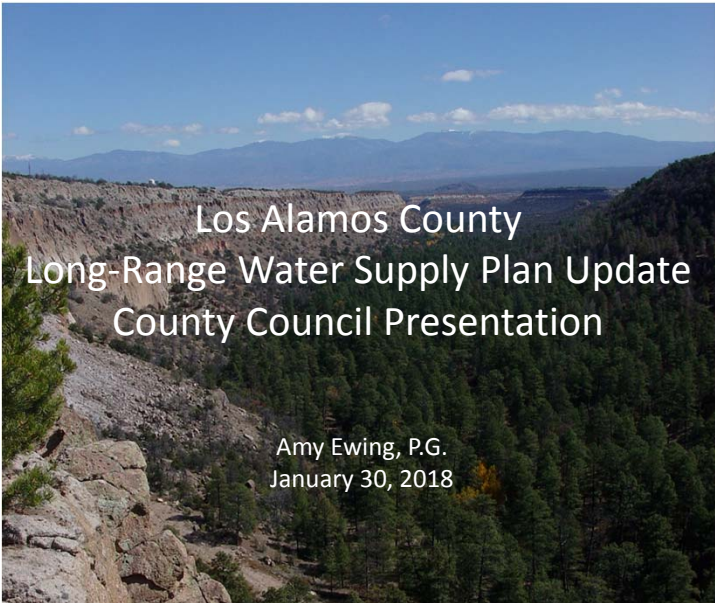




Los Alamos County
Long-Range Water Supply Plan Update
County Council Presentation

Amy Ewing, P.G.
January 30, 2018



Daniel B. Stephens & Associates, Inc.



Topics

1. Introduction
2. Overview of plan updates
3. Water demand projections
4. Questions



Daniel B. Stephens & Associates, Inc.



Introduction

- The Department of Public Utilities (DPU) supplies water for Los Alamos, White Rock, Los Alamos National Laboratory, and Bandelier National Monument.
- To prepare for the future water supply needs of these communities, a long-range water supply plan was published in 2006 and an update has been prepared (2017).



Daniel B. Stephens & Associates, Inc.



Introduction

- The objective of the plan is to
 - evaluate projected demands in relation to available supply,
 - consider water quality and water rights risks to the supply, and
 - ensure that both a viable physical supply and associated water rights are in place as needed to meet future demands.



Daniel B. Stephens & Associates, Inc.



Introduction

- The update roughly follows the organization of the 2006 plan.
- Information from the 2006 plan was used as a starting point and information was updated to reflect the changes that have occurred since the 2006 plan was finalized.



Daniel B. Stephens & Associates, Inc.



LRWS Plan Outline

- Section 1, Introduction
- Section 2, Overview of Los Alamos County Water System
- Section 3, Hydrogeologic Overview and Risks to Water Supply
- Section 4, Water Rights



Daniel B. Stephens & Associates, Inc.



LRWS Plan Outline (continued)

- Section 5, Water Demand
- Section 6, Reconciliation of Supply with Demand
- Section 7, Potential Impacts of Climate Change
- Section 8, Water Conservation
- Section 9, Recommendations



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 2, Water System Overview
 - The water system is supplied by 12 wells that draw on the regional aquifer beneath the Pajarito Plateau.
 - Well depths are up to 3,000 feet below ground surface (ft bgs), and water levels range from approximately 250 to 1,200 ft bgs.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 2, Water System Overview (cont.)
 - Two new applications have been filed recently:
 - An application for an additional point of diversion for a new well that will be called Otowi Well 2 was filed in April 2016 and this well is being drilled under an exploratory permit.
 - An application for permit to change an existing water right was filed jointly by DOE and the County in support of the chromium plume control interim measure and chromium plume center characterization project (May 2016), and emergency authorization was received on September 10, 2016.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 3, Risks to Water Supply
 - Demonstrated saturated thickness is at least 1,900 feet (supply well PM-5).
 - Average water level declines:
 - Pajarito Well Field average (1965-2016): –1.08 ft/yr
 - Otowi Well Field average (1990-2016): –0.81 ft/yr
 - Guaje Well Field average (1954-2016): –3.45 ft/yr
 - Even if net recharge is negligible, continuation of the observed rates of decline does not represent a substantial risk to the water supply.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 3, Risks to Water Supply
 - Monitoring of production wells is conducted by the DPU as part of routine monitoring and compliance with the U.S. Safe Drinking Water Act, and monitoring is also conducted by LANL.
 - Recent monitoring and reporting indicates that all drinking water produced by the DPU water system meets federal and state drinking water standards.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 3, Risks to Water Supply
 - The water plan discusses the known contamination and water quality standard exceedances, highlighting issues in the regional aquifer.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 3, Risks to Water Supply
 - Perchlorate
 - Perchlorate contamination is present in groundwater beneath Mortandad Canyon.
 - In 2015, perchlorate concentrations exceeded the 2012 LANL Compliance Order on Consent screening level of 4 µg/L in one monitoring well completed in the regional aquifer (R-15, detections ranged from 7.22 to 9.05 µg/L).



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 3, Risks to Water Supply
 - Perchlorate (continued)
 - The 2016 LANL Compliance Order on Consent does not include a screening level for perchlorate, and the perchlorate standard that will apply going forward is an NMED tap water screening level of 13.8 µg/L.
 - If future detected concentrations are similar, this screening level will not be exceeded in the regional aquifer.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 3, Risks to Water Supply
 - Hexavalent chromium
 - A hexavalent chromium plume is present in the regional aquifer, and the primary source is blowdown of potassium dichromate from the TA-03 power plant cooling tower that occurred from 1956 to 1972.
 - Since the 2006 water plan was completed, the areal extent and concentrations within the plume have been better defined.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 3, Risks to Water Supply
 - Hexavalent chromium (continued)
 - The New Mexico Water Quality Control Commission groundwater standard for human health is 50 µg/L for chromium.
 - In 2015, chromium concentrations exceeded this standard in five regional aquifer monitoring wells—R-28, R-42, R-62, R-50 Screen 1, and R-43 Screen 1—with exceedances ranging from 117 to 915 µg/L.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 3, Risks to Water Supply
 - Hexavalent chromium (continued)
 - The May 2015 *Interim Measures Work Plan* presents LANL's approach for controlling movement of chromium-contaminated groundwater along the downgradient portions of the plume.
 - LANL plans to extract contaminated groundwater, treat it at the surface using ion exchange, and reinject it into the aquifer, with project implementation beginning in 2016.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 3, Risks to Water Supply
 - Hexavalent chromium (continued)
 - The July 2015 *Work Plan for Chromium Plume Center Characterization* outlines actions that will be implemented to further investigate the aquifer in the center of the chromium plume and further characterize the nature and extent of the contamination in order to identify remedial alternatives for the chromium plume.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 4, Water Rights
 - The County's water rights were originally owned by the U.S. DOE.
 - In 2001, 70 percent ownership was transferred to the County, and U.S. DOE retained 30 percent ownership.
 - The U.S. DOE water rights were leased until 2011, when the lease expired.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 4, Water Rights (continued)
 - The joint application for permit to change an existing water right in support of the chromium plume control interim measure and chromium plume center characterization project is for 679 ac-ft/yr.
 - The County plans to enter into a new lease with the U.S. DOE for their water rights (1,662.39 ac-ft/yr), for use by all customers, including LANL.



Daniel B. Stephens & Associates, Inc.

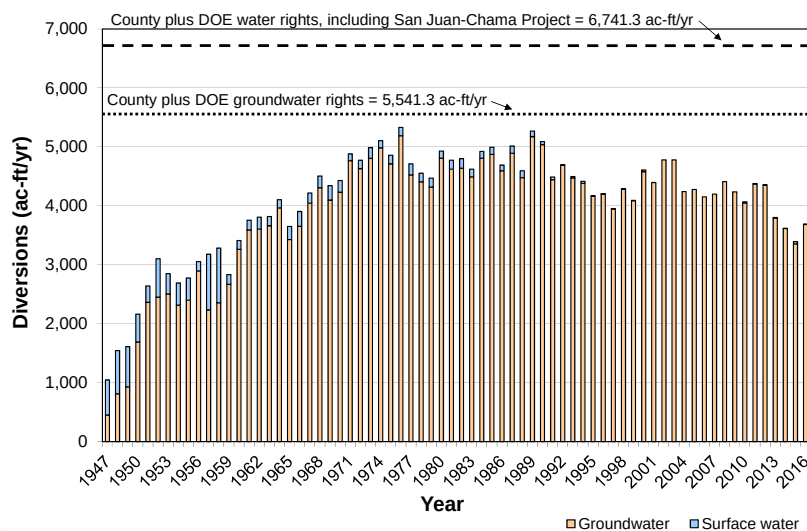
Overview of Plan Updates

- Section 5, Water Demand
 - Between 1950 and 2000, population increased, and since 2000, it has decreased by approximately 2 percent.
 - Diversions increased between 1950 and 1990, due to increased population, and decreased between 1990 and 2010, partially due to water conservation efforts.
 - Demand from the LANL's operations also impacts the magnitude of diversions.

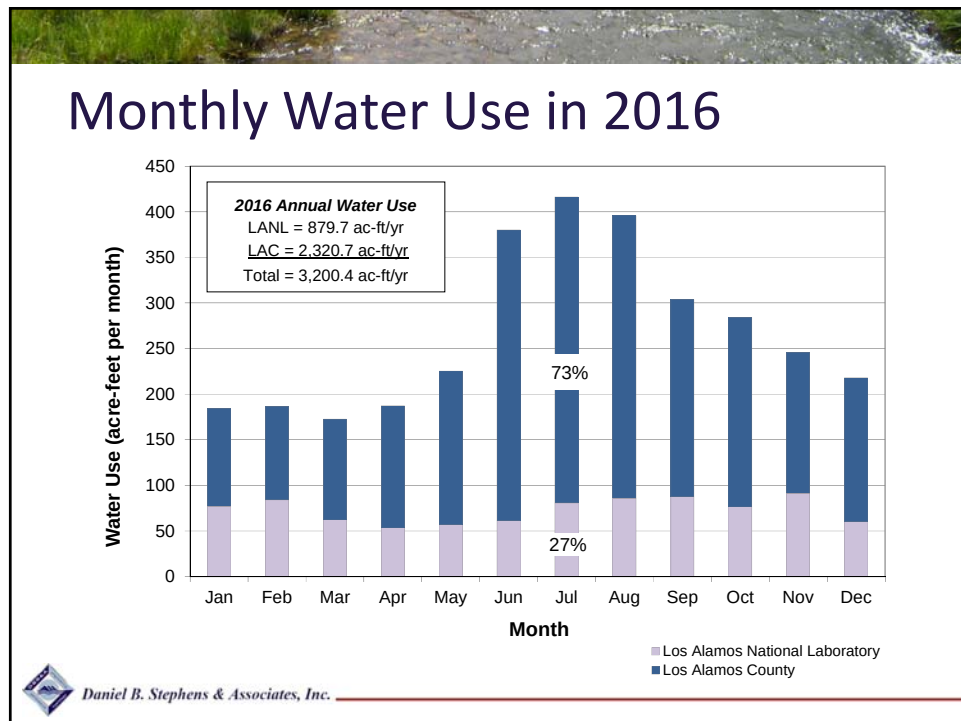
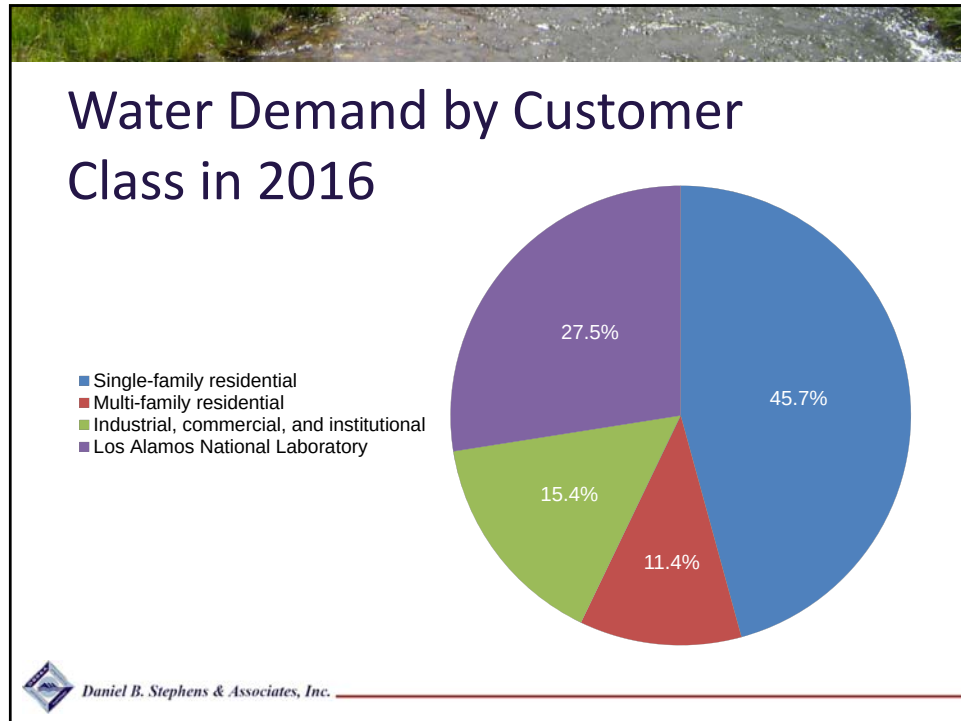


Daniel B. Stephens & Associates, Inc.

Historical Water Diversions



Daniel B. Stephens & Associates, Inc.





Overview of Plan Updates

- Section 5, Water Demand (continued)
 - The 2006 population projections projected rapid growth, totaling 25,000 people in 2020.
 - Contrary to these projections, the population declined between 2000 and 2010, largely due to a reduction in the work force at LANL.
 - Los Alamos County had 17,950 residents in 2010.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 5, Water Demand (continued)
 - Population projections were developed as a part of the 2016 State regional water planning update, and these projections were used for the County water demand projections.
 - Projected County demand is based on population times the 2016 total system water demand (excluding LANL sales) of 144 gallons per day.
 - LANL provided separate water demand projections for FY 2017-2027 (781-1,505 ac-ft/yr).



Daniel B. Stephens & Associates, Inc.

Overview of Plan Updates

- Section 5, Water Demand (continued)
 - Population projections (County):

Year	Low Projection	High Projection
2020	17,988	20,000
2030	17,789	20,812
2040	17,123	21,447
2050	16,480	21,874
2060	15,863	22,092



Daniel B. Stephens & Associates, Inc.

Overview of Plan Updates

- Section 5, Water Demand (continued)
 - Total projected demand (County + LANL):

Year	Low Projection (ac-ft/yr)	High Projection (ac-ft/yr)
2020	3,814	4,138
2030	4,369	4,856
2040	4,262	4,958
2050	4,158	5,027
2060	4,059	5,062



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 6, Water Supply and Demand
 - The County has rights to use 1,200 acre-feet of San Juan-Chama Project water.
 - Bringing it online would diversify the water supply, helping the County to mitigate any future effects due to contamination of existing wells and/or climate change.



Daniel B. Stephens & Associates, Inc.

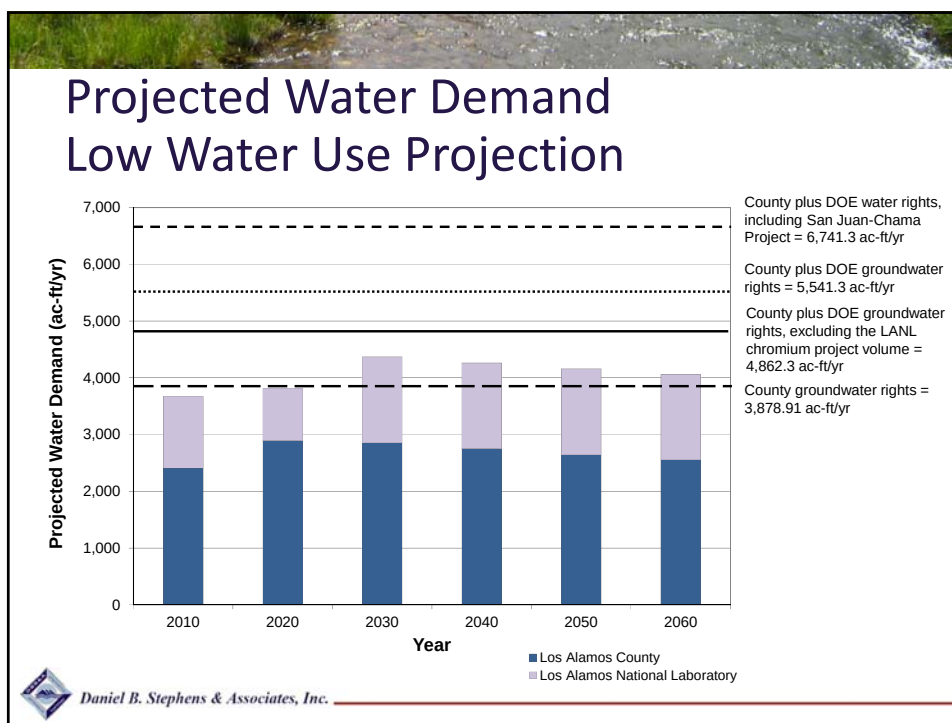


Projected Water Demand

- Section 6, Water Supply and Demand (continued)
 - Demand projections scenarios without additional conservation or U.S. DOE water rights:
 - The County-owned groundwater rights volume (3,878.91 ac-ft/yr) is adequate to meet the DPU only low-water-use projections for all decades, and the DPU-plus-LANL low-water-use projections for 2020.
 - The County-owned groundwater rights volume is not adequate to meet the DPU-plus-LANL low-water-use projections for 2030, 2040, 2050, or 2060.



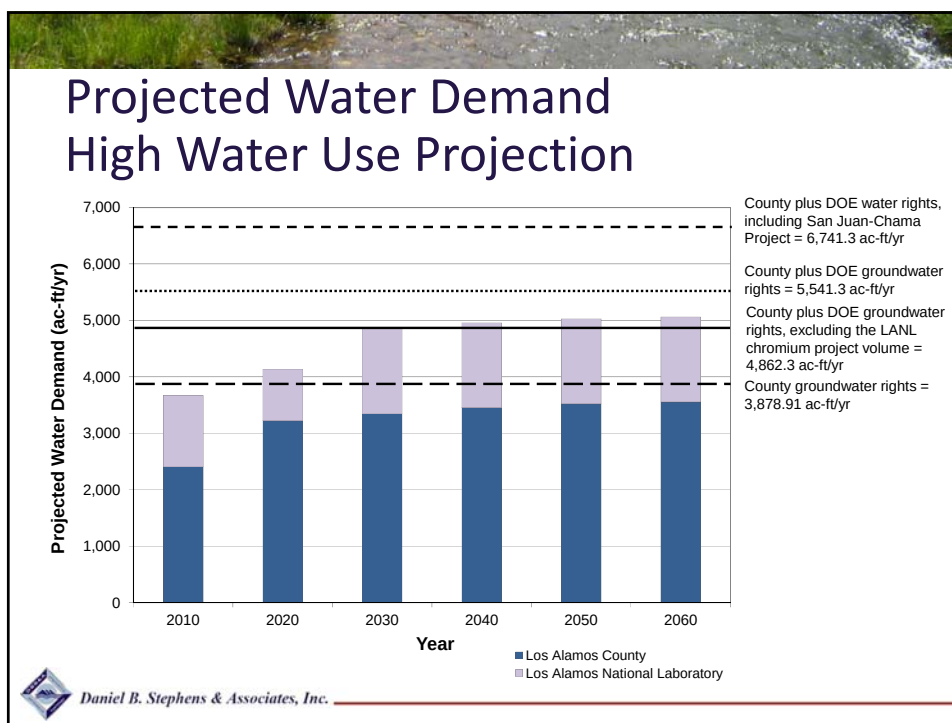
Daniel B. Stephens & Associates, Inc.



Projected Water Demand

- Section 6, Water Supply and Demand (continued)
 - Demand projections scenarios without additional conservation or U.S. DOE water rights (continued):
 - The County-owned groundwater rights volume is adequate to meet the DPU-only high-water use projections for all decades.
 - The County-owned groundwater rights volume is not adequate to meet the DPU-plus-LANL high-water-use projections for any decade.

Daniel B. Stephens & Associates, Inc.

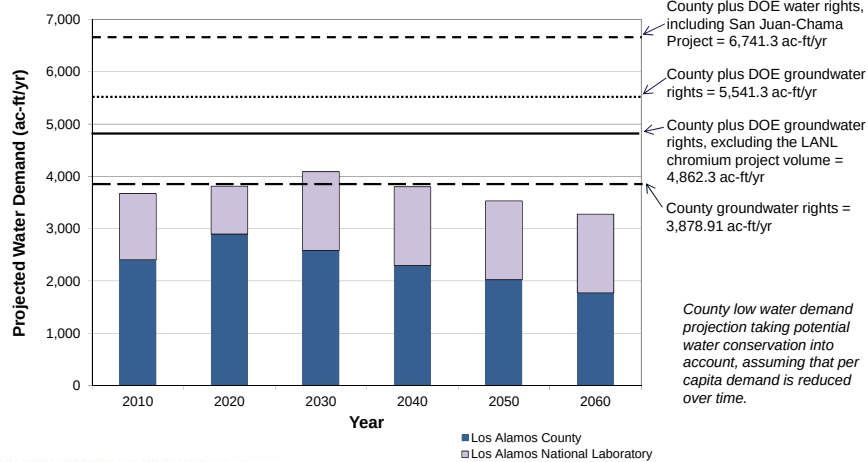


Projected Water Demand

- Section 6, Water Supply and Demand (continued)
 - Demand projections scenarios with additional conservation:
 - With increased conservation, the County-owned groundwater rights volume is not adequate to meet the DPU-plus-LANL low-water-use projections for 2030, but the 2020, 2040, 2050, and 2060 low-water-use projections can be met with this volume.

Daniel B. Stephens & Associates, Inc.

Projected Water Demand Low Water Use Projection With Additional Conservation



Daniel B. Stephens & Associates, Inc.

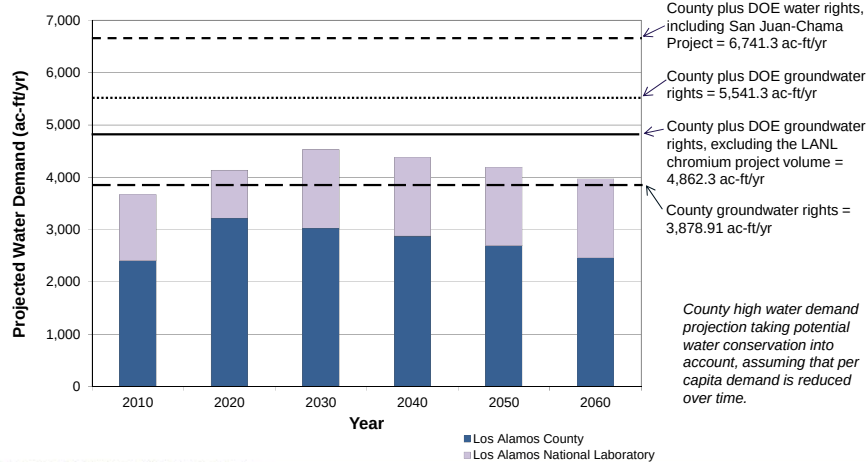
Projected Water Demand

- Section 6, Water Supply and Demand (continued)
 - Demand projections scenarios with additional conservation (continued):
 - Even with increased conservation, the County-owned groundwater rights volume is not adequate to meet any of the DPU-plus-LANL high-water-use projections.



Daniel B. Stephens & Associates, Inc.

Projected Water Demand High Water Use Projection With Additional Conservation



Daniel B. Stephens & Associates, Inc.

Projected Water Demand

- Section 6, Water Supply and Demand (continued)
 - Demand projections scenarios with additional conservation (continued):
 - If the remaining DOE water rights are not leased to the County, the DPU continues to be the sole water provider for LANL, and the high population projections are realized, even with significant additional conservation the County will need to implement a project to bring their San Juan-Chama Project water online.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 7, Impacts of Climate Change
 - Climate change impacts that are anticipated:
 - Increasing temperatures
 - Longer and warmer growing season (resulting in increased outdoor water demand)
 - Increased reservoir evaporation
 - More concentrated and intense precipitation
 - Decreasing streamflow in major rivers across the Southwest
 - Change in the seasonal distribution of streamflow



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 7, Impacts of Climate Change (continued)
 - Recommendations for mitigating the impacts:
 - Implement adaptive management as a part of the long-range water supply plan.
 - Use research and monitoring to fill knowledge gaps and enhance planning capabilities.
 - Continue to implement and update the Los Alamos Energy and Water Conservation Plan.
 - Conjunctively manage surface and groundwater resources.
 - Prepare for the increasing risk of large and severe wildfires.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 8, Water Conservation
 - The updated Energy and Water Conservation Plan focuses on conservation goals for the planning period of 2015 through 2019.
 - A Conservation Advisory Group was formed in 2011 to assist in developing conservation goals.
 - A new long-term water conservation goal of reducing per capita use 9 percent by 2030 (from 144 to 131 gallons per day) was adopted in 2017.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 8, Water Conservation (continued)
 - Specific conservation goals include:
 - Increase water conservation education in the public schools.
 - Increase adult education efforts.
 - Implement residential irrigation water audits.
 - Improve the water waste rule.
 - Implement incentives for outdoor water conservation.
 - Implement the county's non-potable water master plan.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 9, Recommendations
 - Pursue a new lease with the U.S. DOE for the water rights they own.
 - Renegotiate the contract with the U.S. DOE for supplying water to LANL (it expires in 2019).
 - Work closely with LANL and NMED regarding the ongoing monitoring of contaminants.



Daniel B. Stephens & Associates, Inc.



Overview of Plan Updates

- Section 9, Recommendations (continued)
 - Update the water demand analysis in a few years to re-evaluate whether and/or when a San Juan-Chama Project water supply project will be needed.

Unknowns that will better inform the water need projections once defined include

 - (1) execution of a new lease with DOE for the full volume of water rights that they own
 - (2) entering into a new water supply contract between the County and DOE, and
 - (3) definition of the water demands for the chromium remediation project, following completion of the chromium interim measure project.



Daniel B. Stephens & Associates, Inc.



Summary of Requested Changes

- The LACWU acronym was replaced with “County” or “DPU”, as appropriate.
- Water production and water demand data were updated through 2016.
- The recommendation to begin an environmental assessment for a San Juan-Chama Project was removed.



Daniel B. Stephens & Associates, Inc.



Summary of Requested Changes

- Per capita water use analyses were added for 2015 and 2016.
- The water audit analysis was updated using 2016 data.
- A discussion of the finalized County Comprehensive Plan was added.



Daniel B. Stephens & Associates, Inc.



Summary of Requested Changes

- The recommendations were updated to
 - update the water demand analysis in a few years to re-evaluate whether/when a San Juan-Chama Project will be needed, and
 - add a new water supply recommendation addressing water conservation and minimizing water loss.



Daniel B. Stephens & Associates, Inc.

Questions?



Daniel B. Stephens & Associates, Inc.