237)	(4,227,124)	(4,267,505)	(4,066,823)	(7,230,120)	(7,437,483)	(7,638,388)	(7,832,737)	(8,020,433)	(11,201,374)	(10,625,460)	(10,042,588)	(9,452,653)	(8,855,551)	(8,251,172)	(10,639,408)	
Cash Balance		10,362,736	8,155,213	8,327,763	8,475,360	8,812,750	9,276,267	6,304,380	6,263,999	6,464,681	3,301,384	3,094,021	2,893,116	2,698,767	2,511,071	(669,870)	(93,956)	488,916	1,078,851	1,675,953	2,280,332	(107,904)	
Recommended Cash Balance		5,673,786	4,118,566	4,167,422	4,229,927	4,320,683	7,386,037	4,466,230	4,549,351	7,640,860	4,729,259	4,767,798	4,806,915	4,846,619	7,886,918	4,177,822	4,219,339						

FIG 16 - Alt Two – Water Distribution

Expense Forecast		ACTUAL	BUDGET	BUDGET	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
		1.50%																				
Supervision, Misc Direct Admin		221,273	182,979	187,328	190,138	192,990	195,885	198,823	201,805	204,833	207,905	211,024	214,189	217,402	220,663	223,973	227,332	230,742	234,203	237,717	241,282	244,902
Hydrants		71,088	58,860	59,924	60,823	61,735	62,661	63,601	64,555	65,523	66,506	67,504	68,517	69,544	70,587	71,646	72,721	73,812	74,919	76,043	77,183	78,341
Water Distribution		369,040	403,107	409,154	415,291	421,520	427,843	434,261	440,775	447,386	454,097	460,909	467,822	474,839	481,962	489,191	496,529	503,977	511,537	519,210	526,998	534,903
Water Meters		655,736	691,719	699,002	700,000	700,000	350,000	355,250	360,579	365,987	371,477	377,049	382,705	388,446	394,272	400,186	406,189	412,282	418,466	424,743	431,115	437,581
Interdepartmental Charges		225,566	251,649	251,649	255,424	259,255	263,144	267,091	271,097	275,164	279,291	283,481	287,733	292,049	296,430	300,876	305,389	309,970	314,620	319,339	324,129	328,991
Administrative Division Allocation		520,812	538,020	551,910	560,189	568,591	577,120	585,777	594,564	603,482	612,535	621,723	631,048	640,514	650,122	659,874	669,772	679,818	690,016	700,366	710,871	721,534
Cost of Water		2,528,096	2,459,463	2,705,409	2,745,990	2,787,180	2,828,987	2,871,422	2,914,484	2,958,211	3,002,584	3,047,623	3,093,337	3,139,737	3,186,833	3,234,636	3,283,155	3,332,403	3,382,389	3,433,125	3,484,621	3,536,891
Capital Annuity				1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000
Capital		443,092	-	-																		
Total Operation Expenses		4,591,611	4,585,797	4,864,375	4,927,854	4,991,272	4,705,641	4,776,225	4,847,869	4,920,587	4,994,396	5,069,312	5,145,351	5,222,532	5,300,870	5,380,383	5,461,088	5,543,005	5,626,150	5,710,542	5,796,200	5,883,143
Total Capital Expenditures		443,092	0	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	1,000,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000	500,000
Total Expenditures		5,034,703	4,585,797	5,864,375	5,927,854	5,991,272	5,705,641	5,776,225	5,847,869	5,920,587	5,994,396	6,069,312	6,145,351	5,722,532	5,800,870	5,880,383	5,961,088	6,043,005	6,126,150	6,210,542	6,296,200	6,383,143
Revenue Forecast																						
kgal Sales		850,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000
Revenue per kgal		\$ 5.43	\$ 5.97	\$ 6.57	\$ 6.90	\$ 7.00	\$ 7.11	\$ 7.21	\$ 7.32	\$ 7.43	\$ 7.54	\$ 7.66	\$ 7.01	\$ 7.01	\$ 7.01	\$ 7.01	\$ 7.08	\$ 7.18	\$ 7.29	\$ 7.40	\$ 7.51	\$ 7.62
Rate Increase Percentage		10.00%	10.00%	5.00%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	-8.50%	0.00%	0.00%	0.00%	1.00%	1.50%	1.50%	1.50%	1.50%	1.50%
Total Sales Revenue		4,615,500	4,629,075	5,091,983	5,346,582	5,426,780	5,508,182	5,590,805	5,674,667	5,759,787	5,846,184	5,933,876	5,429,497	5,429,497	5,429,497	5,429,497	5,483,792	5,566,049	5,649,540	5,734,283	5,820,297	5,907,601
Interest on Utility Reserves		520,525	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000
Revenue on Recoverable Work		271,869	275,947	280,086	284,288	288,552	292,880	297,274	301,733	306,259	310,852	315,515	320,248	325,052	329,927	334,876	339,900	344,998	350,173	355,426	360,757	366,168
Bond Issue Proceeds																						
Total Cash Inflow from Operations		5,407,894	5,055,022	5,522,069	5,780,869	5,865,332	5,951,062	6,038,078	6,126,399	6,216,045	6,307,036	6,399,392	5,899,745	5,904,549	5,909,424	5,914,373	5,973,691	6,061,047	6,149,713	6,239,708	6,331,054	6,423,770
Net Cash Flow		373,191	469,226	(342,306)	(146,985)	(125,939)	245,422	261,853	278,531	295,459	312,640	330,080	(245,606)	182,017	108,555	33,991	12,603	18,042	23,563	29,166	34,854	40,627
Cumulative Net Cash Flow		373,191	842,417	500,111	353,126	227,187	472,608	734,461	1,012,992	1,308,450	1,621,091	1,951,171	1,705,564	1,887,582	1,996,136	2,030,127	2,042,730	2,060,773	2,084,335	2,113,502	2,148,355	2,188,982
Cash Balance		615,779	1,085,005	742,698	595,714	469,774	715,196	977,049	1,255,579	1,551,038	1,863,678	2,193,758	1,948,152	2,130,169	2,238,724	2,272,715	2,285,318	2,303,360	2,326,923	2,356,089	2,390,943	2,431,569
Recommended Cash Balance		1,513,167	2,529,483	2,540,932	2,552,046	2,388,327	2,402,402	2,416,688	2,431,188	2,445,906	2,460,844	2,476,007	1,991,397	2,007,018	2,022,873	2,038,966	2,055,301	2,071,880	2,088,705	2,105,789	2,123,126	2,140,723
Alter, One Retail (DW) Water Rates / kgal																						
Residential Tier 1 - < 9,000 gals		\$4.19	\$4.61	\$5.07	\$5.32	\$5.40	\$5.48	\$5.57	\$5.65	\$5.73	\$5.82	\$5.91	\$5.41	\$5.41	\$5.41	\$5.41	\$5.46	\$5.54	\$5.63	\$5.71	\$5.80	\$5.88
Residential Tier 2 - 9 to 15,000 gals		\$4.45	\$4.90	\$5.38	\$5.65	\$5.74	\$5.82	\$5.91	\$6.00	\$6.09	\$6.18	\$6.27	\$5.74	\$5.74	\$5.74	\$5.74	\$5.80	\$5.89	\$5.97	\$6.06	\$6.15	\$6.25
Residential Tier 3 - > 15,000 gals		\$5.32	\$5.85	\$6.44	\$6.76	\$6.86	\$6.96	\$7.07	\$7.17	\$7.28	\$7.39	\$7.50	\$6.86	\$6.86	\$6.86	\$6.86	\$6.93	\$7.04	\$7.14	\$7.25	\$7.36	\$7.47
Multi-Family Tier 1 - < 9,000 gals		\$4.19	\$4.61	\$5.07	\$5.32	\$5.40	\$5.48	\$5.57	\$5.65	\$5.73	\$5.82	\$5.91	\$5.41	\$5.41	\$5.41	\$5.41	\$5.46	\$5.54	\$5.63	\$5.71	\$5.80	\$5.88
Multi-Family Tier 2 - 9 to 15,000 gals		\$4.40	\$4.84	\$5.32	\$5.59	\$5.67	\$5.76	\$5.85	\$5.93	\$6.02	\$6.11	\$6.20	\$5.68	\$5.68	\$5.68	\$5.68	\$5.73	\$5.82	\$5.91	\$6.00	\$6.09	\$6.18
Multi-Family Tier 3 - > 15,000 gals		\$4.50	\$4.95	\$5.45	\$5.72	\$5.80	\$5.89	\$5.98	\$6.07	\$6.16	\$6.25	\$6.35	\$5.81	\$5.81	\$5.81	\$5.81	\$5.86	\$5.95	\$6.04	\$6.13	\$6.22	\$6.32
Commercial All Tiers		\$4.61	\$5.07	\$5.58	\$5.86	\$5.94	\$6.03	\$6.12	\$6.22	\$6.31	\$6.40	\$6.50	\$5.95	\$5.95	\$5.95	\$5.95	\$6.01	\$6.10	\$6.19	\$6.28	\$6.38	\$6.47
County & Schools All Tiers		\$4.61	\$5.07	\$5.58	\$5.86	\$5.94	\$6.03	\$6.12	\$6.22	\$6.31	\$6.40	\$6.50	\$5.95	\$5.95	\$5.95	\$5.95	\$6.01	\$6.10	\$6.19	\$6.28	\$6.38	\$6.47
Customer Charge per Meter Size																						
= or < 1.25"		\$7.93	\$8.72	\$9.60	\$10.08	\$10.23	\$10.38	\$10.54	\$10.69	\$10.85	\$11.02	\$11.18	\$10.23	\$10.23	\$10.23	\$10.23	\$10.33	\$10.49	\$10.65	\$10.81	\$10.97	\$11.13
1.5"		\$25.12	\$27.63	\$30.40	\$31.91	\$32.39	\$32.88	\$33.37	\$33.87	\$34.38	\$34.90	\$35.42	\$32.41	\$32.41	\$32.41	\$32.41	\$32.73	\$33.23	\$33.72	\$34.23	\$34.74	\$35.26
2"		\$37.50	\$41.25	\$45.38	\$47.64	\$48.36	\$49.08	\$49.82	\$50.57	\$51.33	\$52.10	\$52.88	\$48.38	\$48.38	\$48.38	\$48.38	\$48.87	\$49.60	\$50.34	\$51.10	\$51.87	\$52.64
2.5" to 3"		\$74.00	\$81.40	\$89.54	\$94.02	\$95.43	\$96.86	\$98.31	\$99.79	\$101.28	\$102.80	\$104.34	\$95.48	\$95.48	\$95.48	\$95.48	\$96.43	\$97.88	\$99.34	\$100.83	\$102.35	\$103.88
4"		\$126.00	\$138.60	\$152.46	\$160.08	\$162.48	\$164.92	\$167.40	\$169.91	\$172.45	\$175.04	\$177.67	\$162.57	\$162.57	\$162.57	\$162.57	\$164.19	\$166.65	\$169.15	\$171.69	\$174.27	\$176.88
6"		\$266.00	\$292.60	\$321.86	\$337.95	\$343.02	\$348.17	\$353.39	\$358.69	\$364.07	\$369.53	\$375.08	\$343.19	\$343.19	\$343.19	\$343.19	\$346.63	\$351.83	\$357.10	\$362.46	\$367.90	\$373.41
8"		\$439.50	\$483.45	\$531.80	\$558.38	\$566.76	\$575.26	\$583.89	\$592.65	\$601.54	\$610.56	\$619.72	\$567.04	\$567.04	\$567.04	\$567.04	\$572.71	\$581.31	\$590.02	\$598.88	\$607.86	\$616.98

FIG 17 - Alt Two – Water Production

		ACTUAL	BUDGET	BUDGET	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST
Expense Forecast		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	1.50%																					
Supervision and Operations		957,506	975,822	990,459	1,005,316	1,020,396	1,035,702	1,051,237	1,067,006	1,083,011	1,099,256	1,115,745	1,132,481	1,149,468	1,166,711	1,184,211	1,201,974	1,220,004	1,238,304	1,256,879	1,275,732	1,294,868
Pumping Power		522,501	800,000	812,000	824,180	836,543	849,091	861,827	874,755	887,876	901,194	914,712	928,433	942,359	956,495	970,842	985,405	1,000,186	1,015,188	1,030,416	1,045,873	1,061,561
Wells		83,059	137,508	139,571	141,664	143,789	145,946	148,135	150,357	152,613	154,902	157,225	159,584	161,977	164,407	166,873	169,376	171,917	174,496	177,113	179,770	182,466
Booster Pump Stations		121,154	125,236	127,115	129,021	130,957	132,921	134,915	136,938	138,993	141,077	143,194	145,341	147,522	149,734	151,980	154,260	156,574	158,923	161,307	163,726	166,182
Treatment		42,144	105,199	106,777	108,379	110,004	111,654	113,329	115,029	116,755	118,506	120,283	122,088	123,919	125,778	127,665	129,579	131,523	133,496	135,498	137,531	139,594
Storage Tanks		20,317	19,600	19,894	20,192	20,495	20,803	21,115	21,431	21,753	22,079	22,410	22,747	23,088	23,434	23,786	24,142	24,505	24,872	25,245	25,624	26,008
Transmission Lines		54,999	65,509	66,492	67,489	68,501	69,529	70,572	71,630	72,705	73,795	74,902	76,026	77,166	78,324	79,499	80,691	81,901	83,130	84,377	85,643	86,927
Non Potable System		176,711	642,187	372,422	300,000	300,000	315,000	315,000	319,725	324,521	329,389	334,330	339,344	344,435	349,601	354,845	360,168	365,570	371,054	376,620	382,269	388,003
Interdepartmental Charges		227,774	263,893	267,851	271,869	275,947	280,086	284,288	288,552	292,880	297,274	301,733	306,259	310,852	315,515	320,248	325,052	329,927	334,876	339,900	344,998	350,173
Administrative Division Allocation		521,533	505,254	512,833	520,525	528,333	536,258	544,302	552,467	560,754	569,165	577,702	586,368	595,163	604,091	613,152	622,350	631,685	641,160	650,777	660,539	670,447
State Water Tax		34,855	45,000	45,675	46,360	47,056	47,761	48,478	49,205	49,943	50,692	51,453	52,224	53,008	53,803	54,610	55,429	56,260	57,104	57,961	58,830	59,713
	10.0%																					
Debt Service		222,382	254,182	309,021	339,924	373,916	411,308	452,438	497,682	547,450	602,195	662,415	672,351	682,436	692,673	703,063	713,609	724,313	735,178	746,205	757,399	768,760
Capital Annuity - NP R&R			127,000	129,000	160,000	165,000	187,000	187,000	195,000	201,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000
Capital Annuity - WP CIP & R&R			-	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	1,500,000	750,000	750,000	750,000	750,000	750,000	750,000
Capital - WP CIP		1,937,194	3,000,000					3,000,000				3,000,000				3,000,000						3,000,000
Capital Paid with Debt/Grants		550,000	483,300	712,500	618,750	825,000	975,000	562,500	487,500	693,750	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000
Capital Paid with Reserves																						
Total Operation Expenses		2,984,935	3,939,390	3,770,110	3,774,920	3,855,937	3,956,059	4,045,636	4,144,778	4,249,253	4,359,525	4,476,104	4,543,246	4,611,394	4,680,565	4,750,774	4,822,035	4,894,366	4,967,781	5,042,298	5,117,933	5,194,702
Total Capital Expenditures		1,937,194	3,000,000	1,500,000	1,500,000	1,500,000	1,500,000	4,500,000	1,500,000	1,500,000	1,500,000	4,500,000	1,500,000	1,500,000	1,500,000	4,500,000	750,000	750,000	750,000	750,000	750,000	3,750,000
Total Cash Outflow		4,922,129	6,939,390	5,270,110	5,274,920	5,355,937	5,456,059	8,545,636	5,644,778	5,749,253	5,859,525	8,976,104	6,043,246	6,111,394	6,180,565	9,250,774	5,572,035	5,644,366	5,717,781	5,792,298	5,867,933	8,944,702
Revenue Forecast																						
Production in thousand gallons (NP)		84,500	86,400	86,400	90,400	90,400	94,500	94,500	108,600	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500
Revenue per thousand gallons (NP)		\$ 1.15	\$ 1.15	\$ 2.50	\$ 2.56	\$ 2.63	\$ 2.69	\$ 2.76	\$ 2.83	\$ 2.90	\$ 2.97	\$ 3.05	\$ 3.12	\$ 3.20	\$ 3.28	\$ 3.36	\$ 3.41	\$ 3.46	\$ 3.50	\$ 3.55	\$ 3.59	\$ 3.64
Rate Increase Percentage				117.00%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	1.50%	1.50%	1.00%	1.50%	1.00%	1.50%
Total Sales Revenue (NP)		\$ 97,175	\$ 99,360	\$ 216,000	\$ 231,650	\$ 237,441	\$ 254,415	\$ 260,776	\$ 307,177	\$ 395,745	\$ 405,639	\$ 415,780	\$ 426,174	\$ 436,829	\$ 447,750	\$ 458,943	\$ 465,827	\$ 472,815	\$ 477,543	\$ 484,706	\$ 489,553	\$ 496,897
Production in thousand gallons		1,250,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000
Revenue per thousand gallons		\$ 2.89	\$ 3.17	\$ 3.49	\$ 3.58	\$ 3.67	\$ 3.76	\$ 3.85	\$ 3.95	\$ 4.05	\$ 4.15	\$ 4.25	\$ 4.36	\$ 4.47	\$ 4.58	\$ 4.69	\$ 4.82	\$ 4.93	\$ 4.43	\$ 4.49	\$ 4.54	\$ 4.61
Rate Increase Percentage		10.00%	10.00%	10.00%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	2.50%	-8.00%	1.50%	1.00%	1.50%	1.00%	1.50%
Total Sales Revenue		3,606,504	3,649,525	4,014,478	4,114,839	4,217,710	4,323,153	4,431,232	4,542,013	4,655,563	4,771,952	4,891,251	5,013,532	5,138,871	5,267,342	5,399,026	4,967,104	5,041,610	5,092,027	5,168,407	5,220,091	5,298,392
Interest on Inter-Utility Loans		182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106
Interest on Utility Reserves		200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Other Revenue		90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000
Bond Federal Subsidy		27,576	27,576	27,576	27,576	27,576	27,576	27,576	27,576	21,338	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940
Federal or State Grant/Loan		550,000	483,300	712,500	618,750	825,000	975,000	562,500	487,500	693,750	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000
Inter-Utility Loan																						
Total Cash Inflow		4,753,361	4,731,867	5,442,660	5,464,921	5,779,834	6,052,251	5,754,190	5,836,372	6,238,502	6,039,637	6,169,077	6,301,752	6,437,745	6,577,138	6,720,015	6,294,977	6,376,471	6,431,615	6,515,159	6,571,690	6,657,334
Net Cash Flow		(168,768)	(2,207,523)	172,550	190,002	423,896	596,192	(2,791,446)	191,594	489,250	180,112	(2,807,028)	258,507	326,351	396,572	(2,530,759)	722,942	732,105	713,834	722,861	703,757	(2,287,367)
Cumulative Net Cash Flow		(168,768)	(2,376,291)	(2,203,741)	(2,013,740)	(1,589,843)	(993,652)	(3,785,098)	(3,593,504)	(3,104,254)	(2,924,142)	(5,731,169)	(5,472,663)	(5,146,312)	(4,749,740)	(7,280,499)	(6,557,557)	(5,825,452)	(5,111,618)	(4,388,758)	(3,685,000)	(5,972,368)
Cash Balance		10,362,736	8,155,213	8,327,763	8,517,764	8,941,661	9,537,852	6,746,406	6,938,000	7,427,250	7,607,362	4,800,335	5,058,841	5,385,192	5,781,764	3,251,005	3,973,947	4,706,052	5,419,886	6,142,746	6,846,504	4,559,136
Recommended Cash Balance		5,673,786	4,118,566	4,167,422	4,229,927	4,320,683	7,386,037	4,466,230	4,549,351	7,640,860	4,729,259	4,767,798	4,806,915	4,846,619	7,886,918	4,177,822	4,219,339	4,261,480	4,304,252	4,347,666	7,391,731	4,436,456
Alter. One Wholesale (WP) Water Rates / kgal																						
		\$2.89	\$3.17	\$3.49	\$3.58	\$3.67	\$3.76	\$3.85	\$3.95	\$4.05	\$4.15	\$4.25	\$4.36	\$4.47	\$4.58	\$4						

FIG 18 - Alt Three – Water Distribution

Expense Forecast		ACTUAL	BUDGET	BUDGET	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST
		2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
	1.50%																					
Supervision, Misc Direct Admin		221,273	182,979	187,328	190,138	192,990	195,885	198,823	201,805	204,833	207,905	211,024	214,189	217,402	220,663	223,973	227,332	230,742	234,203	237,717	241,282	244,902
Hydrants		71,088	58,860	59,924	60,823	61,735	62,661	63,601	64,555	65,523	66,506	67,504	68,517	69,544	70,587	71,646	72,721	73,812	74,919	76,043	77,183	78,341
Water Distribution		369,040	403,107	409,154	415,291	421,520	427,843	434,261	440,775	447,386	454,097	460,909	467,822	474,839	481,962	489,191	496,529	503,977	511,537	519,210	526,998	534,903
Water Meters		655,736	691,719	699,002	700,000	700,000	350,000	355,250	360,579	365,987	371,477	377,049	382,705	388,446	394,272	400,186	406,189	412,282	418,466	424,743	431,115	437,581
Interdepartmental Charges		225,566	251,649	251,649	255,424	259,255	263,144	267,091	271,097	275,164	279,291	283,481	287,733	292,049	296,430	300,876	305,389	309,970	314,620	319,339	324,129	328,991
Administrative Division Allocation		520,812	538,020	551,910	560,189	568,591	577,120	585,777	594,564	603,482	612,535	621,723	631,048	640,514	650,122	659,874	669,772	679,818	690,016	700,366	710,871	721,534
Cost of Water		2,528,096	2,459,463	2,705,409	2,745,990	2,787,180	2,828,987	2,871,422	2,914,494	2,958,211	3,002,584	3,047,623	3,093,337	3,139,737	3,186,833	3,234,636	3,283,155	3,332,403	3,382,389	3,433,125	3,484,621	3,536,891

Capital Annuity		750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	500,000	500,000	500,000	500,000	500,000	500,000
Capital	443,092																				
Total Operation Expenses	4,591,611	4,585,797	4,864,375	4,927,854	4,991,272	4,705,641	4,776,225	4,847,869	4,920,587	4,994,396	5,069,312	5,145,351	5,222,532	5,300,870	5,380,383	5,461,088	5,543,005	5,626,150	5,710,542	5,796,200	5,883,143
Total Capital Expenditures	443,092	0	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	750,000	500,000	500,000	500,000	500,000	500,000	500,000
Total Expenditures	5,034,703	4,585,797	5,614,375	5,677,854	5,741,272	5,455,641	5,526,225	5,597,869	5,670,587	5,744,396	5,819,312	5,895,351	5,972,532	6,050,870	6,130,383	5,961,088	6,043,005	6,126,150	6,210,542	6,296,200	6,383,143

Revenue Forecast																																										
Legal Sales			850,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000	775,000																				
Revenue per kgal	\$	5.43	\$	5.97	\$	6.30	\$	6.46	\$	6.62	\$	6.79	\$	6.89	\$	6.99	\$	7.10	\$	7.20	\$	7.31	\$	7.42	\$	7.53	\$	7.64	\$	7.76	\$	7.98	\$	6.98	\$	6.98	\$	7.05	\$	7.12	\$	7.19
Rate Increase Percentage			10.00%	5.50%	2.50%	2.50%	2.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	1.50%	-10.00%	0.00%	0.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%		
Total Sales Revenue		4,615,500	4,629,075	4,883,674	5,005,766	5,130,910	5,259,183	5,338,071	5,418,142	5,499,414	5,581,905	5,665,634	5,750,618	5,836,877	5,924,431	6,013,297	5,411,967	5,411,967	5,411,967	5,466,087	5,520,748	5,575,955																				
Interest on Utility Reserves		520,525	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000	150,000																				
Revenue on Recoverable Work		271,869	275,947	280,086	284,288	288,552	292,880	297,274	301,733	306,259	310,852	315,515	320,248	325,052	329,927	334,876	339,900	344,998	350,173	355,426	360,757	366,168																				

Bond Issue Proceeds																					
Total Cash Inflow from Operations	5,407,894	5,055,022	5,313,761	5,440,054	5,569,462	5,702,063	5,785,344	5,869,874	5,955,672	6,042,757	6,131,149	6,220,866	6,311,929	6,404,358	6,498,173	5,901,867	5,906,965	5,912,140	5,971,513	6,031,505	6,092,124
Net Cash Flow	373,191	469,226	(300,615)	(237,800)	(171,810)	246,422	259,119	272,005	285,086	298,362	311,837	325,515	339,398	353,488	367,791	(59,221)	(136,039)	(214,009)	(239,029)	(264,695)	(291,019)
Cumulative Net Cash Flow	373,191	842,417	541,802	304,002	132,192	378,615	637,733	909,739	1,194,824	1,493,186	1,805,024	2,130,538	2,469,936	2,823,424	3,191,215	3,131,994	2,995,954	2,781,945	2,542,916	2,278,220	1,987,201
Cash Balance	615,779	1,085,005	784,390	546,590	374,780	621,202	880,321	1,152,326	1,437,412	1,735,774	2,047,611	2,373,126	2,712,523	3,066,012	3,433,803	3,374,581	3,238,542	3,024,533	2,785,503	2,520,808	2,229,789
Recommended Cash Balance	1,513,167	2,279,483	2,290,932	2,302,046	2,138,327	2,152,402	2,166,688	2,181,188	2,195,906	2,210,844	2,226,007	2,241,397	2,257,018	2,272,873	2,038,966	2,055,301	2,071,880	2,088,709	2,105,789	2,123,126	2,140,723

Alter, One Retail (DW) Water Rates / kgal																					
Residential Tier 1 - < 9,000 gals	\$4.19	\$4.61	\$4.86	\$4.98	\$5.11	\$5.24	\$5.31	\$5.39	\$5.48	\$5.56	\$5.64	\$5.73	\$5.81	\$5.90	\$5.99	\$5.39	\$5.39	\$5.39	\$5.44	\$5.50	\$5.55
Residential Tier 2 - 9 to 15,000 gals	\$4.45	\$4.90	\$5.16	\$5.29	\$5.43	\$5.56	\$5.64	\$5.73	\$5.82	\$5.90	\$5.99	\$6.08	\$6.17	\$6.26	\$6.36	\$5.72	\$5.72	\$5.72	\$5.78	\$5.84	\$5.90
Residential Tier 3 - > 15,000 gals	\$5.32	\$5.85	\$6.17	\$6.33	\$6.49	\$6.65	\$6.75	\$6.85	\$6.95	\$7.06	\$7.16	\$7.27	\$7.38	\$7.49	\$7.60	\$6.84	\$6.84	\$6.84	\$6.91	\$6.98	\$7.05

Multi-Family Tier 1 - < 9,000 gals	\$4.19	\$4.61	\$4.86	\$4.98	\$5.11	\$5.24	\$5.31	\$5.39	\$5.48	\$5.56	\$5.64	\$5.73	\$5.81	\$5.90	\$5.99	\$5.39	\$5.39	\$5.39	\$5.44	\$5.50	\$5.55
Multi-Family Tier 2 - 9 to 15,000 gals	\$4.40	\$4.84	\$5.11	\$5.23	\$5.36	\$5.50	\$5.58	\$5.67	\$5.75	\$5.84	\$5.92	\$6.01	\$6.10	\$6.19	\$6.29	\$5.66	\$5.66	\$5.66	\$5.72	\$5.77	\$5.83
Multi-Family Tier 3 - > 15,000 gals	\$4.50	\$4.95	\$5.22	\$5.35	\$5.49	\$5.62	\$5.71	\$5.79	\$5.88	\$5.97	\$6.06	\$6.15	\$6.24	\$6.34	\$6.43	\$5.79	\$5.79	\$5.79	\$5.85	\$5.90	\$5.96

Commercial All Tiers	\$4.61	\$5.07	\$5.35	\$5.48	\$5.62	\$5.76	\$5.85	\$5.94	\$6.02	\$6.11	\$6.21	\$6.30	\$6.39	\$6.49	\$6.59	\$5.93	\$5.93	\$5.93	\$5.99	\$6.05	\$6.11
----------------------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------

County & Schools All Tiers	\$4.61	\$5.07	\$5.35	\$5.48	\$5.62	\$5.76	\$5.85	\$5.94	\$6.02	\$6.11	\$6.21	\$6.30	\$6.39	\$6.49	\$6.59	\$5.93	\$5.93	\$5.93	\$5.99	\$6.05	\$6.11
----------------------------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------	--------

Customer Charge per Meter Size																					
or < 1.25"	\$7.93	\$8.72	\$9.20	\$9.43	\$9.67	\$9.91	\$10.06	\$10.21	\$10.36	\$10.52	\$10.68	\$10.84	\$11.00	\$11.16	\$11.33	\$10.20	\$10.20	\$10.20	\$10.30	\$10.40	\$10.51
1.5"	\$25.12	\$27.63	\$29.15	\$29.88	\$30.63	\$31.39	\$31.86	\$32.34	\$32.83	\$33.32	\$33.82	\$34.33	\$34.84	\$35.36	\$35.89	\$32.31	\$32.31	\$32.31	\$32.63	\$32.95	\$33.28
2"	\$37.50	\$41.25	\$43.52	\$44.61	\$45.72	\$46.86	\$47.57	\$48.28	\$49.01	\$49.74	\$50.49	\$51.24	\$52.01	\$52.79	\$53.58	\$48.23	\$48.23	\$48.23	\$48.71	\$49.20	\$49.69
2.5" to 3"	\$74.00	\$81.40	\$85.88	\$88.02	\$90.22	\$92.48	\$93.87	\$95.28	\$96.70	\$98.16	\$99.63	\$101.12	\$102.64	\$104.18	\$105.74	\$95.17	\$95.17	\$95.17	\$96.12	\$97.08	\$98.05
4"	\$126.00	\$138.60	\$146.22	\$149.88	\$153.63	\$157.47	\$159.83	\$162.23	\$164.66	\$167.13	\$169.64	\$172.18	\$174.76	\$177.38	\$180.05	\$162.04	\$162.04	\$162.04	\$163.66	\$165.30	\$166.95
6"	\$266.00	\$292.60	\$308.69	\$316.41	\$324.32	\$332.43	\$337.42	\$342.48	\$347.61	\$352.83	\$358.12	\$363.49	\$368.94	\$374.48	\$380.10	\$342.09	\$342.09	\$342.09	\$345.51	\$348.96	\$352.45
8"	\$439.50	\$483.45	\$510.04	\$522.79	\$535.86	\$549.26	\$557.50	\$565.86	\$574.35	\$582.96	\$591.71	\$600.58	\$609.59	\$618.73	\$628.01	\$565.21	\$565.21	\$565.21	\$570.87	\$576.57	\$582.34

FIG 19 - Alt Three – Water Production

Expense Forecast			ACTUAL	BUDGET	BUDGET	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST
			2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036
			1.50%																				
Supervision and Operations			957,506	975,822	990,459	1,005,316	1,020,396	1,035,702	1,051,237	1,067,006	1,083,011	1,099,256	1,115,745	1,132,481	1,149,468	1,166,711	1,184,211	1,201,974	1,220,004	1,238,304	1,256,879	1,275,732	1,294,868
Pumping Power			522,501	800,000	812,000	824,180	836,543	849,091	861,827	874,755	887,876	901,194	914,712	928,433	942,359	956,495	970,842	985,405	1,000,186	1,015,188	1,030,416	1,045,873	1,061,561
Wells			83,059	137,508	139,571	141,664	143,789	145,946	148,135	150,357	152,613	154,902	157,225	159,584	161,977	164,407	166,873	169,376	171,917	174,496	177,113	179,770	182,466
Booster Pump Stations			121,154	125,236	127,115	129,021	130,957	132,921	134,915	136,938	138,993	141,077	143,194	145,341	147,522	149,734	151,980	154,260	156,574	158,923	161,307	163,726	166,182
Treatment			42,144	105,199	106,777	108,379	110,004	111,654	113,329	115,029	116,755	118,506	120,283	122,088	123,919	125,778	127,665	129,579	131,523	133,496	135,498	137,531	139,594
Storage Tanks			20,317	19,600	19,894	20,192	20,495	20,803	21,115	21,431	21,753	22,079	22,410	22,747	23,088	23,434	23,786	24,142	24,505	24,872	25,245	25,624	26,008
Transmission Lines			54,999	65,509	66,492	67,489	68,501	69,529	70,572	71,630	72,705	73,795	74,902	76,026	77,166	78,324	79,499	80,691	81,901	83,130	84,377	85,643	86,927
Non Potable System			175,711	642,187	372,422	300,000	300,000	315,000	315,000	319,725	324,521	329,389	334,330	339,344	344,435	349,601	354,845	360,168	365,570	371,054	376,620	382,269	388,003
Interdepartmental Charges			227,774	263,893	267,851	271,869	275,947	280,086	284,288	288,552	292,880	297,274	301,733	306,259	310,852	315,515	320,248	325,052	329,927	334,876	339,900	344,998	350,173
Administrative Division Allocation			521,533	505,254	512,833	520,525	528,333	536,258	544,302	552,467	560,754	569,165	577,702	586,368	595,163	604,091	613,152	622,350	631,685	641,160	650,777	660,539	670,447
State Water Tax			34,855	45,000	45,675	46,360	47,056	47,761	48,478	49,205	49,943	50,692	51,453	52,224	53,008	53,803	54,610	55,429	56,260	57,104	57,961	58,830	59,713
Debt Service			222,382	254,182	309,021	339,924	373,916	411,308	452,438	497,682	547,450	602,195	662,415	672,351	682,436	692,673	703,063	713,609	724,313	735,178	746,205	757,399	768,760
Capital Annuity - NP R&R				127,000	129,000	160,000	165,000	187,000	187,000	195,000	201,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000	210,000
Capital Annuity - WP CIP & R&R				-	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000	1,615,000
Capital - WP CIP			1,937,194	3,000,000					3,000,000				3,000,000				3,000,000						3,000,000
Capital Paid with Debt/Grants			550,000	483,300	712,500	618,750	825,000	975,000	562,500	487,500	693,750	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000
Capital Paid with Reserves																							
Total Operation Expenses			2,984,935	3,939,390	3,770,110	3,774,920	3,855,937	3,956,059	4,045,636	4,144,778	4,249,253	4,359,525	4,476,104	4,543,246	4,611,394	4,680,565	4,750,774	4,822,035	4,894,366	4,967,781	5,042,298	5,117,933	5,194,702
Total Capital Expenditures			1,937,194	3,000,000	1,615,000	1,615,000	1,615,000	1,615,000	3,750,000	1,615,000	1,615,000	1,615,000	3,750,000	1,615,000	1,615,000	1,615,000	3,750,000	1,615,000	1,615,000	1,615,000	750,000	750,000	3,750,000
Total Cash Outflow			4,922,129	6,939,390	5,385,110	5,389,920	5,470,937	5,571,059	7,795,636	5,759,778	5,864,253	5,974,525	8,226,104	6,158,246	6,226,394	6,295,565	8,500,774	6,437,035	6,509,366	6,582,781	5,792,298	5,867,933	8,944,702
Revenue Forecast																							
Production in thousand gallons (NP)			84,500	86,400	86,400	90,400	90,400	94,500	94,500	108,600	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500	136,500
Revenue per thousand gallons (NP)			\$ 1.15	\$ 1.15	\$ 2.50	\$ 2.58	\$ 2.66	\$ 2.74	\$ 2.83	\$ 2.92	\$ 3.01	\$ 3.11	\$ 3.20	\$ 3.30	\$ 3.41	\$ 3.52	\$ 3.63	\$ 3.74	\$ 3.86	\$ 3.98	\$ 4.11	\$ 4.24	\$ 4.37
Rate Increase Percentage					117.00%	3.15%	3.15%	3.15%	3.15%	3.15%	3.15%	3.15%	3.15%	3.15%	3.15%	3.15%	3.15%	3.15%	3.15%	3.15%	3.15%	3.15%	3.15%
Total Sales Revenue (NP)			\$ 97,175	\$ 99,360	\$ 216,000	\$ 233,119	\$ 240,462	\$ 259,286	\$ 267,454	\$ 317,041	\$ 411,044	\$ 423,992	\$ 437,347	\$ 451,124	\$ 465,334	\$ 479,992	\$ 495,112	\$ 510,708	\$ 526,795	\$ 543,389	\$ 560,506	\$ 578,162	\$ 596,374
Production in thousand gallons			1,250,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000	1,150,000
Revenue per thousand gallons			\$ 2.88	\$ 3.16	\$ 3.48	\$ 3.53	\$ 3.58	\$ 3.64	\$ 3.71	\$ 3.78	\$ 3.86	\$ 3.96	\$ 4.06	\$ 4.16	\$ 4.30	\$ 4.45	\$ 4.61	\$ 4.72	\$ 4.84	\$ 4.60	\$ 4.67	\$ 4.74	\$ 4.81
Rate Increase Percentage				10.00%	10.00%	1.50%	1.50%	1.50%	2.00%	2.00%	2.00%	2.50%	2.50%	2.50%	3.50%	3.50%	3.50%	2.50%	2.50%	-5.00%	1.50%	1.50%	1.50%
Total Sales Revenue			3,606,504	3,636,875	4,000,563	4,060,571	4,121,480	4,183,302	4,266,968	4,352,307	4,439,353	4,550,337	4,664,095	4,780,698	4,948,022	5,121,203	5,300,445	5,432,956	5,568,780	5,290,341	5,369,696	5,450,242	5,531,995
Interest on Inter-Utility Loans			182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106	182,106
Interest on Utility Reserves			200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000	200,000
Other Revenue			90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000
Bond Federal Subsidy			27,576	27,576	27,576	27,576	27,576	27,576	27,576	27,576	21,338	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940	14,940
Federal or State Grant/Loan			550,000	483,300	712,500	618,750	825,000	975,000	562,500	487,500	693,750	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000	375,000
Inter-Utility Loan																							
Total Cash Inflow			4,753,361	4,719,217	5,428,745	5,412,122	5,686,624	5,917,270	5,596,604	5,656,530	6,037,591	5,836,374	5,963,488	6,093,867	6,275,402	6,463,241	6,657,603	6,805,710	6,957,621	6,695,776	6,792,248	6,890,449	6,990,415
Net Cash Flow			(168,768)	(2,220,173)	43,635	22,202	215,687	346,211	(2,199,033)	(103,247)	173,338	(138,150)	(2,262,616)	(64,378)	49,008	167,676	(1,843,171)	368,675	448,255	112,995	999,950	1,022,517	(1,954,286)
Cumulative Net Cash Flow			(168,768)	(2,388,941)	(2,345,306)	(2,323,104)	(2,107,418)	(1,761,207)	(3,960,239)	(4,063,487)	(3,890,148)	(4,028,299)	(6,290,915)	(6,355,293)	(6,306,285)	(6,138,610)	(7,981,781)	(7,613,106)	(7,164,851)	(7,051,856)	(6,051,906)	(5,029,389)	(6,983,675)
Cash Balance			10,362,736	8,142,563	8,186,198	8,208,400	8,424,086	8,770,297	6,571,265	6,468,017	6,641,356	6,503,205	4,240,589	4,176,211	4,225,219	4,392,894	2,549,723	2,918,398	3,366,653	3,479,648	4,479,598	5,502,115	3,547,829
Recommended Cash Balance			5,419,604	3,924,544	3,942,498	3,971,011	4,024,376	6,183,599	4,083,548	4,116,901	4,153,665	6,316,845	4,210,447	4,239,479	4,268,946	6,433,855	4,329,213	4,360,026	4,391,302	3,558,046	3,590,267	6,622,971	3,656,166
Alter. One Wholesale (WP) Water Rates / kgal			\$2.89	\$3.16	\$3.48	\$3.53	\$3.58	\$3.64	\$3.71	\$3.78	\$3.86	\$3.96	\$4.06	\$4.16	\$4.30	\$4.45	\$4.61	\$4.72	\$4.84	\$4.60	\$4.67	\$4.74	\$4.81
Alter. One Non-Potable (NP) Water Rates / kgal			\$1.15	\$1.15	\$2.50	\$2.58	\$2.66	\$2.74	\$2.83	\$2.92	\$3.01	\$3.11	\$3.20	\$3.30	\$3.41	\$3.52	\$3.63	\$3.74	\$3.86	\$3.98	\$4.11	\$4.24	\$4.37

Cash Balance Summaries for Combined DW & WP

- Compares Calculated Cash Balances to “Recommended Cash Balances” for both DW & WP for Each Alternative Model
 - Blue Highlighted Years are When Major WP CIP Well Projects are Planned
 - Clear (non-highlighted) Cash Balances are Calculated Model Values
 - “Recommended Cash Balance” are Highlighted in Mustard Color
 - Bottom Value in Each Scenario is the Difference Between Calculated and Recommended Cash Balances for the Combined DW + WP Systems
 - Presentation Fig 13 Differs from Report Fig 13 with the Addition of the Report’s Recommended Combined Scenario (Alt Two for DW / Alt Three for WP / Alt Two for NP)
- Alternative One – “Baseline” Scenario
 - Maximum Cash Balance Swings of -\$2,967,658 Under & \$3,275,111 Over
- Alternative Two – “Accelerated DW CIP & Conservative WP CIP” Scenario
 - Maximum Cash Balance Swings of -\$1,445,318 Under & \$2,693,167 Over
- Alternative Three – “Mellower DW Rate & Adjusted WP CIP” Scenario
 - Maximum Cash Balance Swings of -\$1,247,822 Under & \$1,569,045 Over
- Alternative Final – “Report Recommendation” Scenario
 - This Alt Final (at bottom) has 7 Middle Years Where the Calculated Combined Cash Balance is Significantly and Possibly Unacceptably Different than the “Recommended Cash Balance”
 - Maximum Cash Balance Swings of -\$2,480,203 Under & \$1,726,218 Over

FIG – 13 - DW + WP Summary of Cash Balances

		ACTUAL 2016	BUDGET 2017	BUDGET 2018	FORECAST 2019	FORECAST 2020	FORECAST 2021	FORECAST 2022	FORECAST 2023	FORECAST 2024	FORECAST 2025	FORECAST 2026	FORECAST 2027	FORECAST 2028	FORECAST 2029	FORECAST 2030	FORECAST 2031	FORECAST 2032	FORECAST 2033	FORECAST 2034	FORECAST 2035	FORECAST 2036
Air One	WP	10,362,736	8,155,213	8,327,763	8,475,360	8,812,750	9,276,267	6,304,380	6,263,999	6,464,681	3,301,384	3,094,021	2,893,116	2,698,767	2,511,071	(669,870)	(93,956)	488,916	1,078,851	1,675,953	2,280,332	(107,904)
Air One	WP	5,673,786	4,118,566	4,167,422	4,229,927	4,320,683	7,386,037	4,466,230	4,549,351	7,640,860	4,729,259	4,767,798	4,806,915	4,846,619	7,886,918	4,177,822	4,219,339	4,261,480	4,304,252	4,347,666	7,993,731	4,436,456
Air One	DW	615,779	839,058	1,496,752	1,421,548	1,364,716	1,676,531	2,002,024	2,341,399	2,694,865	3,062,633	3,444,917	3,841,935	4,253,909	4,681,062	5,123,623	5,831,822	6,555,894	7,296,077	8,052,613	8,825,747	9,615,728
Air One	DW	1,513,167	1,529,483	2,290,932	2,302,046	2,138,327	2,152,402	2,166,688	2,181,188	2,195,906	2,210,844	2,226,007	2,241,397	2,257,018	2,272,873	2,038,966	2,055,301	2,071,880	2,088,709	2,105,789	2,123,126	2,140,723
Air One	WP-DW	10,978,515	8,994,271	9,824,515	9,896,908	10,177,466	10,952,798	8,306,404	8,605,398	9,159,546	6,364,017	6,538,937	6,735,051	6,952,675	7,192,134	4,453,753	5,737,866	7,044,810	8,374,928	9,728,566	11,106,079	9,507,823
Air One	WP-DW	7,186,953	5,648,049	6,458,354	6,531,973	6,459,010	9,538,439	6,632,918	6,730,539	9,836,706	6,940,104	6,993,805	7,048,312	7,103,637	10,150,792	6,216,789	6,274,640	6,333,360	6,392,860	6,453,455	9,514,857	6,577,180
		3,791,562	3,346,223	3,366,161	3,364,935	3,718,436	1,414,360	1,671,487	1,874,859	(677,219)	(576,087)	(454,868)	(313,362)	(150,962)	(2,967,658)	(1,761,036)	(336,774)	711,450	1,981,967	3,275,111	1,591,222	2,910,644
Air Two	WP	10,362,736	8,155,213	8,327,763	8,515,504	8,934,790	9,523,608	6,722,133	6,901,914	7,375,945	7,540,457	4,717,440	4,959,557	5,269,309	5,648,462	3,100,054	3,805,081	4,519,003	5,216,745	5,923,272	6,612,875	4,311,341
Air Two	WP	5,673,786	4,118,566	4,167,422	4,229,927	4,320,681	7,386,037	4,466,230	4,549,351	7,640,860	4,729,259	4,767,798	4,806,915	4,846,619	7,886,918	4,177,822	4,219,339	4,261,480	4,304,252	4,347,666	7,993,731	4,436,456
Air Two	DW	615,779	1,085,005	784,390	546,590	374,780	621,202	880,321	1,152,326	1,437,412	1,735,774	2,047,611	2,373,126	2,712,523	3,066,012	3,433,803	3,374,581	3,319,721	3,269,289	3,223,350	3,181,971	3,116,502
Air Two	DW	1,513,167	2,279,483	2,290,932	2,302,046	2,138,327	2,152,402	2,166,688	2,181,188	2,195,906	2,210,844	2,226,007	2,241,397	2,257,018	2,272,873	2,038,966	2,055,301	2,071,880	2,088,709	2,105,789	2,123,126	2,140,723
Air Two	WP-DW	10,978,515	9,240,218	9,112,153	9,062,094	9,309,570	10,144,810	7,602,454	8,054,241	8,813,357	9,276,231	6,765,051	7,332,683	7,981,632	8,714,474	6,533,856	7,179,662	7,838,724	8,486,034	9,146,622	9,794,846	7,427,643
Air Two	WP-DW	7,186,953	6,398,049	6,458,354	6,531,973	6,459,010	9,538,439	6,632,918	6,730,539	9,836,706	6,940,104	6,993,805	7,048,312	7,103,637	10,150,792	6,216,789	6,274,640	6,333,360	6,392,860	6,453,455	9,514,857	6,577,180
		3,791,562	2,842,169	2,653,799	2,530,121	2,850,560	606,372	969,536	1,323,701	(1,023,409)	2,336,127	(228,754)	284,371	877,995	(1,445,318)	317,068	905,022	1,505,364	2,093,073	2,693,167	279,990	850,464
Air Three	WP	10,362,736	8,142,563	8,186,598	8,208,400	8,424,086	8,770,297	6,571,265	6,468,017	6,641,356	6,503,205	4,240,589	4,176,211	4,225,219	4,392,894	2,549,723	2,918,398	3,366,653	3,479,648	4,479,598	5,502,115	3,547,829
Air Three	WP	5,419,604	3,924,544	3,942,498	3,971,011	4,024,376	6,183,599	4,083,548	4,116,901	4,153,665	6,316,845	4,210,447	4,239,479	4,268,946	6,433,855	4,329,213	4,360,026	4,391,302	3,558,046	3,590,267	6,622,971	3,656,166
Air Three	DW	615,779	1,085,005	784,390	546,590	374,780	621,202	880,321	1,152,326	1,437,412	1,735,774	2,047,611	2,373,126	2,712,523	3,066,012	3,433,803	3,374,581	3,318,542	3,024,533	2,785,503	2,520,808	2,229,789
Air Three	DW	1,513,167	2,279,483	2,290,932	2,302,046	2,138,327	2,152,402	2,166,688	2,181,188	2,195,906	2,210,844	2,226,007	2,241,397	2,257,018	2,272,873	2,038,966	2,055,301	2,071,880	2,088,709	2,105,789	2,123,126	2,140,723
Air Three	WP-DW	10,978,515	9,227,568	8,970,588	8,754,989	8,798,866	9,393,500	7,451,586	7,620,344	8,078,768	8,238,979	6,288,201	6,549,337	6,937,742	7,458,906	5,983,526	6,292,979	6,605,195	6,504,181	7,265,201	8,022,923	5,777,617
Air Three	WP-DW	5,932,771	6,204,027	6,233,430	6,273,057	6,162,702	8,336,001	6,250,236	6,298,089	6,349,570	8,527,689	6,436,454	6,480,876	6,525,964	8,706,729	6,368,180	6,415,327	6,463,182	5,646,755	5,696,056	8,746,097	3,798,689
		4,045,744	3,023,540	2,737,157	2,481,933	2,636,164	1,050,499	1,201,350	1,322,255	1,729,197	(288,710)	(148,254)	68,461	411,778	(1,247,822)	(384,653)	(122,348)	142,013	857,426	1,569,045	(723,174)	(19,271)
Air Final	WP	10,362,736	8,155,213	8,327,763	8,477,620	8,819,821	9,290,511	6,349,642	6,366,669	6,655,150	6,629,475	3,611,515	3,653,815	3,806,528	4,074,774	1,463,871	2,671,562	3,950,207	4,880,756	5,823,583	6,776,449	4,741,926
Air Final	WP	5,673,786	4,118,566	4,167,422	4,229,927	4,320,683	7,386,037	4,466,230	4,549,351	7,640,860	4,729,259	4,767,798	4,806,915	4,846,619	7,886,918	4,177,822	4,219,339	4,261,480	4,304,252	4,347,666	7,993,731	4,436,456
Air Final	DW	615,779	1,085,005	742,698	595,714	469,774	715,196	977,049	1,255,579	1,551,038	1,863,678	2,193,758	1,948,152	2,130,169	2,238,724	2,272,715	2,285,318	2,303,360	2,326,923	2,356,089	2,390,943	2,431,569
Air Final	DW	1,513,167	1,529,483	2,540,932	2,552,046	2,189,327	2,403,402	2,416,688	2,431,188	2,445,906	2,460,844	2,476,007	1,991,397	2,007,018	2,022,873	2,038,966	2,055,301	2,071,880	2,088,709	2,105,789	2,123,126	2,140,723
Air Final	WP-DW	10,978,515	9,240,218	9,070,461	9,073,333	9,289,395	10,005,707	7,326,691	7,622,249	8,206,188	8,493,153	5,805,273	5,601,967	5,936,697	6,313,498	3,736,586	4,956,880	6,253,567	7,207,679	8,179,673	9,167,392	7,173,496
Air Final	WP-DW	7,186,953	6,648,049	6,708,354	6,781,973	6,709,010	9,788,439	6,882,918	6,980,539	10,086,706	7,140,104	7,243,805	6,798,312	6,853,637	9,909,792	6,236,789	6,274,640	6,333,360	6,392,860	6,453,455	9,514,857	6,577,180
		3,791,562	2,592,169	2,362,107	2,291,361	2,580,385	217,268	443,773	641,709	(1,880,577)	1,303,049	(1,438,532)	(1,196,345)	(916,940)	(3,596,294)	(2,480,203)	(1,317,760)	(79,793)	814,719	1,726,218	(347,460)	596,316

Next Steps?

- Refine the Model Based on BPU and Staff Review
- Develop a Scenario that Meets DPU Goals
- Develop a Rate Structure per the Revised Model Outcome Using Final Recommendations for O&M and CIP Program Expenditures
- Annually Refine the Model Data Sets and Assumptions Based on New Data Inputs

Questions?

Deputy Utilities Manager – Gas, Water, Sewer

Department of Public Utilities

662-8215

jack.richardson@lacnm.us