



# County of Los Alamos

1000 Central Avenue  
Los Alamos, NM 87544

## Agenda - Final Board of Public Utilities

*Jeff Johnson, Chair; Carrie Walker, Vice-chair; Paul  
Frederickson, Stephen McLin and Kathleen Taylor, Members  
Tim Glasco, Ex Officio Member  
Harry Burgess, Ex Officio Member  
Christine Chandler, Council Liaison*

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Wednesday, July 18, 2018

5:30 PM

1000 Central Avenue  
Council Chambers

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### REGULAR SESSION

Complete Board of Public Utilities agenda packets, past agendas, videos, legislation and minutes can be found online at [losalamos.legistar.com](http://losalamos.legistar.com). Learn more about the Board of Public Utilities at [rebrand.ly/LACBPU](http://rebrand.ly/LACBPU).

#### PUBLIC COMMENTS:

Please submit written comments to the Board at [bpu@lacnm.us](mailto:bpu@lacnm.us). Oral public comment is accepted during the two periods identified on the agenda and after initial board discussion on a business item, prior to accepting a main motion on an item. Oral comments should be limited to four minutes per person. Requests to make comments exceeding four minutes should be submitted to the Board in writing prior to the meeting. Individuals representing or making a combined statement for a large group may be allowed additional time at the discretion of the Board. Those making comments are encouraged to submit them in writing either during or after the meeting to be included in the minutes as attachments. Otherwise, oral public comments will be summarized in the minutes to give a brief succinct account of the overall substance of the person's comments.

#### 1. CALL TO ORDER

#### 2. PUBLIC COMMENT

*This section of the agenda is reserved for comments from the public on Consent Agenda items or items that are not otherwise included in this agenda.*

#### 3. APPROVAL OF AGENDA

#### 4. BOARD BUSINESS

##### 4.A. Chair's Report

##### 4.B. Board Member Reports

##### 4.C. Utilities Manager's Report

**4.D. County Manager's Report****4.E. Council Liaison's Report****4.F. Environmental Sustainability Board Liaison's Report****4.G. General Board Business****4.G.1 [10417-18](#) Quarterly Update on Electric Utility Systems & Asset Management**

**Presenters:** Steve Cummins, Deputy Utilities Manager - Power Supply and Rafael De LaTorre, Deputy Utilities Manager - Electric Distribution

*PG. 1-81*

**4.G.2 [10695-18](#) Review of Policy and Procedure Manual to Formally Add Approved Board of Public Utility (PPM)**

**Presenters:** Jeff Johnson, Chair of the Board of Public Utilities

*PG. 82*

**4.G.3 [10697-18](#) Planning for Upcoming Board of Public Utilities Annual Boards & Commissions Presentation to Council on September 25th, 2018**

**Presenters:** Jeff Johnson, Chair of the Board of Public Utilities

*PG. 83-87*

**4.H. Approval of Board Expenses****4.I. Preview of Upcoming Agenda Items****4.I.1 11002-18 Tickler File for the Next 3 Months**

**Presenters:** Board of Public Utilities

*PG. 88-91*

**5. PUBLIC HEARING(S)**

*There are no public hearings scheduled for this meeting.*

**6. CONSENT AGENDA**

*The following items are presented for Board approval under a single motion unless any item is withdrawn by a member for further Board consideration in the "Business" section of the agenda.*

**CONSENT MOTION -**

*I move that the Board of Public Utilities approve the items on the Consent Agenda as presented and that the motions in the staff reports be included in the minutes for the record.*

OR

*I move that the Board of Public Utilities approve the items on the Consent Agenda as amended and that the motions contained in the staff reports, be included in the minutes for the record.*

- 6.A**    [11000-18](#)    Approval of Board of Public Utilities Meeting Minutes

**Presenters:**    Board of Public Utilities

PG. 92-102

**7.        BUSINESS**

- 7.A**    [10954-18](#)    Preliminary Discussion About Sewer Rate Changes

**Presenters:**    Bob Westervelt, Deputy Utilities Manager -  
Finance/Admin

PG. 103-120

- 7.B**    [10951-18](#)    Preliminary Assessment of Electric Vehicle (EV) Charging Stations

**Presenters:**    Steve Cummins, Deputy Utilities Manager - Power  
Supply

PG. 121-168

**8.        STATUS REPORTS**

- 8.A**    [11001-18](#)    Status Reports

**Presenters:**    Department of Public Utilities

PG. 169-182

**9.        PUBLIC COMMENT**

*This section of the agenda is reserved for comments from the public on any items.*

**10.      ADJOURNMENT**

If you are an individual with a disability who is in need of a reader, amplifier, qualified sign language interpreter, or any other form of auxiliary aid or service to attend or participate in the hearing or meeting, please contact the County Human Resources Division at 662-8040 at least one week prior to the meeting or as soon as possible. Public documents, including the agenda and minutes can be provided in various accessible formats. Please contact the personnel in the Department of Public Utilities (505) 662-8132 if a summary or other type of accessible format is needed.



# County of Los Alamos

## Staff Report

July 18, 2018

Los Alamos, NM 87544  
www.losalamosnm.us

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<b>Agenda No.:</b>	4.G.1
<b>Index (Council Goals):</b>	BCC - N/A
<b>Presenters:</b>	Steve Cummins, Deputy Utilities Manager - Power Supply and Rafael De LaTorre, Deputy Utilities Manager - Electric Distribution
<b>Legislative File:</b>	10417-18

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### **Title**

Quarterly Update on Electric Utility Systems & Asset Management

### **Recommended Action**

**No Recommendation, for information only.**

### **Staff Recommendation**

None

### **Body**

This quarterly update will provide a high level overview of the electric distribution system and the power production assets owned by the County. The Department of Public Utilities operates and manages the systems to serve its customers with affordable, reliable and safe electric service. This is accomplished through a mix of power generating units along with the transmission and the distribution system network to serve our customers.

The electric distribution asset management presentation is an update to what was presented in July, 2017. The update provides the strategy to managing the distribution system, recent O&M projects, update on two critical substation projects, and provides a glimpse of major issues to contend with in the future.

Electric Production will provide a high level overview of the generation assets owned by the County but operated by another party and a more in-depth overview of the assets owned and operated by the County. These assets include the San Juan Generating Station near Farmington New Mexico operated by the Public Service Company of New Mexico and the Laramie River Station located in Wheatland Wyoming operated by Basin Electric Power Cooperative. Electric Production will present the current status of the Solar PV and Battery Energy Storage System (BESS). Staff will present the findings of the BESS Use Review performed by the Grid Modernization Laboratory Consortium. Completing the asset management program, staff will dive deeper into the County owned and operated hydroelectric facilities at the Abiquiu and El Vado reservoirs located in Northern New Mexico.

### **Alternatives**

none

### **Fiscal and Staff Impact**

None, update only.

### **Attachments**

A - Electric Distribution Utility System Update July 2018

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B - Electric Production Asset Management July 2018  
C - Final LAC BESS Report

# Electric Distribution Utility System Update

By: Rafael De La Torre, PE

Deputy Utility Manager – Electric Distribution

July 18, 2018

OH  
Maintenance  
Crew



LASS Delivery  
3-02-2018



# Presentation Highlights

- Strategy for operating & maintaining the electric distribution system (3 inputs, 1 output) [page 3](#)
- Cond. Assessment, ERP & Asset Mgmt Program Highlights [pages 4-7](#)
- Underground replacement strategy, recent projects [pages 8-12](#)
- Overhead replacement strategy, recent projects [pages 13-17](#)
- LASS Substation Project Update [pages 18-20](#)
- White Rock Substation Project Update [page 21](#)
- Major overhead issues to contend with in the future [pages 22-24](#)
- Major underground issues to contend with in the future [pages 25-26](#)
- Major capital projects to contend with in the future [pages 27-32](#)
- SAIDI report card [page 33](#)
- Summary / Conclusions [page 34](#)

# Strategy for Operating and Maintaining the Electric Distribution System

- ▶ **INPUT #1 - 2006 Condition Assessment**
  - Provides condition assessment of the electric distribution system
  - Provides key input for the Electric Reliability Plan
- ▶ **INPUT #2 - Electric Reliability Plan**
  - First reliability plan developed in 2011 to address system components affecting the electric reliability;
  - ERP, Updated in 2012, then 2014
  - The goal is to achieve and maintain a SAIDI under 1 hour or less
  - Provides the strategy basis for the Asset Management Program features
- ▶ **INPUT #3 - Asset Management Program**
  - A team effort consisting of line operations (field crews), engineering, Finance & Management Staff to programmically address O&M and capital replacement projects;
  - Identify and prioritize segments of the utility grid that need to be replaced in order to achieve and maintain a SAIDI under 1 hour or less;
  - Program features for quarterly power line inspections, yearly system assessment from the linecrew's perspective;
- ▶ **OUTPUT – Proposed Bi-Annual Budget**
  - Provides annual O&M funds for both overhead and underground;
  - Funds capital projects based on DPU priorities and objectives

# Condition assessment and ERP highlights

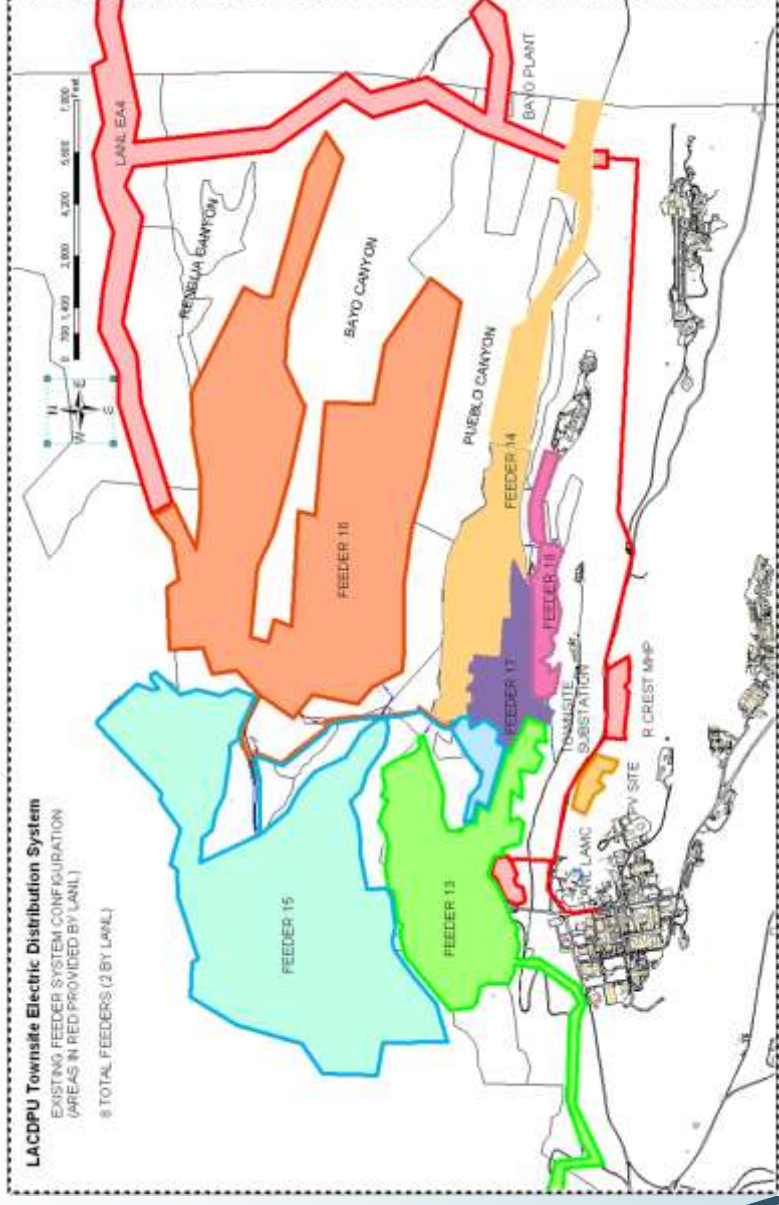
4

- **2006 Condition Brief Assessment Highlights**
  - System is 1/3 overhead, 2/3 underground
  - Most of the overhead system in Los Alamos is the original system and **operating near or past its useful 50 year life** (with the exception of portions of the system we've replaced during the last 7 years, about \$3.0M worth of projects). However, we have good O&M control, subject to funds appropriated, to keep the system going.
  - Much of the underground systems is the original system installed in the 1970s and **operating near or past its useful 40 year life**; (with exception of portions of the system we've replaced, about \$5.6M worth of projects). Again, we have good O&M and capital funds to replace SEGMENTS of the grid, or equipment, which have historically failed.
- **Electric Reliability Plan Highlights, (located in DPU website)**
  - Identifies strategy for OH; i.e. keep replacing poles until all are replaced! Priority is based on 5 year pole testing assessment by contractor, quarterly and yearly assessments by field crews;
  - Identifies strategy for UG; i.e. keep replacing segments of the grid which experienced 3 or more failures
  - Identified LASS as biggest electric reliability project, presently under construction
  - Provides other long term ED objectives including potential need for East-gate substation (near anniversary tank), expansion of SCADA system, etc. to sustain and improve the electric reliability.

# Condition assessment and ERP highlights

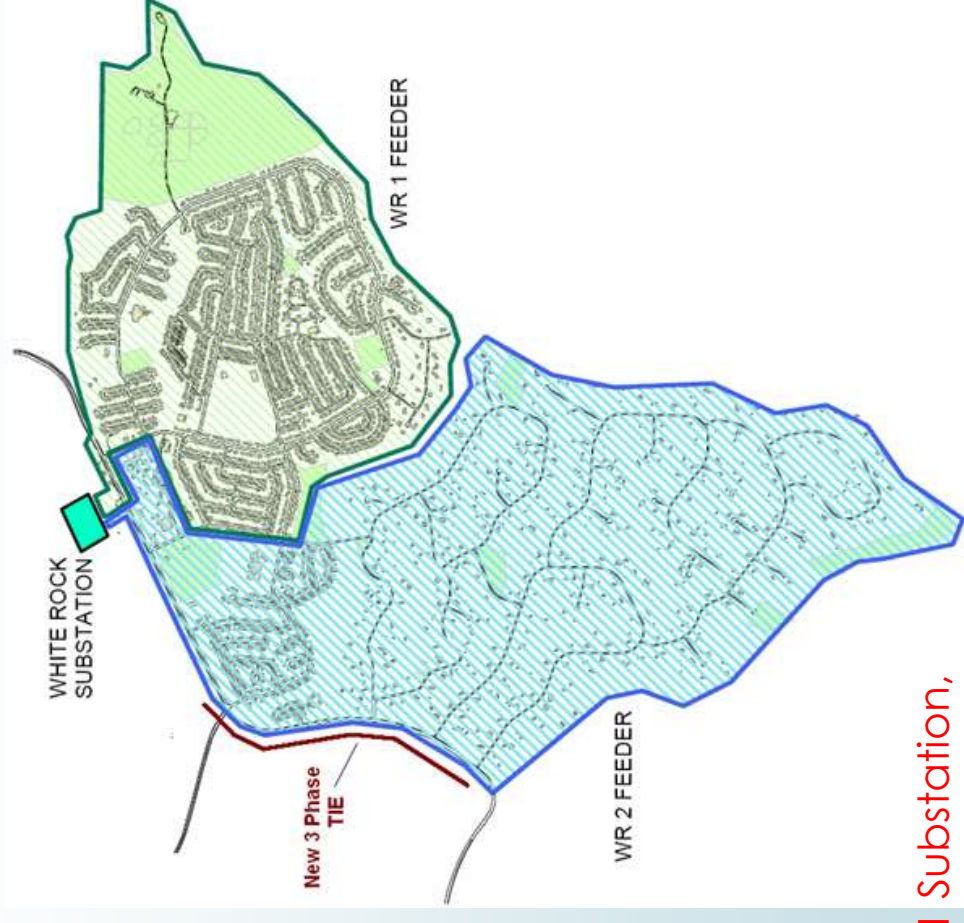
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## Los Alamos Townsite Distribution System



- 1 Substation, 6 Feeders by LAC
- Transformer & 2 Feeders by LANL

## White Rock Distribution System



- 1 Substation,
- 1 Transformers & 3 Feeders by LAC

# Asset Mgmt Program & Budget highlights

6

## ■ Asset Management Program Highlights

- Field crews (linemen) provide information about the electric grid from their perspective since they work with it daily; they submit annually their priority O&M items and feeder handi-capps; we have 10 feeders for 10 linemen
- AMT team analyzes all submittals and ranks them based on priority; highest priority is # of failures and # of customers affected;
- Develops an annual presentation for AMT, Department Meeting PRIOR to budget

## ■ Bi-Annual Budget with 10 Year Outlook Highlights

- Provides \$300K yearly for UG and \$300K for underground and overhead system maintenance projects;
- Funds capital projects based on DPU priorities and objectives; however, sometimes priorities are based on County objectives; for example, redoing electric when County has major road resurfacing or rebuilds (logical to do but sometimes ED priority projects are pushed back - not complaining but it's a fact!)
- Provides 10 year outlook on other major O&M or capital projects, gets updated every year but is good to have the outlook for planning and budgeting purposes
- NO doubt, the funds have been available for the last 7 years to aggressively undertake the O&M and capital projects to improve the electrical reliability and achieve the SAIDI goal

# Asset Mgmt Program Work Calendar

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## 2017-2018 Assessment Priorities

CIRCUIT RANK	DESCRIPTION	ED PROJECT	PURPOSE
13-1-1	TWO SWITCHES ON SANDIA		(STRESS CONE) TYPE TERMINATIONS ARE TRACKING
13-1-2	NEED TO REPLACE TRANSFORMERS 725 AND 726		TRANSFORMER BANK
13-1-3	NEED TO RELOCATE TRANS 1058, 1059, 1060 TO SIDEWALK	ED2127	TRANSFORMERS BEHIND APARTMENTS
13-1-4	NEED TO INSTALL SWITCH CABINET IN PLACE OF VAULT	ED2107	WIRES ARE STACKED AND LAYING ON THE BOTTOM
13-2-1	REPLACE 1000' 3 500MCM SUB TO OPPENHEIMER		SECTION HAS HAD A FAILURE AND IS OVER 25 YEARS OLD
13-2-2	REPLACE OH POLES ALONG ORANGE		BACKFEED TO CIRCUIT 15
13-2-3	NEED TO INSTALL CABLE ON DIAMOND		TO COMPLETE DIAMOND UNDERGROUND
14-1-1	REPLACE AIRPORT J-BOX	ED2115	REPLACE WITH FLUSH MOUNT
14-1-2	REPLACE 1300' OF 500MCM SUBSTATION TO DEACON STREET		SECTION IS OVER 25 YEARS OLD
14-1-3	REPLACE 15TH AND IRIS SWITCH		LIVE FRONT SWITCH
14-1-4	REPLACE YMCA SWITCH		LIVE FRONT SWITCH
14-1-5	REPLACE YMCA TRANSFORMER		LIVE FRONT TRANSFORMER
14-1-6	RUN NEW FEED TO SOMBRILLO SWITCH		SWITCH IS BEING FED 1/0 WIRE
14-1-7	REPLACE EASTGATE SWITCH		OLD LAB SWITCH WITH STEEL CABINETS
14-2-3	REPLACE TRANS: 852,969,787,788,972,968,970,1117		LIVE FRONT AND OVER 25 YEARS OLD
14-2-3	SHANNON SWITCH INSTALL JUNCTION AND REMOVE SC20505	ED2115	completed
15-1-1	REPLACE POLE AT NORTH ROAD AND CANYON GLENN	ED7903	A7 PP3466
15-1-1	INSTALL SWITCH AT FIRE STATION ON DIAMOND	ED2107	CICUIT IS OPENING ALL THE WAY BACK TO WOODLAND
15-1-2	INSTALL SWITCH TO TIE CIRCUIT 13 AND 15 ON NORTH RD	ED2115	ACCESS ISSUES WITH SWITH ON RIDGEWAY
16-1-1	TSANKAWI PRIMARY REPLACEMENT	ED7906	MULTIPLE FAULTS
16-1-2	REINSULATE AND RECONDUCTOR BACKFEED AT BALL FIELDS	ED2015	WIRE IS #6 COPPER
16-1-3	INSTALL PRIMARY J-BOXES AT BROADVIEW ESTATES	ED2115	PRIMARY JUNCTIONS ARE INSIDE SECONDARY FLUSH MOUNTS
16-1-4	INSTALL PRIMARY J-BOXES AT CORNER OF KRISTILN AND BROADVIEW		EXISTING PEDS ARE SMALL AND OUT DATED
16-1-5	INSTALL PRIMARY J-BOXES AT CORNER OF TIFFANY AND BROADVIEW		EXISTING PEDS ARE SMALL AND OUT DATED
16-1-6	INSTALL LOOP FEED FOR TOTAVI		TOTAVI IS A RADIAL RUN
16-2-2	REPLACE 11 PHASE PRIMARY LOS PUEBLOS : 2000' TOTAL		SECTION HAS HAD MULTIPLE FAILURES
18-1-1	REPLACE 1400' 500MCM FROM 1745 TO 901 TRINITY		EXPAND NEW FEEDER 18 TO TRINITY SITE
EA4-1-1	REPLACE MULTIPLE POLES AND CROSSARMS	ED2013	STRUCTURES ARE > 20 YEARS OLD
17-1-1	REPLACE MULTIPLE THREE PHASE LATERALS TO TRANS		CONDUCTORS ARE > 20 YEARS OLD
			completed
WR1-1-1	REPLACE 4000' 1-PHASE PRIMARY: CHERYL CT, CONNIE		CONDUCTORS ARE > 20 YEARS OLD: MULTIPLE LINE FAILURES
WR1-1-2	REPLACE 4 PADMOUNT SWITCHES ON ARAGON AVE.	NO BUDGET	SWITCHES ARE > 20 YEARS OLD
WR1-1-3	CHANGE OUT TRANSFORMER P3631 AT DNCU MALL	ED2107	TRANSFORMER IS THREE PHASE LIVE FRONT
WR2-1-1	CONDUCTOR REPLACEMENT LA SENDA & PIEDRA LOOP		MULTIPLE FAULTS ON LINE SECTION
WR2-1-2	REPLACE CONDUCTOR VALLE DEL SOL		MULTIPLE FAULTS ON LINE SECTION

These are the short-term and long-term projects identified by linemen's inspections & assessments for their respective feeders;

They are based on AMT program features;

Projects are prioritized based on: # of failures, # of customers affected,

AND subject to funds available.

# UG (underground) replacement strategy

Replace segments of the grid that have multiple failures, priority based on number of customers served, critical load, etc.

Place under category URD REPLACEMENTS		Annual Budget
Line segment replacements after 3 failures; live front replacements		
White Rock		\$300,000
Los Alamos		\$300,000
Subtotal UG		\$600,000

- Major Project Highlights since last year
  - Rebuild the UG system at LAMC, cost about \$80K; non-priority project that became a priority;
  - Loma Vista/Oppenheimer, cost about \$40K; non-priority project that became a priority;
  - Rim Road replacement and loop addition \$80K; priority project from work calendar;
  - Multiple live-front transformer replacements in White Rock; priority project from work calendar

# LAMC rebuild (replaced segments in red)

Cost \$85K



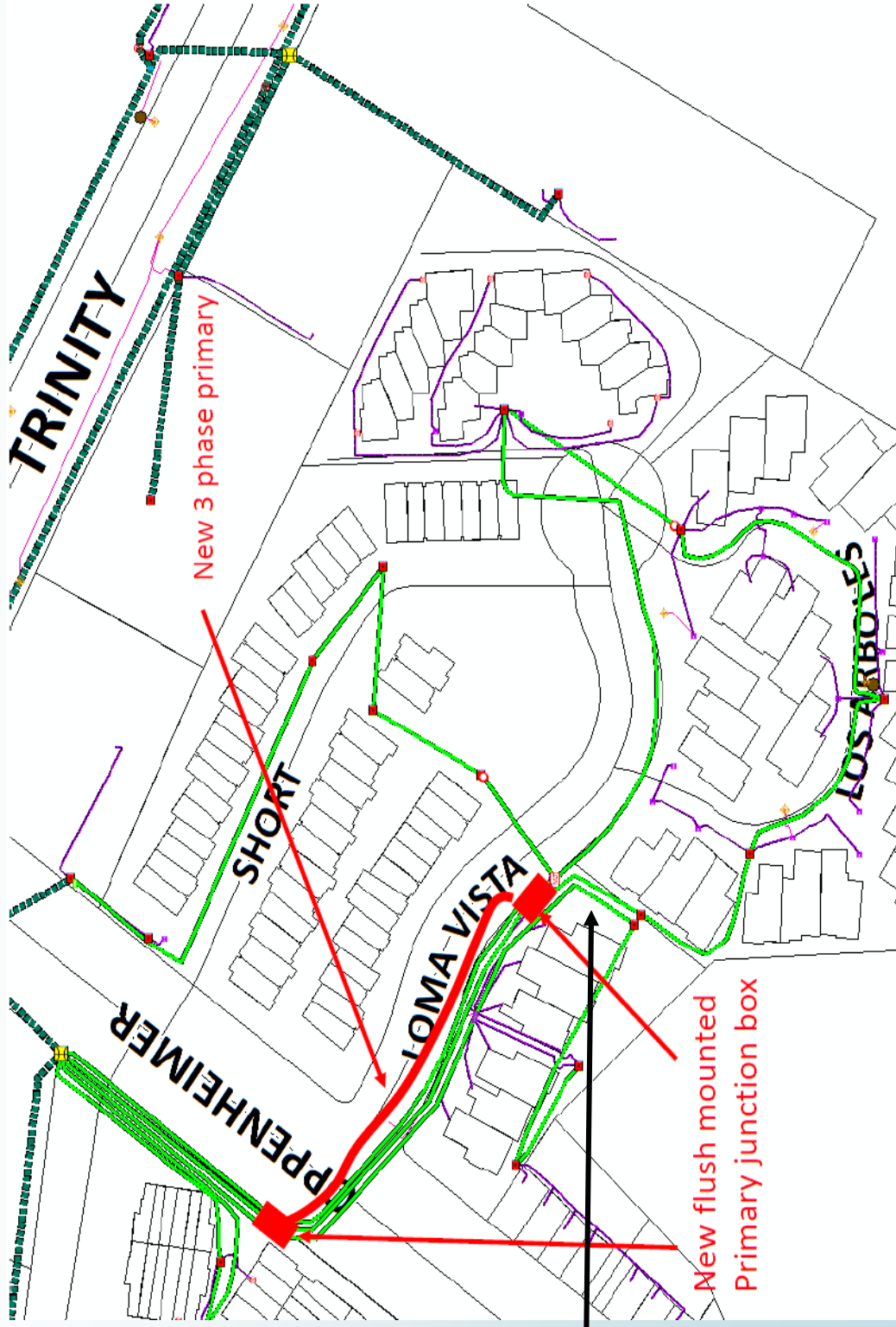
(Installed primary above ground during repairs)



# Loma Vista rebuild

(replaced segments in red)

Cost \$45K



(Installed primary above ground during repairs)



# Rim Road UG rebuild

UNDERWAY!

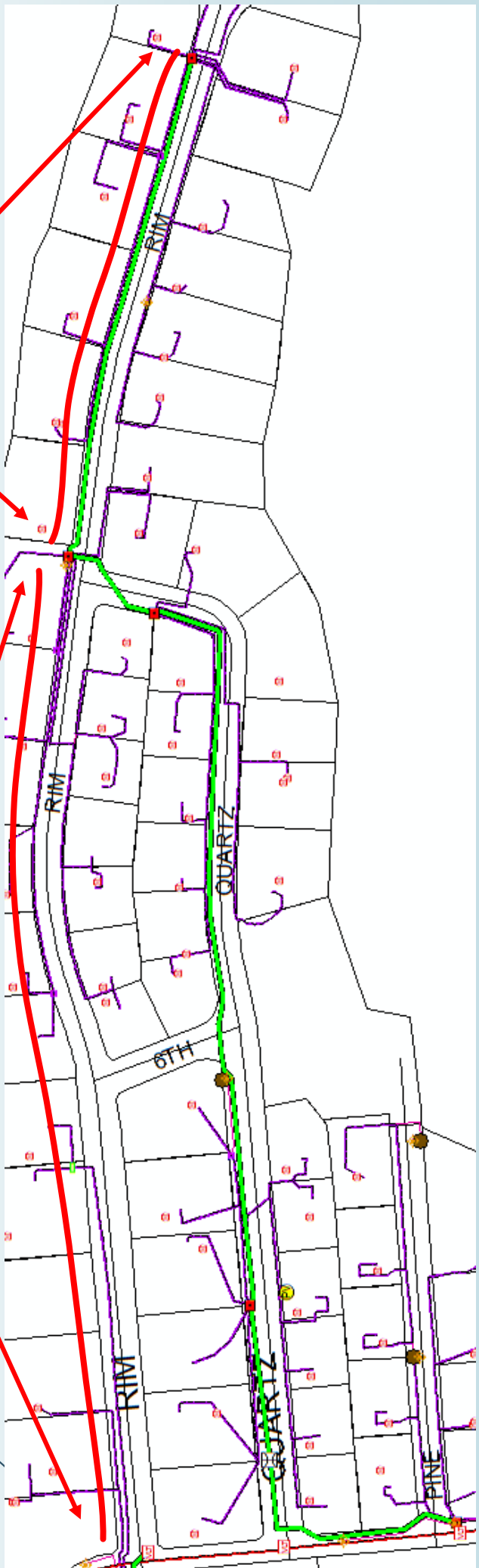
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Cost \$80K

Rim road;  
Add 1300 ft. loop and replace 700ft of single phase  
(2 lines) due to numerous and past UG failures

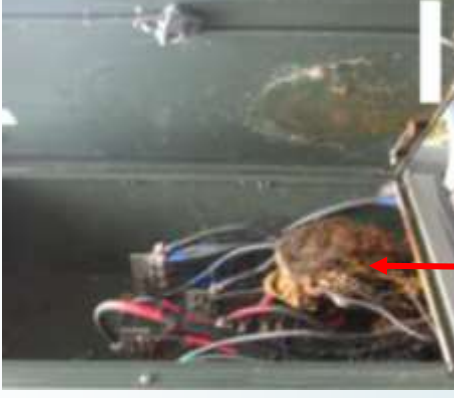
Add new Loop and  
transformers

Replace Line



# Live-front transformer replacements (one type of maintenance)

Cost \$4K per trans



Critter?  
Inside live-  
front



13,200 volts  
behind this  
cover

BEFORE



AFTER



# OH (overhead) replacement strategy

Eventually replace all poles and overhead conductor in the grid because of age, priority based on 3 phase backbone system, etc.

OVERHEAD SYSTEM REPLACEMENTS		Annual Budget
Poles, cross-arms, open secondary, etc. White Rock		\$200,000
Los Alamos		\$200,000
	Subtotal OH	\$400,000

- **Major Project Highlights since last year**
  - Replaced all **primary poles** that were rejected from last audit (30);
  - Working on replacing the **service poles and street light poles** from the last audit (60);
  - Retired “**open secondary**” **street light circuit** strung beneath the primary system by installing 1KVA transformers for the street light circuit; mainly the Barranca Mesa area;
  - **Trees, trees, trees!** The clearing of tree obstructions near and around power lines has become a year long effort costing about \$100K per year.

# Retire street light circuit (revamps)

(one type of maintenance)

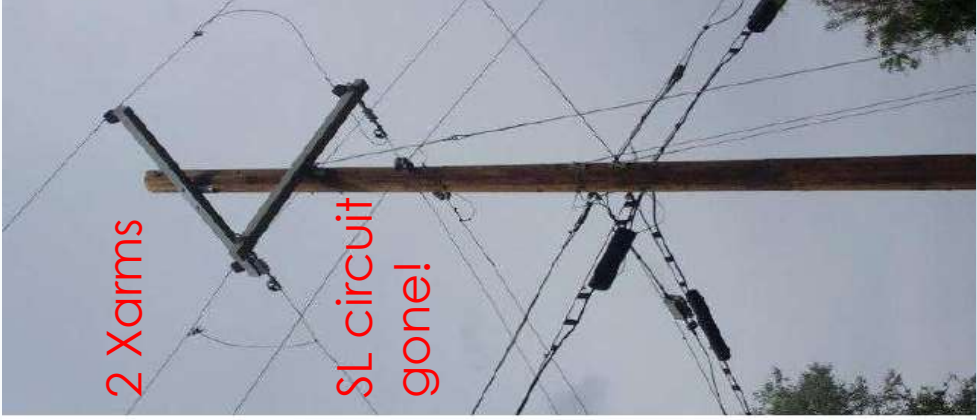
BEFORE



8 Xarms

SL circuit

AFTER



2 Xarms

SL circuit  
gone!

BEFORE



2 Xarms

SL circuit

AFTER



1 Xarm

SL circuit  
Goneby adding  
1 KVA

# Retire street light circuit revamp map



# Transformer replacement, rid of 2 trans for 3 phase power (revamps) (another type of maintenance)

Cost \$4K-8K per pole

2 trans for 3 phase power,  
open wye, open delta



3 trans for 3 phase  
power, standard delta



7 wood X-arms



2 fiberglass X-arms

# Trees are becoming a year round problem!

We utilize on-call contractor but also spend a significant amount of in-house manpower as required

Cost \$80K-\$100K per year

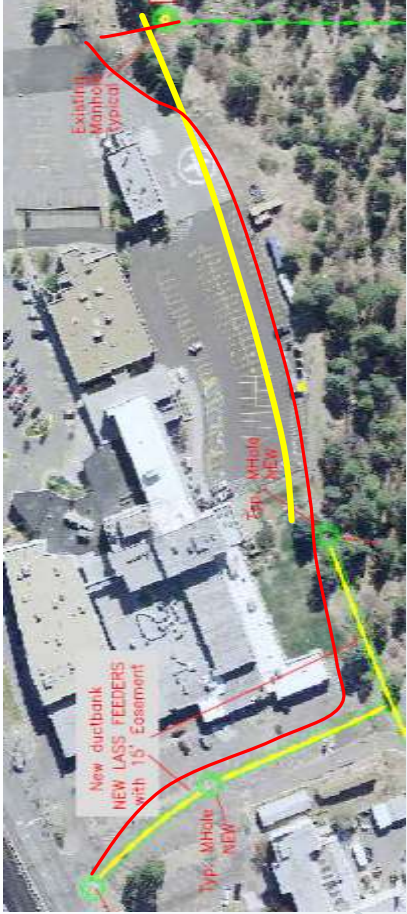


Very large trees near or outside of right-of-way is a new problem, some cost \$1K to \$2K to topple each

# LASS Ductbank Addition (progress)

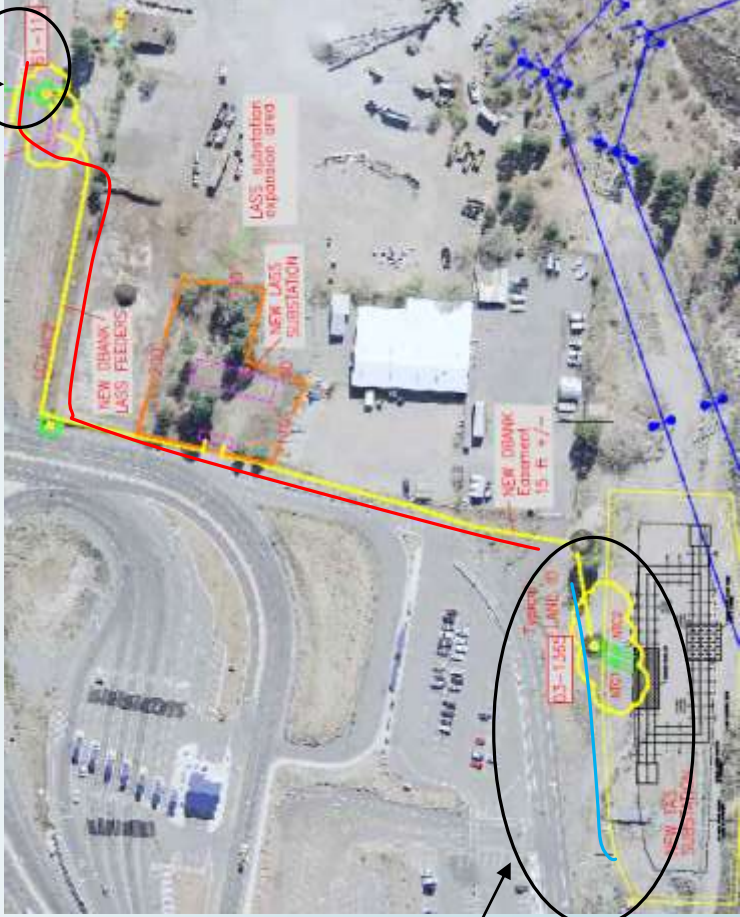
Cost \$2700K

Red line route is completed portion of ductbank



North side of bridge

E. Jemez MH intercept



South side of bridge

300 ft. that we lack until after TA-3 project concludes



# LASS conductor install (progress)

19



## LASS Substation Update (progress)

### ■ Still Underway

- LASS delivered in March and temporarily powered;
- Started installing (6) get-away feeders out of the substation;
- Need to construct about 300 feet of ductbank into the new TA-3 substation but after the TA-3 Project concludes;
- Need to intercept the ductbank crossing LA Canyon at East Jemez Road after the TA-3 Project concludes;
- Waiting on TA-3 Project to provide its relay protection settings; i.e. “upstream devices” so that LAC can coordinate its “downstream devices”;
- Neutral Reactor issue has been exhausting to implement with the TA-3 Project but it looks like there is a path forward between LAC/LANL Utilities;
- Installing new LC1, LC2 Feeders from new TA-3 Substation to power LASS will be a LAC/LANL Utilities effort after the TA-3 Project concludes;
- LAC has little to no control over construction time-lines since the majority of the LASS project is on DOE land and NNSA/LANL work jurisdiction;

## White Rock Substation Upgrade (progress)



Cost \$800K

**PROJECT IS UNDERWAY!**  
Expect to complete Jan, 2019

Replace 15KV switchgear with new;  
Rid of 115KV fuses and add new circuit  
switcher (breaker + relay);



# Major OH issues to contend with in the future

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## ■ Overhead System

- Need to have the project funds to continue with O&M strategy until all poles > 50 years of age are replaced;
- At some point the overhead wire will need to be replaced, 90% of the wire in air is CWC or HD copper. For comparison purposes, RUS construction standards target these power lines for replacement (due to age). The standard wire of today (and long ago) has been ACSR;
- Replacing the EA4 feeder, perhaps in segments; within 3-5 years;
- Need to have project funds to continue with tree-trimming program; the need for tree-trimming is becoming a year round issue.

# OH Pole & X-arm Replacement (ongoing)



Before



After



New fiberglass X-arms



Before

Loose hardware can cause this



# OH Pole & X-arm Replacement (ongoing)



Backyard Unit  
For difficult  
access



# Major UG issues to contend with in the future

## ► **Underground System**

- Need to have the project funds to continue with URD replacement projects for SEGMENTS of the grid that we know will fail or have failed several times;
- The Los Pueblos power line will need to be replaced sometime in the near future;

## Major UG powerline to replace in the near future

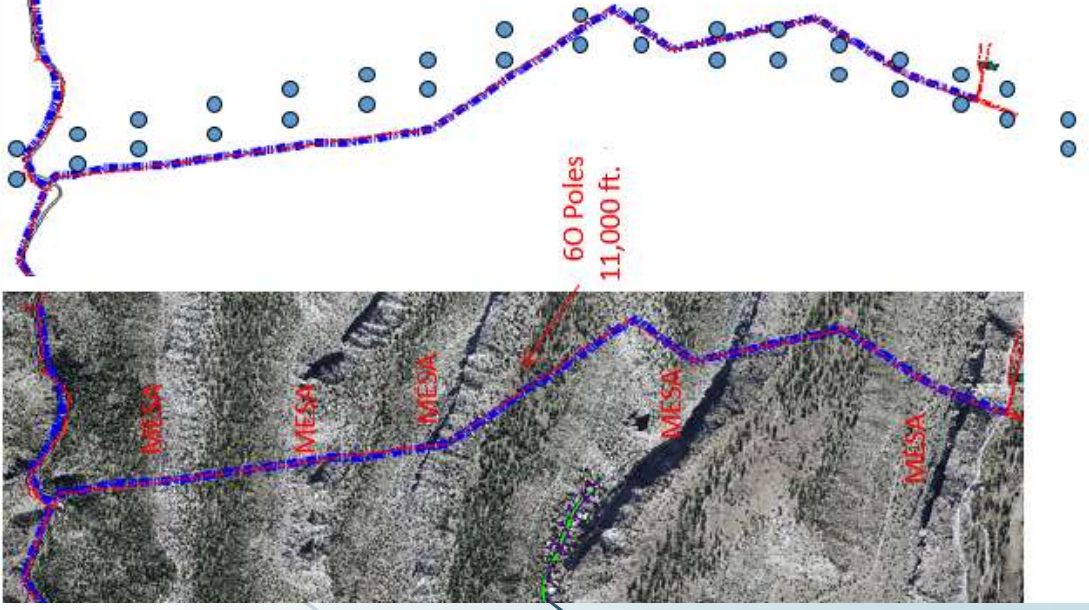


# Major Capital Projects to contend with in the future

- **Major Projects subject to development of major loads**
  - EA4 Feeder Replacement Project between PCS and Rendija Canyon may cost \$1.7M; we need to target this power line for replacement within 3-5 years;
  - May require the Eastgate Substation if and when DP Road develops for major development;
  - May require a substation near Research Park on LANL side; over the years, we've had meetings on potential 5MW to 10MW load

# EA4 Feeder Replacement

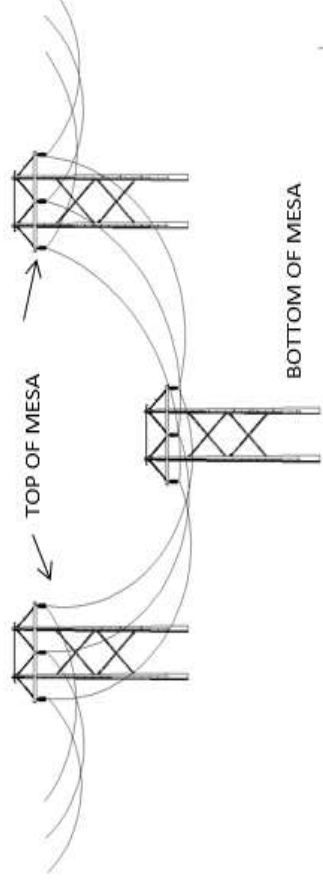
- EA4 Feeder Replacement, 2.5 mile EA4 Feeder design will be underway and replacement cost will be developed;
- This Feeder primarily serves the waste water and water production group, but also Totave;



- There are presently **60 pole** structures
- Most are 2 or 3 pole H-type deadends (expensive)



- Proposed Design (< **20 pole** H structures)
- Utilize transmission types structures to span the canyons



# EA4 Conceptual Canyon Crossing



From PCS looking  
North, first structure

Looking from North Mesa  
East

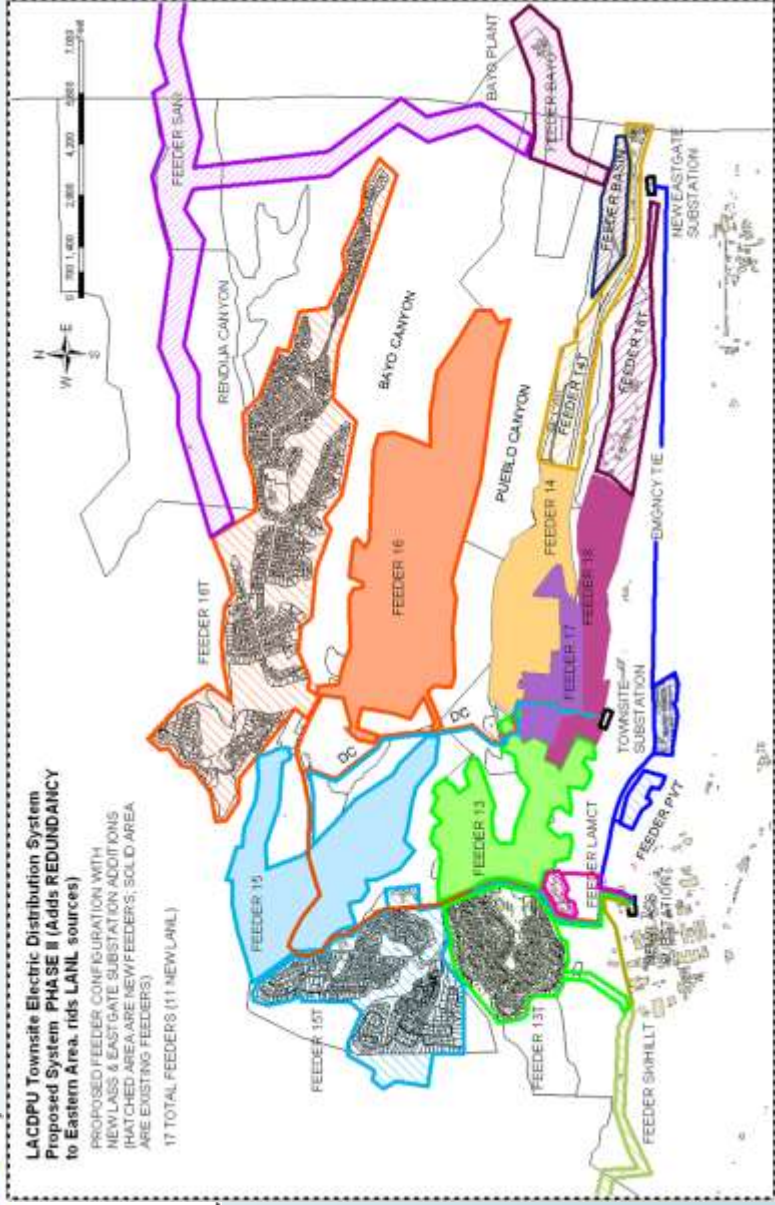
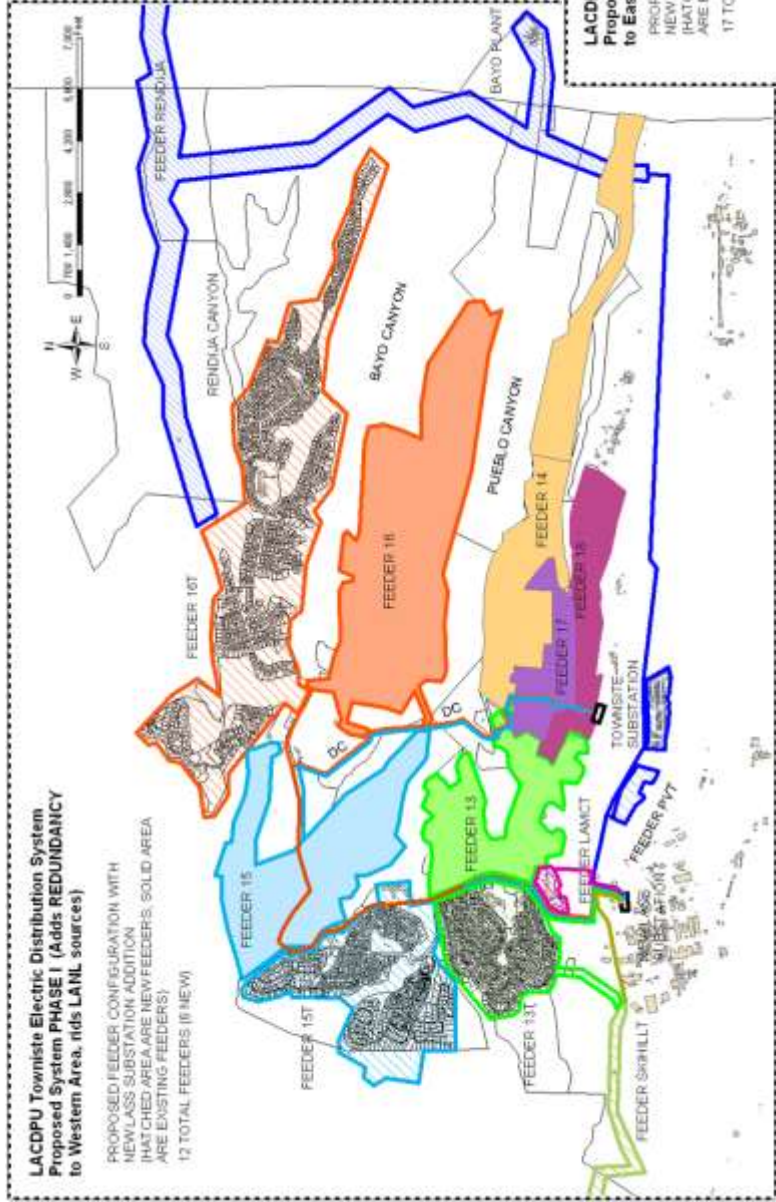


Looking from Los Pueblos  
East



# THIS IS WHERE WE WANT TO BE

## LASS SUBSTATION ADDITION (Underway)



## EASTGATE SUBSTATION ADDITION

(depends on DP Road development)



# Research Park Substation?

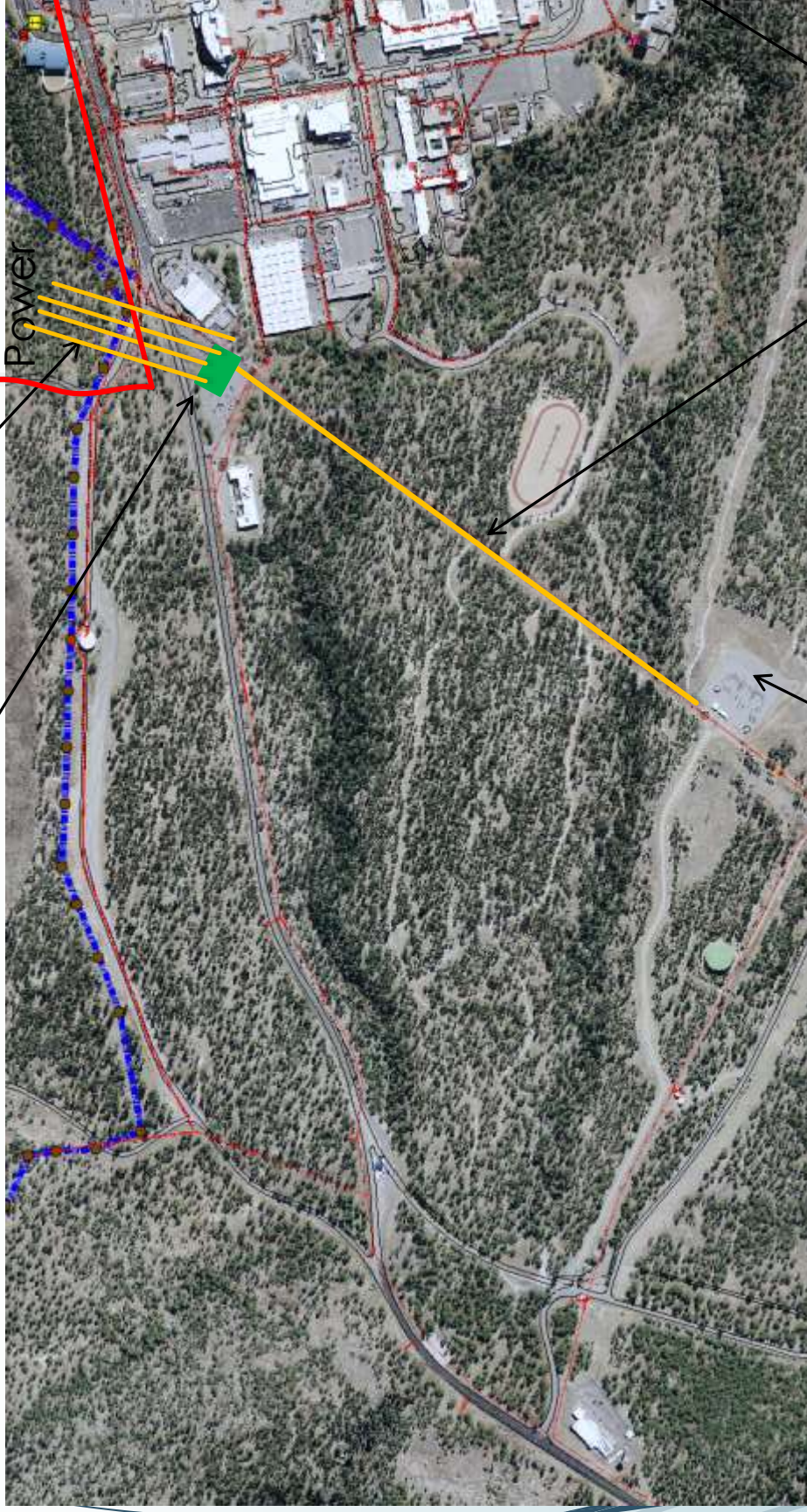
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Power request for  
10MW to 15MW Load  
Addition near LA  
Research Park

Project  
Area Need for  
Power

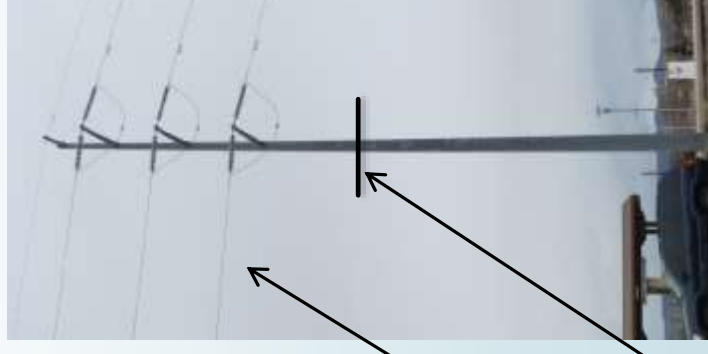
New SUB  
20MVA

New UG  
Feeders

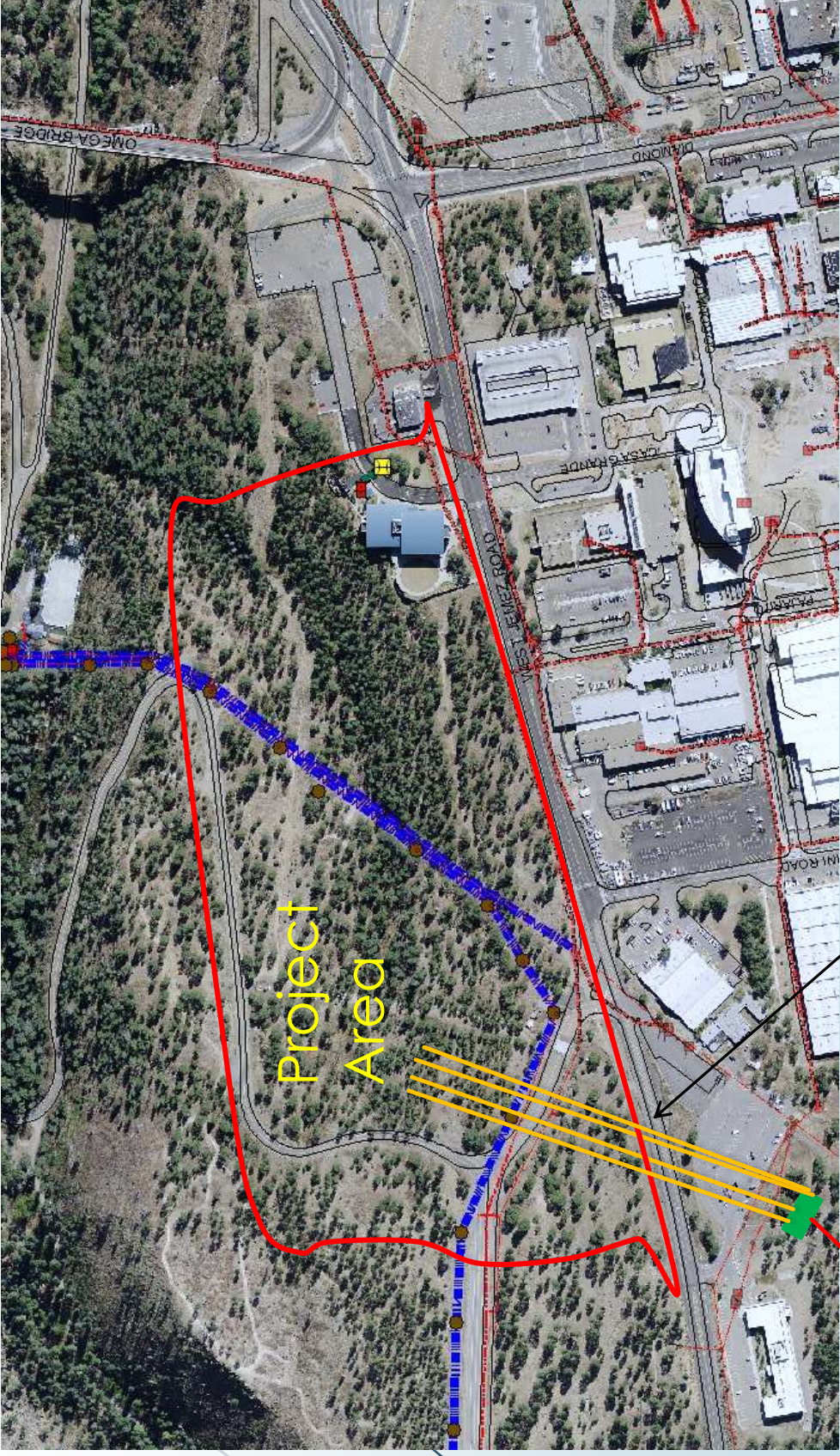


LANL'S/  
WTA SUB

New 115KV OH Transmission  
with 15KV distribution  
underbuild within existing  
corridor



# Research Park Substation? A CLOSER VIEW

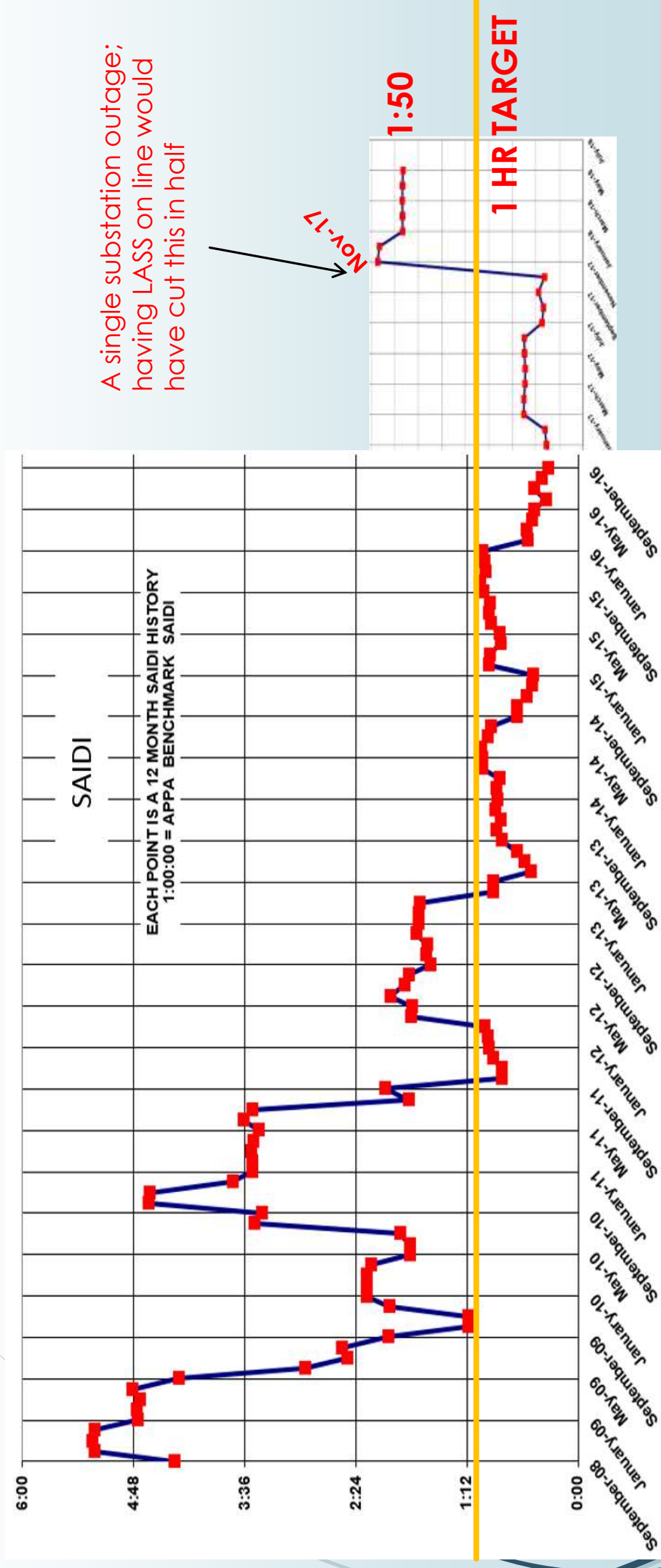


New UG  
Feeders

New SUB 20MVA

# One Report Card, what we're doing is working!

33



A single substation outage;  
having LASS on line would  
have cut this in half

# Summary / Conclusions

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- The department's replacement strategy for the OH and UG system under the Asset Management Program features is working;
- The need for annual (\$800K) O&M replacement funds is necessary in order to maintain system reliability;
- Trees are becoming a \$100K year-round problem;
- The need for Capital Project funds may be necessary in the next 3-4 years to replace the EA4 Feeder and or portions of the overhead system conductors;
- The construction of LASS will alleviate and greatly improve the system by providing redundancy to western Los Alamos and additional capacity to Los Alamos;
- Future load growth potential along DP road may require the construction of the Eastgate substation;
- Future load growth near the LA Research Park may require the construction of a new substation;
- **All of the projects and costs mentioned in this update are required for maintaining and improving the system reliability. Furthermore, these costs need to be shared equally by all customers, including PV customers, which benefit from the use of a reliable electrical distribution grid.**

# Electric Production Asset Management

July 18, 2018  
Board of Public Utilities  
Informational Meeting

# Electric Production Assets

1. San Juan Generating Station
2. Laramie River Station
3. Solar PV
4. Battery Energy Storage System
5. Abiquiu Hydro Electric Plant
6. El Vado Hydro Electric Plant
7. 10 Year Capital Improvement Plan
8. 69 kV Transmission Line

# San Juan Generating Station

- ❖ **San Juan Unit Four (SJ)**
  - ❖ 507 Megawatt rated capacity
  - ❖ 7.2 % undivided interest or
  - ❖ 36 Mw at max net capacity



# San Juan Generating Station

- 2017 EAF 88%
- Project Participation Agreement expires June 30, 2022
- LAC has notified Operating Agent (PNM) per the contract, regarding LAC plans to exit the station on June 30, 2022
- Staff will issue a Purchase Power Agreement RFP this fall for the remaining term of the Electric Coordination Agreement (July 1, 2022 to June 30, 2025) for replacement power.

# Laramie River Station



## ❖ Laramie River Station

- ❖ 10 Mw via a life-of-plant contract with
- ❖ Lincoln Electric System

# Laramie River Station

- 2017 EAF 89%
- Life of Plant Participation Power Sales Agreement

## **Regional Haze (SCR/SNCR) Project Report:**

- Unit 1 SCR work is \$220.1 million.
- Unit's 2 & 3 SNCR installation is \$40.2 million.
- Project Costs expensed over three years (2017 – 2019)

# Solar PV



- ❖ **Los Alamos Utility Scale Solar**
  - ❖ 1 MW Installed capacity
  - ❖ 2017 Annual Generation 1,592,043 kWh
  - ❖ Grounds maintenance, weed control
  - ❖ HVAC filter replacement
  - ❖ Air Condition & Heating Company, Santa Fe
- New Mexico, bi-annual site maintenance

# Battery Storage

Lead Acid Battery  
800 kW, 2.3 MWh



Sodium Sulfur Battery  
1 MW, 6 MWh



# Battery Storage

- Los Alamos County Battery Energy Storage System Use Review July 2018
- This research was supported by the Grid Modernization Initiative of the U.S. Department of Energy as part of its Grid Modernization Laboratory Consortium, a strategic partnership between DOE and the national laboratories to bring together leading experts, technologies, and resources to collaborate on the goal of modernizing the nation's grid.
- Final Report completion expected in July 2018

# Battery Storage Applications

- Operating Reserves
- Performing Arbitrage (time shifting)
- Peak Shaving
- PV Firming
- Power Quality
- Uninterruptible Power Supply
- Transmission & Distribution Deferrals
- Mitigating Generation and Energy Delivery Imbalances

# BESS Potential Savings

Service	Cost of Service (kW/yr)	Potential Gross NaS Savings (@ 1 MW)	Estimated Savings Using NaS BESS Alone	Potential Gross Pb-acid Savings (@600kW)	Estimated Net Savings Using Pb-a BESS Alone	Potential Gross Combined Savings	Estimated Net Savings Using NaS and Pb-acid BESS
Spinning Reserve (Schedule 5)	*						
Supplemental Reserve (Schedule 6)	*						
Regulation and Frequency Response (schedule 3)	\$103.70	\$103,700	\$33,700	\$62,200	\$28,200	\$165,900	\$83,900

# Conclusion & Further Consideration

- Regulation & Frequency Response could potentially have a net savings
- Determine if the control system cost can be shared with other utility functions
- Consider selling the BESS to avoid the anticipated disposal cost estimated at \$500,000

# Los Alamos County Hydroelectric Generating Stations

Abiquiu 3 Units – 17 MW  
combined capacity



El Vado 1 Unit - 8.8 MW Capacity



# Hydroelectric Plants

- The Incorporated County of Los Alamos Department of Public Utilities (DPU) owns and operates two run of the river hydroelectric plants on the Rio Chama in northern New Mexico.
- The El Vado hydroelectric plant is located 14 miles west of Tierra Amarilla, NM at the El Vado Dam which is operated by the U.S. Bureau of Reclamation.
- The Abiquiu hydroelectric plant is located in Abiquiu, NM at the Abiquiu Dam which is owned and operated by the U. S. Army Corps of Engineers.

# Hydroelectric Plants

- Los Alamos County operates both plants under the provisions set forth in a Memorandum of Agreement with the dam operator for each plant.
- The Federal Energy Regulatory Commission (FERC) has jurisdiction over both plants.

# Abiquiu

- The Abiquiu hydroelectric plant was commissioned in 1989. A third low-flow unit was commissioned in 2011. The Abiquiu project is operated under FERC Permit No. 7396.
- Characteristics of the Abiquiu hydroelectric plant are provided below.

Abiquiu	Unit 1	Unit 2	Unit 3
Type	Francis	Francis	Francis horizontal
RPM	400	400	513
Rated Head	174 Feet	174 Feet	170 Feet
Flow Range	235-550 CFS	235-550 CFS	75-235 CFS
Turbine	Harbin (Chinese)	Harbin (Chinese)	Andritz
Commissioned	1989	1989	2011
Generator	Harbin (Chinese)	Harbin (Chinese)	Indar
Rated Power	6.9MW	6.9MW	3.1MW
Rated Voltage	4160	4160	4160

# El Vado

- The El Vado hydroelectric plant was commissioned in 1987. The El Vado project is operated under FERC Permit No. 5226.
- Characteristics of the El Vado hydroelectric plant are provided below.

El Vado	Unit 1
Type	Kaplan
RPM	300
Rated Head	105 Feet
Flow Range	200-1000 CFS
Turbine	Voith
Commissioned	1987
Generator	National Industries
Rated Power	8.8 MW
Rated Voltage	4160

# Hydroelectric Plant Operations

- The two hydroelectric plants are staffed with three operators/maintainers.
- All three operators support both plants and work between the two plants as needed. The plants are normally staffed from 7:00AM to 4:30 PM Monday through Friday and one plant operator is on-call after hours and weekends.
- The plants are monitored and operated after hours from the Los Alamos County Electric Dispatch Center located in Los Alamos, NM. Remote operation and monitoring capabilities are through a Supervisory Controls And Data Acquisition system (SCADA) owned and operated by Los Alamos County with the exception of sharing two microwave links with regional transmission line operators.
- Los Alamos County employs two full time SCADA Coordinators responsible for maintenance and emergency response to the SCADA system.

# Hydroelectric Plant Asset Management

- The hydroelectric plant operations, maintenance, regulatory compliance, stakeholder coordination and planning is administered through an asset management team that consists of the department manager, plant operation staff, SCADA coordinator and engineering department representative.
- The team meets quarterly to plan, coordinate resources and assess plant operational and equipment needs to optimize plant efficiency, prioritize efforts and justify operational and capital budgets annually, including a 10-year capital plan.
- Asset management tools used to schedule and track efforts consists of HydroAMP for assessment of major plant components, MPRO 2000 PLUS for scheduling maintenance of equipment, daily walkthrough checklists and a facility maintenance schedule.
- HydroAMP Asset Management is a public domain risk-based condition assessment and economic analysis tool developed and used by the US Bureau of Reclamation, US Army Corps of Engineers, Bonneville Power and Hydro Quebec. The DPU implemented HydroAMP for asset management of the El Vado and Abiquiu hydroelectric plants in 2008. The industry acceptance, systematic approach and database management component aligned well with the DPU's asset management goals.

# Abiquiu Equipment Condition Index

Abiquiu – HydroAMP Condition Assessment				
Tier 1 Equipment	Manufacturer	Placed In Service	Condition Index	
Batteries	C&D	2017	10 / GOOD	
Compressed Air System	Gardner Denver	1989	7.0 / FAIR	
Crane - 60 Ton Overhead	Gaffey	1997	10 / GOOD	
Emergency Closure Gate - Bypass Cone Valve #1 Service	Kabota	1989	9.9 / GOOD	
Emergency Closure Gate - Bypass Cone Valve #2	Kabota	1989	9.9 / GOOD	
Emergency Closure Gate - Tunnel Gate	ZWAG (Swiss)	1989	9.9 / GOOD	
Transformer	ASEA Electric	1989	9.91 / GOOD	
Circuit Breaker Air Unit 1	Siemens	2014	10 / GOOD	
Emergency Closure Butterfly Valve - Unit #1	Harbin Equipment Package	1989	8.2 / GOOD	
Emergency Closure Gate - Draft Tube Gate Unit #1	Telluride Iron Works	1989	8.5 / GOOD	
Excitation System Unit #1	Basler	2005	10 / GOOD	
Generator Rotor Unit #1	Harbin	1989	9.02 / GOOD	
Generator Stator Unit #1	Harbin	1989	8.42 / GOOD	
Governor Unit #1	HPS	2003 Digital	10 / GOOD	
Turbine Unit #1	Harbin	1989	4.75 / FAIR	
Circuit Breaker Air Unit 2	Siemens	2014	10 / GOOD	
Emergency Closure Butterfly Valve - Unit #2	Harbin Equipment Package	1989	8.2 / GOOD	
Emergency Closure Gate - Draft Tube Gate Unit #2	Telluride Iron Works	1989	8.5 / GOOD	
Excitation System Unit #2	Basler	2005	10 / GOOD	
Generator Rotor Unit #2	Harbin	1989	9.02 / GOOD	
Generator Stator Unit #2	Harbin	1989	8.42 / GOOD	
Governor Unit #2	HPS	2003 Digital	10 / GOOD	
Turbine Unit #2	Harbin	1989	8.75 / GOOD	
Condition Index (CI)				
7 - 10 GOOD				
3 - 7 FAIR				
0 - 3 POOR				

Condition Assessment Summary Turbine Abiquiu Turbine Tier 1 and Tier 2

TURBINE  
TIER 1 CONDITION ASSESSMENT SUMMARY

Date: OCTOBER 2012 Location: Abiquiu - Unit 1  
Turbine Identifier: Unit 1 Manufacturer: HARBIN Yr. Mfd.: 1986

Tier 1 Turbine Condition Summary (For instructions on indicator scoring, please refer to condition assessment guide)				
No.	Condition Indicator	Score	Weighting Factor	Total Score
1	Age (Score must be 0, 1, 2, or 3)	3	0.667	2.001
2	Physical Condition (Score must be 0, 1, 2, 3, or 4)	1	1.250	1.250
3	Operations (Score must be 0, 0.5, 1, or 1.5)	1	1.000	1.000
4	Maintenance (Score must be 0, 0.5, 1, or 1.5)	1	1.000	1.000
Tier 1 Turbine Condition Index (Sum of Individual Total Scores) (Condition Index should be between 0 and 10)				5.250

Tier 1 Turbine Data Quality Indicator (Value must be 0, 4, 7, or 10)	10
---	----

Evaluator: R. ADAMS / S. REISER Technical Review: R. ADAMS  
Management Review: S. REISER Copies to: S. REISER

(Attach supporting documentation.)

Turbine Condition-Based Alternatives	
Condition Index	Suggested Course of Action
≥ 7.0 and ≤ 10 (Good)	Continue O & M without restriction. Repeat or update Tier 1 condition assessment during next scheduled maintenance outage.
≥ 3.0 and < 7 (Fair)	Continue O & M without restriction. Schedule a Tier 2 assessment in 4 years or less.
> 0 and < 3.0 (Poor)	Schedule a Tier 2 assessment in 1 year.

E6-16

TURBINE  
TIER 2 CONDITION ASSESSMENT SUMMARY

Date: OCTOBER 2012 Location: Abiquiu  
Turbine Identifier: Unit 1 Manufacturer: HARBIN Yr. Mfd.: 1986

Tier 2 Turbine Condition Summary		
No.	Tier 2 Test	Individual Adjustments to Tier 1 Condition Index
T2.1	Efficiency	<del>0.50</del> N/A
T2.2	Capacity	N/A
T2.3	Off-Design	N/A
T2.4	Paint Film Quality	+0.5
T2.5	Surface Roughness	0
T2.6	Cracking	-1.0
T2.7	Cavitation	-0.5
T2.8	Condition of Remaining Parts	+0.2
T2.9	Environmental	0
T2.10	Operating Conditions	+0.2
T2.11	Maintenance	+0.2
T2.12	Other Specialized Diagnostic Tests	N/A
Tier 2 Adjustments to Turbine Condition Index (Sum of Individual Adjustments)		Sum: -0.5 <del>Adjusted</del> (≥ 0 and ≤ 10)

Tier 2 Data Quality Indicator (Value must be 0, 4, 7, or 10)	10
---	----

To calculate the Net Turbine Condition Index (Value should be between 0 and 10), subtract the Tier 2 Adjustments from the Tier 1 Turbine Condition Index:

Tier 1 Turbine Condition Index 5.250  
minus Tier 2 Turbine Adjustments -0.5 = 4.750  
Net Turbine Condition Index

Evaluator: R. ADAMS / S. REISER Technical Review: R. ADAMS  
Management Review: S. REISER Copies to: S. REISER

# Abiquiu Turbine Unit No. 1 Liquid Penetrant and Ultrasonic examination performed



Abiquiu Unit No. 1 Blade No. 1 (5" crack)



Abiquiu Unit No. 5 Blade No. 1 (4.5" crack)

# El Vado Equipment Condition Index

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# Condition Assessment Summary El Vado Transformer Tier 1 and Tier 2

## TRANSFORMER TIER 1 CONDITION ASSESSMENT SUMMARY

Date: October 2012 Location: El Vado GS  
Transformer Identifier: Mo'n Step-up Manufacturer: Westinghouse Yr. Mfd: 1986  
No. of Phases: 3 MVA: 9.2/10.25 Voltage: 69/4.16 kV  
PAV DAF/A

Tier 1 Transformer Condition Summary (For use on indicators on indicator savings. Please refer to condition assessment guide)				
No.	Condition Indicator	Score	Weighting Factor	Total Score
1	Oil Analysis (Score must be 1, 2, or 3)	3	1.143	3.43 <i>Note 1</i>
2	Power Factor and Excitation Current Tests (Score must be 0, 1, 2, or 3)	1	0.952	0.95
3	Operation and Maintenance History (Score must be 0, 1, 2, or 3)	1	0.762	0.76 <i>Note 2</i>
4	AVS (Score must be 1, 2, or 3)	3	0.476	1.43
Tier 1 Transformer Condition Index (Sum of individual Total Scores) (Condition Index should be between 0 and 10)				6.57

Tier 1 Data Quality Indicator (Value must be 0, 1, or 10)
--

Evaluator: R. Adams, D. Levi Technical Review: R. Adams  
Management Review: S. Reiser Copies to: S. Reiser

(Attach supporting documentation.)

*Note 1: TDC & individual combustible gas generation on per month basis per Table 1 is OK, but CO (carbon monoxide) generation is very high. See oil sample results and E2 PSI report.*

*Note 2: H<sub>2</sub> bushing indicator oil loss, power factor & excitation current results poor, high 60*

## TRANSFORMER TIER 2 CONDITION ASSESSMENT SUMMARY

Date: October 2012 Location: El Vado GS  
Transformer Identifier: Mo'n Step-up Manufacturer: Westinghouse Yr. Mfd: 1986  
No. of Phases: 3 MVA: 9.2/10.25 Voltage: 69/4.16 kV  
PAV FA

Tier 2 Transformer Condition Summary		
Tier 2 Test	Adjustment to Tier 1 Condition Index	
T2.1 Turns Ratio Test		0
T2.2 Short Circuit Impedance Test	N/A	
T2.3 Core-to-Ground Resistance (Megger) Test	N/A	
T2.4 Winding DC Resistance Measurement	N/A	
T2.5 Ultrasonic and Sonic Fault Detection Measurements	N/A	
T2.6 Vibration Analysis	N/A	
T2.7 Frequency Response Analysis	N/A	
T2.8 Internal Inspection	N/A	
T2.9 Degree of Polymerization	N/A	
T2.10 Other Specialized Diagnostic Tests	N/A	
Tier 2 Adjustments to Transformer Condition Index (Sum of individual adjustments)		

Tier 2 Data Quality Indicator (Value must be 0, 1, 2, or 10)
---

To calculate the Net Transformer Condition Index (NTCI) should be between 0 and 10; subtract the Tier 2 Adjustments from the Tier 1 Transformer Condition Index:

$$\begin{aligned} \text{Tier 1 Transformer Condition Index} &= 6.57 \\ \text{minus Tier 2 Transformer Adjustments} &= 0 \\ \hline \text{Net Transformer Condition Index} &= 6.57 \end{aligned}$$

13.72

# Maintenance, Testing and Capital Projects

- The DPU has completed a number of major maintenance, testing and capital improvements over the years as either planned reliability improvements or due to equipment failure.
- Consideration of these improvements in assessing the condition of each plant, plant reliability and economic planning of future budgets is critical.
- The table below summarizes the major maintenance and capital improvements that have taken place at the Abiquiu Plant and the El Vado Plant.

# Abiquiu

Abiquiu	
Year	Description
1999	Generator and HV Maintenance and Short Circuit Analysis & Coordination Study
2002	New Batteries
2002	Digital Governor Upgrade
2004	Rebuild Unit #2 TSV Hydraulic Cylinder
2005	Coyote Junction RTU Replacement
2006	Rebuild Unit #1 Wicket Gate Hydraulic Cylinders (Both)
2007	Replace Transmission Line Poles, Conductors & Fiber Optic
2009	Recoat Spiral Cases / Recoat Cone Valve and Bolt Replacement
2010	SCADA MCC Replacement/Upgrade
2010	Rebuild Unit #2 Wicket Gate Hydraulic Cylinders (Both)
2010	Transmission Line Pole Inspection
2011	Energy Dissipating Chamber Concrete Repair
2011	Replacement Transformer Purchased
2011	Installation of 3 <sup>rd</sup> Unit Low-Flow
2012	New Battery Charger
2012	Rebuild Unit #1 Wicket Gate Hydraulic Cylinder (1 of 2)
2013	Condition Assessment
2013	Telemetry Upgrade Plant & River
2013	Clean Sumps
2014	Mechanical Relay Upgrade & Breaker Replacement
2016	Back-up Generator Replacement
2017	Battery System Replacement & Load Test
2018	Controls Upgrade

# El Vado

El Vado	
Year	Description
1999	Generator and HV Maintenance and Short Circuit Analysis & Coordination Study
2002	New Batteries
2005	Spills Substation RTU Replacement
2007	Infra-Red Thermal Scan Baseline Report
2008	Digital Governor Upgrade
2010	SCADA MCC Replacement/Upgrade
2010	Transmission Line Pole Inspection
2014	Mechanical Relay Upgrade
2015	Widen Road @ Cliff and Reinforce Road w/Geogrid
2015	60 Ton Bridge Crane
2015-2017	Generator Rewind and Turbine Refurbishment
2016	Back-up Generator Replacement
2017	Battery System Replacement & Load Test

# 69 kV Transmission Line

# 69 kV Transmission Line

Approximately 12 miles from El Vado plant to the Spills Substation.

- NORA Maintenance Agreement
- Semi-annual line patrol
- Repair or replace damaged insulators, cross-arms anchors, poles and associated hardware and conductors as needed.
- Emergency call-outs for switching and line restoration as needed.
- Deliverables – written report stating the condition of the transmission line following each line patrol

# 10 YEAR CAPITAL PLAN

## ELECTRIC PRODUCTION

FY18 (1 July 2017 - 30 June 2018)	Budget
Abiquiu Controls Upgrade	375,000
3 Ton Jib Crane Abiquiu	140,000
Replace Control System Batteries El Vado & Abiquiu	135,000
Uninterrupted Power Supply Electric SCADA	25,000
	675,000
FY19 (1 July 2018 - 30 June 2019)	Budget
Electric SCADA Server Consolidation	120,000
Electric SCADA Operating System Back-up	50,000
Back-up Power Operation Center HVAC Upgrades	60,000
Abiquiu & El Vado Transformer Oil and Bushings	75,000
	305,000
FY20 (1 July 2019 - 30 June 2020)	Budget
Update Energy & Water Conservation Plan	35,000
Electric SCADA Upgrades (Modems, Switches & RTUS)	100,000
	135,000
FY21 (1 July 2020 - 30 June 2021)	Budget
FY22 (1 July 2021 - 30 June 2022)	Budget
FY23 (1 July 2022 - 30 June 2023)	Budget
FY24 (1 July 2023 - 30 June 2024)	Budget
FY25 (1 July 2024 - 30 June 2025)	Budget
FY26 (1 July 2025 - 30 June 2026)	Budget
FY27 (1 July 2026 - 30 June 2027)	Budget
FY28 (1 July 2027 - 30 June 2028)	Budget

# Questions

# Los Alamos County Battery Energy Storage System Use Review

**March 2018**

DR Borneo  
FM Currie

SAND2018-7393 R

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# **Los Alamos County Battery Energy Storage System Use Review**

DR Borneo  
FM Currie

March 2018

## Summary

The purpose of this study is to identify potential alternative uses for the LAC-owned BESS. One critical fact that must be considered in evaluating any profitable use of the BESS is the standby cost associated with keeping the NaS battery on-line, as it must be kept at 300 degrees Celsius at all times, regardless of whether it is being used or not. Standby for the NaS battery online requires approximately 80 MWh/month, costing approximately \$28,000 annually. Other relevant costs include a \$22,000 annual maintenance contract required for the NaS, and accounting for any losses due to inefficiencies during the operation of the battery. County operations personnel respond to all alarms and visit the BESS on a monthly basis to walk down the site. It estimated this cost approximately \$10,000 per year. The total cost of maintaining and keeping the NaS battery on-line for a year, then, is roughly \$60,000.

The Sandia study team analyzed potential energy storage applications for the batteries and concluded that using the battery storage systems for frequency regulation has the highest potential to result in a net benefit for Los Alamos County, with an estimated net revenue for the County – accounting for maintenance and losses - of \$33,700 if the NaS BESS is used alone, up to \$28,200 for operation of the lead-acid BESS, or up to \$83,900 annually if the NaS and lead-acid BESS are used together. More detail about each of the options studied is contained in the following section.

Finally, a word about the two battery technologies the LAC BESS are based on: It is believed that the sodium-sulfur battery has perhaps ten years of useful life remaining, while the lead-acid-based storage system is more of a wild card. The lead-acid batteries have had problems and it is unclear how much useful life is left in them. Further, industry experience has shown that traditional lead-acid batteries are not particularly well suited to BESS applications such as frequency response because of the rapid charge-discharge cycling they experience. Our recommendation with respect to the lead-acid BESS is to maximize savings while the lead-acid cells hold up. As cells fail they would be removed from service and disposed of until the lead-acid battery is fully “decommissioned.”

## Acknowledgments

This research was supported by the Grid Modernization Initiative of the U.S. Department of Energy as part of its Grid Modernization Laboratory Consortium, a strategic partnership between DOE and the national laboratories to bring together leading experts, technologies, and resources to collaborate on the goal of modernizing the nation's grid.

## Acronyms and Abbreviations

PNM	Public Service Company of New Mexico
T&D	Transmission and Distribution
AGC	Automatic Generation Control
LAC	Los Alamos County
BESS	Battery Energy Storage System

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## Tables

## 1.0 Potential Battery Energy Storage System Applications

Energy storage systems can be used for a wide variety of applications within the electric grid. The applications looked at in this analysis include: the provision of operating reserves, performing arbitrage (time shifting), peak shaving, PV firming, power quality provision, uninterruptible power supply, transmission and distribution (T&D) deferral, and mitigating generation and energy delivery imbalances. The following is a summary of our findings for each application:

### 1.1 Generation Reserve Applications

There are three main reserve categories that the LAC must provide for, either through purchasing from Public Service Company of New Mexico (PNM) according to the PNM Open-Access Transmission Tariff (OATT), purchasing through bilateral contracts, or providing themselves:

- 1) Operating Reserve – Spinning Reserve Service (Schedule 5 service under the PNM OATT)
- 2) Operating Reserve – Supplemental Reserve Service (Schedule 6 service under the PNM OATT), and
- 3) Regulation and Frequency Response Service (Schedule 3 service under the PNM OATT).

*Operating Reserve - Spinning Reserve Service* is needed to serve load immediately in the event of a system contingency. Spinning Reserve Service may be provided by generating units that are on-line and loaded at less than maximum output and by non-generation resources capable of providing this service. The Transmission Customer must either purchase this service from the Transmission Provider or make alternative comparable arrangements to satisfy its Spinning Reserve Service obligation.

*Supplemental Reserve Service* is needed to serve load in the event of a system contingency; however, it is not available immediately to serve load but rather within a short period of time. Supplemental Reserve Service may be provided by generating units that are on-line but unloaded, by quick-start generation or by interruptible load or other non-generation resources capable of providing this service. The Transmission Customer must either purchase this service from the Transmission Provider or make alternative comparable arrangements to satisfy its Supplemental Reserve Service obligation.

*Regulation and Frequency Response Service* is necessary to provide for the continuous balancing of resources (generation and interchange) with load and for maintaining scheduled Interconnection frequency at sixty cycles per second (60 Hz). Regulation and Frequency Response Service is accomplished by committing on-line generation whose output is raised or lowered (predominantly through the use of automatic generating control equipment) and by other non-generation resources capable of providing this service as necessary to follow the moment-by-moment changes in load.

For each of the services just described, LAC's obligation is greater than the capacity of the BESS; therefore the full capacity of the batteries could be applied toward LAC's obligation to PNM and thereby reduce costs. Table 1 lists the costs and potential savings associated with each reserve application.

**Table 1: Reserve Service Costs**

Service	Cost of Service (kW/yr)	Potential Gross NaS Savings (@ 1 MW)	Estimated Savings Using NaS BESS Alone <sup>1</sup>	Potential Gross Pb-acid Savings (@600kW)	Estimated Net Savings Using Pb-a BESS Alone <sup>2</sup>	Potential Gross Combined Savings	Estimated Net Savings Using NaS and Pb-acid BESS <sup>3</sup>
Spinning Reserve (Schedule 5)	*						
Supplemental Reserve (Schedule 6)	*						
Regulation and Frequency Response (schedule 3)	\$103.70	\$103,700	\$33,700	\$62,200	\$28,200	\$165,900	\$83,900

Source: PNM OATT, effective date 4/1/2015, Docket #ER15-1592-000

\*According to conversations with LAC, schedule 5 and 6 services would be difficult to impossible to implement because of existing contract constraints. Should it become possible to renegotiate contract between LAC and PNM, then this may become an option.

The only remaining alternative, then, is to self-supply a portion of the required Regulation and Frequency Response service.

Frequency regulation control signals change rapidly over time, but are typically intended to average out to zero net power over some time interval. In the absence of historical PNM ACG signal data, we estimated the amount of energy that would be required to maintain each BESS at a constant state of charge. This was done by simulating performance of each BESS responding to a frequency signal over one year. We used the PJM 2017 2-second frequency regulation signal as the reference for the estimate. Round-trip efficiency was assumed to be 75% for NaS battery operating in frequency regulation mode. The resultant make-up energy was 487 MWh annually for the NaS BESS, and 292 MWh for the lead-acid BESS. Assuming \$0.041/kWh for replacement energy, supplying this energy at LAC's energy cost rate would cost an estimated \$20,000 annually for the NaS BESS and \$12,000 for the lead-acid BESS. This would need to be subtracted from any benefit realized by offsetting PNM charges for frequency regulation.

<sup>1</sup> NaS savings equals gross savings minus the estimated standby costs of \$28,000, the efficiency loss estimate of \$20,000, and the annual maintenance contract cost of \$22,000 (\$70,000 combined cost).

<sup>2</sup> Lead-acid savings equals gross savings minus the estimated annual efficiency loss estimate of \$12,000 and the annual maintenance contract cost of \$22,000 (\$34,000 combined cost).

<sup>3</sup> Combined savings equals gross savings of both BESS minus the estimated NaS standby costs of \$28,000, combined efficiency losses of \$32,000, and the annual maintenance contract cost of \$22,000 (\$82,000 combined cost).

As Table 1 shows, the estimated **net** savings associated with operating the sodium-sulfur BESS for frequency response is \$33,700. If the lead-acid battery is also used for its remaining life, the estimated savings could go as high as \$83,900 annually. We must reiterate here, however, that we are recommending using the lead-acid BESS while it is still reasonably healthy and removing “bad” cells from service as they fail. The result would be a decreasing benefit over time, but the cost savings from operating the lead-acid BESS is fairly significant and is, in our opinion, worth considering.

The frequency response application would likely require the BESS to take an Automatic Generation Control (AGC) signal from PNM to satisfy schedule 3 tariff requirements. Alternatively (and if PNM allows it), it is sometimes possible to get acceptable frequency response from an BESS using a controller that responds directly to local frequency deviations, which can be even faster than waiting for a specific AGC signal from the area operator control system. Our understanding is that the LAC BESS’s can accept and use an AGC signal, but LAC does not have the in-house expertise to make this happen and the controller is a prototype installed during the NEDO demonstration project. A new control system would need to be purchased to respond to an AGC signal. This capital investment may negate any saving associated with using the BESS for regulation and frequency response service.

The best beginning state of charge would have to be determined by analyzing actual frequency regulation demands over time as well as round trip efficiency losses since each charge-discharge cycle results in a net energy loss. Additionally, round-trip energy losses should also be studied to refine cost savings estimates

Finally, is possible that the BESS could be unable to follow a standard AGC signal in the case of a prolonged charge or discharge demand. Given the high energy-to-power ratio for the LAC BESS’s, this is very unlikely, but needs to be stated as a possibility.

## 1.2 Arbitrage

Arbitrage – also known as time-shifting – is essentially buying energy off peak and storing it for sale during peak demand. In order for time-shifting to be profitable, the difference in on and off-peak power pricing must be great enough to overcome the battery round-trip efficiency losses.

For our analysis we assumed that LAC would purchase power from its own sources at a constant price during off-peak times, and then sell the energy on the open market during peak periods. We assumed a round-trip efficiency of 75% for the BESS and used hourly wholesale price data from PNM for 2015 to calculate potential profit. We found that using the sodium-sulfur battery for arbitrage alone would have saved roughly \$13,000 in 2015.

The lead-acid battery could potentially contribute slightly more, but taking into account the cost of maintaining the sodium-sulfur BESS, our conclusion is that arbitrage will not provide a sufficient source of revenue to justify operating either BESS.

## 1.3 Peak Shaving

LAC pays a Demand Charge of \$24.12/kW of Reserved Capacity per year<sup>4</sup>. This means that using the BESS to eliminate 1 MW of charges would save approximately \$24,000 per year. Taking BESS maintenance costs into consideration, this is not enough revenue potential to justify operating the BESS.

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4 OATT, p. 124

## **1.4 Generator Imbalance Service**

According to LAC the cost of generator imbalance service has been minimal in recent years and does not justify the expense of keeping either BESS on-line.

## **1.5 PV Support**

LAC has stated that any deviations with the installed solar PV capacity can be handled within the 2 MW bandwidth purchased from PNM for regulation and frequency response service as well as handling changes in demand.

## **1.6 Power Quality**

LAC has stated that existing static var compensators on its system adequately handle power quality issues. Therefore, there is no need to use the storage batteries for this application.

## **1.7 UPS**

LAC has stated that there is no current need for this application on the distribution network.

## **1.8 T&D Deferral**

LAC has stated that there are no current or projected T&D projects that the BESS would benefit.

## **1.9 Potential to Combine Services**

If we assume that we could combine the Arbitrage and Peak Shaving applications (which is possible, as both will require the battery to output at times of peak usage), then the BESS could potentially achieve \$37,000 in annual savings/revenues (\$24,000 for Peak shaving + \$13,000 for Arbitrage = \$37,000 total). This amount does not justify the cost of operating the BESS.

We do not believe it is possible to combine the other applications. The Spinning Reserve, Supplemental Reserve, and Regulation and Frequency Response are all mutually exclusive services – it isn't possible to provide more than one of them at the same time with the same resource.

## 2.0 Conclusion & Further Consideration

Our conclusion is that the best application for the LAC BESS is frequency response if the replacement control system is not too costly or if the control system cost can be shared with other utility functions. Using the sodium-sulfur BESS for this application has the potential to reduce Schedule 3 – Regulation and Frequency Response Service – for a net-positive benefit. Adding in the lead-acid BESS could increase this benefit even more while the lead-acid battery functions. Refining this estimate will require two things:

1. Simulating the BESS response to a PNM AGC signal to estimate operational losses in this mode.
2. Determining a “decommissioning” plan for the lead-acid batteries to maximize BESS benefits.

Our initial recommendation for the lead-acid battery is to operate functional cells and permanently remove cells from service as they fail. It may be determined that the lead-acid BESS does not have enough capacity or reliability to attempt to put it back into service.

Other considerations include:

3. Work with Sandia on performance monitoring both for general real-world application data; and specifically gather and analyze information for quantifying the economic justification of continued operation.
4. It might be worthwhile to explore whether a hospital would be interested in purchasing and maintaining the sodium-sulfur battery, or whether LANL might have an application that requires a UPS.
5. If LAC decides not to employ the BESS, it might be worthwhile to explore donating the electronics for the storage systems to an educational institution such as Santa Fe Community College. SFCC has programs in PV and in micro-grids that might benefit from such equipment.
6. Disposal costs need to be considered and it may be more economical to sell the BESS now and avoid disposal costs as part of the sale. Consider issuing a request for bids for a third party to purchase the BESS to see if there is a market.



<http://gridmodernization.labworks.org/>



# County of Los Alamos

## Staff Report

July 18, 2018

Los Alamos, NM 87544  
www.losalamosnm.us

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**Agenda No.:** 4.G.2  
**Index (Council Goals):** BCC - N/A  
**Presenters:** Jeff Johnson, Chair of the Board of Public Utilities  
**Legislative File:** 10695-18

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### **Title**

Review of Policy and Procedure Manual to Formally Add Approved Board of Public Utility (PPM)

### **Recommended Action**

N/A

### **Staff Recommendation**

N/A

### **Body**

The Board of Public Utilities shall review for approval or recommendation of change the PPM for the August 2018 meeting.

### **Alternatives**

N/A

### **Fiscal and Staff Impact**

None

### **Attachments**

None



# County of Los Alamos

## Staff Report

July 18, 2018

Los Alamos, NM 87544  
www.losalamosnm.us

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**Agenda No.:** 4.G.3  
**Index (Council Goals):** BCC - N/A  
**Presenters:** Jeff Johnson, Chair of the Board of Public Utilities  
**Legislative File:** 10697-18

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### Title

Planning for Upcoming Board of Public Utilities Annual Boards & Commissions Presentation to Council on September 25th, 2018

### Recommended Action

None

### Staff Recommendation

None

### Body

On September 25th, 2018 the Board of Public Utilities is scheduled to give its annual Boards & Commissions presentation to Council. This meeting will be a joint meeting with Council and the BPU. The agenda will be a presentation of 2018 DPU / BPU initiatives and actions.

During the 2015 Board Self-evaluation, the Board agreed that the entire Board should be more involved in the development and annual presentation to Council, and a rehearsal presentation should also be done prior to the Chair's presentation. In preparation for the upcoming presentation, the Board should discuss with the Chair possible topics for the presentation.

The following DPU and BPU actions will be discussed with council on 9/25/18:

Completion of the TA-3 Switchgear Substation

Increased development and tracking of performance metrics

Paid down \$2.5M of Los Alamos Waste Water Treatment Facility

Reduced interest on existing LA WWTF loan

Developed financing strategy for White Rock Waste Water Treatment Facility

Negotiated minimal risk 1 year extension of the Carbon Free Power Project and gained LAC

BPU and County Council approval to extend participation for an additional year.

Voted to Exit SJGS in 2022

Repaired LA Reservoir Road and installed Non-Potable Water Line - greatly increasing non-potable system

Started Otowi #2 Well development

Abique Hydro back on-line making power

El Vado upgrade completed, managing completion of a residual water leak from upgrade

Other BPU input?

Attached are the Guidelines for the 2017-2018 B&C Presentations.

### Alternatives

None

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**Fiscal and Staff Impact**

None

**Attachments**

A - Guidelines for 2018-2019 B&C Presentations

## Guidelines for 2018 B&C Presentations County Council Work Sessions

- Each B&C presentation will usually be scheduled on Council's agenda during a work session. The Council work sessions are now "streamed" and are often held in White Rock at Fire Station #3. You can check the County's web site ([www.losalamosnm.us](http://www.losalamosnm.us)) or call the County Manager's Office at 663-1750 to verify the meeting location.
- Please limit your portion of the presentation to approximately 10-15 minutes. Council members will be allocated approximately 15 minutes to ask questions at the end of your presentation.
- See next page for a chart of dates and presentation assignments. Please notify Linda Matteson ([linda.matteson@lacnm.us](mailto:linda.matteson@lacnm.us) or 662-8086) or Libby Carlsten ([libby.carlsten@lacnm.us](mailto:libby.carlsten@lacnm.us) or 662-8261) if you need to re-schedule your presentation date.
- If you prepare a PowerPoint presentation, please provide an electronic copy of your material (5 days prior to the Council meeting) to Linda Matteson ([linda.matteson@lacnm.us](mailto:linda.matteson@lacnm.us)) and Jackie Salazar ([Jacqueline.salazar@lacnm.us](mailto:Jacqueline.salazar@lacnm.us)). Also, your B&C Staff Liaison will need to submit an LAC Information Management work order or contact the IM Service Desk at 662-8090 at least 5 days before the Council meeting to get your presentation loaded on a computer. IM can make arrangements to get a PowerPoint projector transported to the WR Fire Station. (Please note that you're not required to prepare PowerPoint slides. You're encouraged to simply do an oral presentation – it's your choice whether to prepare slides or not.)
- In general, hard copies of presentations are not provided to Council (they use tablets to view agenda items) but if you want, you can bring extra copies for the media and members of the public.
- Your board or commission's FY18 or FY19 Work Plan (depending on your presentation date) will usually be provided to Council as an attachment to the agenda documentation. Feel free to reference it, if you'd like.
- For the 2018 presentations, Council is asking each Board Chair to generally report on the following topics for their board during their presentations:
  - ◇ General overview of your current Work Plan
  - ◇ Top 1-3 Priority Projects/Objectives for your board for the next twelve months
  - ◇ Imposing challenges that your board foresees to achieving the priority items
  - ◇ Ways Council can help
- As noted above, Council will be allowed time to ask questions after your presentation. This will provide an opportunity for Councilors to ask clarifying questions about the issues, activities, and projects of importance to your B&C.

## 2018-2019 Schedule for B&C Presentations to Council

Month	Council Work Session Date	Board or Commission
January 2018	No work session scheduled for January (Reserved for strategic planning)	
February 2018	February 6, 2018	Environmental Sustainability Board, John Bliss, Chair
March 2018	March 13, 2018	
April 2018	No Work Session scheduled for April (budget hearings)	
May 2018	May 15, 2018	Transportation Board, Brian O'Neil, Chair; Planning and Zoning Commission, Terry Priestley, Chair;
June 2018	June 19, 2018	Parks and Recreation Board, Stephanie Nakhleh, Chair Library Board, Jenn Baker, Chair
July 2018	July 24, 2018	Historic Preservation Advisory Board, Mark Rayburn, Chair
August 2018	August 21, 2018	Art in Public Places Board, Jeremy Smith, Chair
September 2018	September 11, 2018	Board of Public Utilities, Jeff Johnson, Chair
October 2018	October 16, 2018	Personnel Board, Leslie Geyer, Chair
November 2018	November 13, 2018	Lodger's Tax Advisory Board, Ryn Herrmann, Chair
December 2018	No work session scheduled for Dec.	
January 2019	January 22, 2019	Tentatively reserved for strategic planning
February 2019	Date TBD	





# County of Los Alamos

## Staff Report

July 18, 2018

Los Alamos, NM 87544  
www.losalamosnm.us

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**Agenda No.:** 4.I.1  
**Index (Council Goals):** BCC - N/A  
**Presenters:** Board of Public Utilities  
**Legislative File:** 11002-18

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### **Title**

Tickler File for the Next 3 Months

### **Attachments**

A - Tickler File for the Next 3 Months



# County of Los Alamos

Los Alamos, NM 87544  
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## Tickler

**Criteria: Agenda Begin Date: 8/1/2018, Agenda End Date: 10/31/2018, Matter Bodies: Board of Public Utilities**

File Number	Title	
<b>Agenda Date: 08/15/2018</b>		
10374-18	<b>Calendar</b> Reminder for Upcoming Boards & Commissions Luncheon <b>Department Name:</b> DPU <b>Drop Dead Date:</b>	<b>04A Chair's Report</b>  <b>Length of Presentation:</b> Apx. 5 Min. <b>Sponsors:</b> Board of Public Utilities
10696-18	<b>Briefing/Report (Dept,BCC) - Action Requested</b> Annual Affirmation of the Board of Public Utilities Policies and Procedures Manual <b>Department Name:</b> DPU <b>Drop Dead Date:</b>	<b>04G General Board Business</b>  <b>Length of Presentation:</b> Apx. 5 Min. <b>Sponsors:</b> Jeff Johnson, Chair of the Board of Public Utilities
10808-18	<b>Briefing/Report (Dept, BCC) - No action requested</b> Planning for Upcoming Board of Public Utilities Annual Boards & Commissions Presentation to Council on September 25th, 2018 <b>Department Name:</b> DPU <b>Drop Dead Date:</b>	<b>04G General Board Business</b>  <b>Length of Presentation:</b> Apx. 20 Min. <b>Sponsors:</b> Jeff Johnson, Chair of the Board of Public Utilities
10955-18	<b>Public Hearings</b> Approval of Incorporated County of Los Alamos Code Ordinance No. ____; Sewer Rate Adjustment <b>Department Name:</b> DPU <b>Drop Dead Date:</b>	<b>05 Public Hearings</b>  <b>Length of Presentation:</b> Apx. 30 Min. <b>Sponsors:</b> Bob Westervelt, Deputy Utilities Manager - Finance/Admin
10443-18	<b>Briefing/Report (Dept,BCC) - Action Requested</b> (TENTATIVE) Approval of Amendment No. 1 & Approval of Task Order No. 2 Under Services Agreement No. AGR17-37 with Stantec Consulting Services, Inc. in the amount of \$[amount], plus Applicable Gross Receipts Tax, for the Purpose of Year 2 Services for the Geographic Information System and Asset Management Upgrade <b>Department Name:</b> DPU <b>Drop Dead Date:</b>	<b>06 Consent</b>  <b>Length of Presentation:</b> N/A <b>Sponsors:</b> Jack Richardson, Deputy Utilities Manager - GWS Services
10915-18	<b>Budget Item</b> Approval of Budget Carryovers from FY2018 to FY2019 <b>Department Name:</b> DPU	<b>06 Consent</b>  <b>Length of Presentation:</b> N/A

File Number	Title
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**Drop Dead Date:**

**Sponsors:** Bob Westervelt, Deputy Utilities Manager - Finance/Admin

**10982-18**

**Briefing/Report (Dept,BCC) - Action Requested**

**06 Consent**

(TENTATIVE) Approval of Task Order No. 3 Under Services Agreement No. AGR17-45 with Alpha Southwest, Inc. in the amount of \$ \_\_\_\_\_, plus Applicable Gross Receipts Tax, for the Purpose of Chlorine Generator Equipment Acquisition and Installation for \_\_\_\_\_.

**Department Name:** DPU

**Length of Presentation:** N/A

**Drop Dead Date:**

**Sponsors:** Jack Richardson, Deputy Utilities Manager - GWS Services

**AGR0576-18**

**General Services Agreement**

**07 Business**

Approval of Services Agreement No. AGR\_\_ - \_\_\_\_ with [vendor] in the amount of \$[amount], plus Applicable Gross Receipts Tax, for the Purpose of Advanced Metering Infrastructure

**Department Name:** DPU

**Length of Presentation:** N/A

**Drop Dead Date:**

**Sponsors:** Bob Westervelt, Deputy Utilities Manager - Finance/Admin

**OR0816-18**

**Ordinance**

**071 Business**

INCORPORATED COUNTY OF LOS ALAMOS CODE ORDINANCE NO. XXX, AN ORDINANCE AUTHORIZING LOS ALAMOS COUNTY TO ENTER INTO A LOAN AGREEMENT WITH THE NEW MEXICO ENVIRONMENT DEPARTMENT ("NMED") FOR THE PURPOSE OF OBTAINING PROJECT LOAN FUNDS IN THE PRINCIPAL AMOUNT NOT TO EXCEED \$17,000,000.00 PLUS ACCRUED INTEREST AT 2.375%; DESIGNATING THE USE OF THE FUNDS FOR THE PURPOSE DEFINED IN THE MOST CURRENT PROJECT DESCRIPTION FORM AS APPROVED BY NMED; DECLARING THE NECESSITY FOR THE LOAN; PROVIDING THAT THE LOAN WILL BE PAYABLE AND COLLECTIBLE SOLELY FROM THE BORROWER'S PLEDGED REVENUES DEFINED BELOW; PRESCRIBING OTHER DETAILS CONCERNING THE LOAN AND THE SECURITY FOR THAT PURPOSE.

**Department Name:** DPU

**Length of Presentation:** Apx. 20 Min.

**Drop Dead Date:**

**Sponsors:** Bob Westervelt, Deputy Utilities Manager - Finance/Admin

**Agenda Date: 09/19/2018**

**10916-18**

**Briefing/Report (Dept,BCC) - Action Requested**

**04G General Board Business**

Approval of Department of Public Utilities Mission, Vision and Values, Goals and Objectives

**Department Name:** DPU

**Length of Presentation:** Apx. 20 Min.

**Drop Dead Date:**

**Sponsors:** Tim Glasco, Utilities Manager

**10947-18**

**Briefing/Report (Dept, BCC) - No action requested**

**073 Business**

Update on Using Low Flow Hydro on Some of the In-town Systems

**Department Name:** DPU

**Length of Presentation:** Apx. 20 Min.

**Drop Dead Date:**

**Sponsors:** Steve Cummins, Deputy Utilities Manager - Power Supply

**Agenda Date: 10/17/2018**

<b>File Number</b>	<b>Title</b>	
<b>10375-18</b>	<b>Calendar</b>	<b>04A Chair's Report</b>
	Reminder for Upcoming Boards & Commissions Luncheon	
	<b>Department Name:</b> DPU	<b>Length of Presentation:</b> Apx. 5 Min.
	<b>Drop Dead Date:</b>	<b>Sponsors:</b> Board of Public Utilities
<b>10418-18</b>	<b>Briefing/Report (Dept, BCC) - No action requested</b>	<b>04G General Board Business</b>
	Quarterly Update on Utility System - (System TBD)	
	<b>Department Name:</b> DPU	<b>Length of Presentation:</b> Apx. 20 Min.
	<b>Drop Dead Date:</b>	<b>Sponsors:</b> Tim Glasco, Utilities Manager



# County of Los Alamos

## Staff Report

July 18, 2018

Los Alamos, NM 87544  
www.losalamosnm.us

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**Agenda No.:** 6.A  
**Index (Council Goals):** BCC - N/A  
**Presenters:** Board of Public Utilities  
**Legislative File:** 11000-18

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### **Title**

Approval of Board of Public Utilities Meeting Minutes

### **Recommended Action**

**I move that the Board of Public Utilities approve the meeting minutes of June 20th, 2018 as presented.**

### **Body**

#### **REQUESTED REVISIONS TO THE DRAFT MINUTES**

Draft minutes are sent to members after each meeting for their review. Members may then send changes to be incorporated prior to final approval of the minutes at the next regular meeting. There were no changes.

### **Attachments**

A - Draft BPU Regular Session Minutes - June 20th, 2018



LOS ALAMOS

# County of Los Alamos

## Minutes

### Board of Public Utilities

1000 Central Avenue  
Los Alamos, NM 87544

*Jeff Johnson, Chair; Carrie Walker, Vice-chair; Paul Frederickson, Stephen McLin and  
Kathleen Taylor, Members  
Tim Glasco, Ex Officio Member  
Harry Burgess, Ex Officio Member  
Christine Chandler, Council Liaison*

Wednesday, June 20, 2018

5:30 PM

1000 Central Avenue  
Council Chambers

#### REGULAR SESSION

### 1. CALL TO ORDER

The regular meeting of the Incorporated County of Los Alamos Board of Public Utilities was held on Wednesday, June 20th, 2018 at 5:30 p.m. at 1000 Central Ave., Council Chambers. Board Chair, Jeff Johnson, called the meeting to order at 5:31 p.m.

**Present 6 - Board Member Johnson, Vice-chair Walker, Board Member Frederickson, Board Member McLin, Board Member Taylor and Board Member Glasco**

**Absent 1 - Board Member Burgess**

County Manager Mr. Harry Burgess was absent. Deputy County Manager Mr. Steve Lynne attended in his place.

### 2. PUBLIC COMMENT

Mr. Johnson opened the floor for public comment on items on the Consent Agenda and for those not otherwise included on the agenda. Members of the public gave the following summarized comments:

1) Ms. Collette Hunter, 3690 Ridgeway Drive - Ms. Hunter has rooftop solar installed at her home. She noted that the Board discussed possible plans to change how customers who produce more power than they use are charged. She likes the way customers are charged now and does not want that changed. She would like to know when the Board plans to discuss this again.

### 3. APPROVAL OF AGENDA

\*\*\*\*\*

**Ms. Taylor moved that the agenda be approved as presented. The motion passed by the following vote:**

\*\*\*\*\*

**Yes: 5 - Board Member Johnson, Vice-chair Walker, Board Member Frederickson, Board Member McLin and Board Member Taylor**

### 4. BOARD BUSINESS

**4.A. Chair's Report**

Mr. Johnson reported on the following items:

1) Mr. Johnson congratulated Mr. McLin on his reappointment to the Board.

2) Mr. Johnson asked Mr. Glasco to discuss during his Utilities Manager's report when the Board might see the rate discussion on distributed solar and when the Board might have a follow-up discussion on the possibility of low flow hydro on some of the in-town service systems.

**4.B. Board Member Reports**

Board members had nothing to report.

**4.C. Utilities Manager's Report**

**4.C.1 [10911-18](#) Utilities Manager's Report**

**Presenters:** Tim Glasco

Mr. Glasco provided a written report, which is included in the minutes as an attachment. He also discussed the additional two items requested by the Chair during his report.

**4.D. County Manager's Report**

Mr. Burgess was absent. Mr. Lynne reported on the following items:

1) Regarding the Munis Enterprise Resource System going live on July 1st, Mr. Lynne informed the Board that throughout the project, the Utilities interface with the public has been identified as one of the most significant parts of the project. During the first two weeks of go-live, the Change Management Team has planned to have additional staff available in the lobby to help direct traffic and provide support to the Customer Care Center.

**4.E. Council Liaison's Report**

The Council Liaison arrived at 6:27 p.m. No report was given.

**4.F. Environmental Sustainability Board Liaison's Report**

Ms. Susan Barns provided a written report, which is included in the minutes as an attachment.

**4.G. General Board Business**

**4.G.1 [10692-18](#) Quarterly Conservation Program Update**

**Presenters:** James Alarid

Mr. Alarid was absent. Utilities Manager Mr. Timothy Glasco presented this item. The following is the substance of the item being considered.

Upon approval of the Energy and Water Conservation Plan in March 2015, the Board requested that staff provide quarterly updates on the Conservation Program and on progress towards the goals and actions identified in the plan. Mr. Glasco presented a

summary of spring and summer conservation activities.

The Board discussed this item and requested clarification where necessary.

#### **4.H. Approval of Board Expenses**

During his Utilities Manager's report, Mr. Glasco discussed the following two possible Board member travel opportunities coming up in July and August: the NuScale facilities tour in Corvallis, OR on July 12-13 and the Utah Associated Municipal Power Systems annual member conference in Logan, UT on August 12th.

\*\*\*\*\*

**Ms. Walker moved that the Board approve expenses for both trips in July and August for up to two people per trip. The motion passed by the following vote:**

\*\*\*\*\*

**Yes: 5 - Board Member Johnson, Vice-chair Walker, Board Member Frederickson, Board Member McLin and Board Member Taylor**

#### **4.I. Preview of Upcoming Agenda Items**

##### **4.I.1 [10914-18](#) Tickler File for the Next 3 Months**

**Presenters:** Board of Public Utilities

In addition to the items already listed in the tickler provided in the agenda packet, the following items were identified for the tickler for upcoming meetings:

1) 07/18/2018 - Update on Using Low Flow Hydro on Some of the In-town Systems (Steve Cummins)

Staff will let the students involved in the Quadrumaniacs First Lego League team know when that discussion is scheduled.

#### **5. PUBLIC HEARING(S)**

##### **5.A [10822-18](#) Public Hearing for Modification of Department of Public Utilities Rules & Regulations - Modifications to Rule GR-15: Deposits; and Deletion of Rule GR-16: Credit Rating**

**Presenters:** Bob Westervelt

Deputy Utility Manager of Finance and Administration Mr. Bob Westervelt presented this item. The following is the substance of the item being considered.

Historically, a credit rating was calculated by the billing system according to defined parameters and was used as one criteria in the determination of whether a deposit would be required on a new or existing utilities account. Tyler Munis, the new Enterprise Resource Planning (ERP) system being implemented by the County, does not support automated calculation of a credit rating. The criteria used can be evaluated and applied by staff without the necessity of establishing a formal credit score. The recommended revision to rule GR-15 deletes reference to the credit rating, but adds some of the criteria previously delineated in Rule GR-16. Some minor language cleanup was included as well. Rule GR-16 defined the credit score criteria and calculation but is no longer applicable in the new ERP, so is recommended for deletion in its entirety. The Board discussed this topic at the May meeting and requested some changes. Those changes were made and

presented for Board consideration.

The Board discussed this item and requested clarification where necessary.

\*\*\*\*\*

**Ms. Walker moved that the Board of Public Utilities approve revisions to Department of Public Utilities Rules & Regulations, Rule GR-15: Deposits, as presented; and approve deletion in its entirety of Department of Public Utilities Rules and Regulations, Rule GR-16: Credit Rating. The motion passed by the following vote:**

\*\*\*\*\*

**Yes: 5 - Board Member Johnson, Vice-chair Walker, Board Member Frederickson, Board Member McLin and Board Member Taylor**

**5.B      [10821-18](#)**

**Public Hearing for Modification of Department of Public Utilities Rules & Regulations - Fee Schedule & Preface**

**Presenters:**      James Alarid

Deputy Utility Manager of Finance & Administration Mr. Bob Westervelt presented this item. The following is the substance of the item being considered.

Clarifying language was added to the Water Hydrant Meter deposit. The name will be changed to Fire Hydrant Meter and language will be added to reinforce the deposit is refundable. Minor editing cleanups were also recommended for the Preface.

The Board discussed this item and requested clarification where necessary.

\*\*\*\*\*

**Ms. Taylor moved that the Board of Public Utilities approve the modifications to the Department of Public Utilities Rules and Regulations - Fee Schedule. I further move that the Board approve the revised Preface as presented. The motion passed by the following vote:**

\*\*\*\*\*

**Yes: 5 - Board Member Johnson, Vice-chair Walker, Board Member Frederickson, Board Member McLin and Board Member Taylor**

**6.      CONSENT AGENDA**

\*\*\*\*\*

**Mr. McLin moved that the Board of Public Utilities approve the items on the Consent Agenda as presented and that the motions contained in the staff reports be included in the minutes for the record. The motion passed by the following vote:**

\*\*\*\*\*

**Yes: 5 - Board Member Johnson, Vice-chair Walker, Board Member Frederickson, Board Member McLin and Board Member Taylor**

**6.A      [10913-18](#)**

**Approval of Board of Public Utilities Meeting Minutes**

**Presenters:**      Department of Public Utilities

**I move that the Board of Public Utilities approve the meeting minutes of May 16th, 2018 as presented.**

- 6.B     [10905-18](#)     Approval of Department of Energy (DOE) - Los Alamos County (LAC)  
Resource Pool Budget for Fiscal Years 2019/2020

**Presenters:**     Bob Westervelt

I move that the Board of Public Utilities approve the 2019-2020 Resource Pool budget as presented and forward to the County Council for its approval.

## **7.     BUSINESS**

- 7.A     [10758-18](#)     Discussion of Proposed Revisions to Water Rule W-6 "Back Flow Prevention and Cross Connection Control" of the DPU Rules and Regulations and Proposed Implementation of New Fees and Enforcement Action Plans to Modernize the Back Flow Prevention - Cross Connection Control (BFP-CCC) Program in Water Distribution.

**Presenters:**     Jack Richardson

Deputy Utility Manager of Gas, Water and Sewer Mr. Jack Richardson presented this item. The following is the substance of the item being considered.

Having an adequate Back Flow Prevention - Cross Connection Control (BFP-CCC) Program is required and essential to every public water supply system, yet many public systems struggle to consistently provide this protection on an annual basis. The Los Alamos County Department of Public Utilities Water Distribution system is no exception. The DPU's responsibilities under its current BFP-CCC Program have historically been met using in-house staff being reactive to notifications from various sources about known deficiencies. The proposed revisions to the existing Rules and Regulations - Water Rule W-6 is an attempt to modernize the existing program by being more consistent with current best industry practices. Utilities has contracted with Viking II, Inc. to help with program development and maintenance. Mr. Richardson introduced the consultants from Viking II, Inc., Mr. Carl Star, Ms. Nancy Star and Mr. Bart Star. The consultants presented general information about the purpose of backflow prevention and answered questions for the Board. Mr. Richardson presented the proposed changes and requested that the Board provide feedback and give some general consensus on a path forward.

The Board discussed this item and requested clarification where necessary.

The following actions were identified for follow-up:

- 1) Staff will revise the proposal based on Board member feedback and will return for further discussion at a later date.

- 7.B     [OR0815-18](#)     Approval of Incorporated County of Los Alamos Code Ordinance No. 683, An Ordinance to Authorize the Refinance and Reissuance of Amended Loan and Promissory Note Agreements with the New Mexico Environment Department to Reflect a Reduction of the Prior Loan Principal Balance, Lowered Interest Rate and Extension of the Payment Term

**Presenters:**     Bob Westervelt

Deputy Utility Manager of Finance & Administration Mr. Bob Westervelt presented this item. The following is the substance of the item being considered.

In January/February 2018 the BPU and Council enacted an ordinance and resolution

authorizing transfer of excess cash reserves from the gas fund to the wastewater fund. \$2.5 million was transferred, and in February, those funds were used to pay down the balance of the outstanding loan that was used for construction of the Los Alamos Wastewater Treatment Plant. By refinancing the remaining balance, the loan can be returned to its original term or extended for a slightly longer term. Doing so would reduce the annual debt service requirements, improve cash flow and establish some flexibility for future capital planning or rate actions. In addition, in 2017 NMED adopted new, lower rates for loans of this type providing an opportunity to refinance the existing debt to a revised combined rate of 2 3/8%. Over the past several months the Board has considered several refinance options and elected to pursue a twenty-five-year repayment schedule for the loan. This proposed ordinance authorizes and effects that refinancing option. If approved by the Board, it will be forwarded to Council for approval.

The Board discussed this item and requested clarification where necessary.

\*\*\*\*\*

**Ms. Walker moved that the Board of Public Utilities approve Incorporated County of Los Alamos Code Ordinance No. 683, An Ordinance to Authorize the Refinance and Reissuance of Amended Loan and Promissory Note Agreements with the New Mexico Environment Department to Reflect a Reduction of the Prior Loan Principal Balance, Lowered Interest Rate and Extension of the Payment Term, as presented and forward to Council for adoption. The motion passed by the following vote:**

\*\*\*\*\*

**Yes: 5 - Board Member Johnson, Vice-chair Walker, Board Member Frederickson, Board Member McLin and Board Member Taylor**

## **8. STATUS REPORTS**

### **8.A 10912-18 Status Reports**

**Presenters:** Department of Public Utilities

The following informational status reports were provided to the Board in the agenda packet:

- 1) Electric Reliability Update
- 2) Accounts Receivables Report
- 3) Safety Report

## **9. PUBLIC COMMENT**

Mr. Johnson opened the floor for public comment on any items. There were no comments.

## **10. ADJOURNMENT**

The meeting adjourned at 7:55 p.m.

\*\*\*\*\*

APPROVAL

\_\_\_\_\_  
Board of Public Utilities Chair Name

\_\_\_\_\_  
Board of Public Utilities Chair Signature

\_\_\_\_\_  
Date Approved by the Board

ATTACHMENT  
OFFICER REPORTS  
SUBMITTED AT THE MEETING

## **MANAGER'S REPORT**

**June 20, 2018**

1. Progress on neutral reactors for the TA-3 Substation. It appears we have a path forward to have the reactors installed prior to energizing the substation.
2. Error in water quality report on mrem vs. pCi/l. The numerical value for the gross beta/photon emitters should be in pCi/L but the automatic report writer we received from NMED defaults to units of the MCL which are in mrem/yr. We will be issuing a correction to our customers explaining and correcting the error.
3. UAMPS offering another tour of the NuScale facilities in Corvallis OR on July 12-13. UAMPS will also be having their annual member conference in Logan, UT on August 12-15, 2018. BPU members are invited to attend.
4. Water line in Los Alamos Canyon is being flushed prior to placing in service. Some water is being discharged down the canyon in the vicinity of the ice rink.
5. Sent letter to PNM indicating the County's election to not continue with the SJGS post-2022. So far, TEP and LAC have indicated intent to withdraw. Farmington has indicated a desire to extend while PNM and UAMPS have not yet made their intentions known.
6. We are intervening in a rate case for NM Gas Co. They are proposing an approximate 17% increase in transportation cost to us. Settlement meetings are on-going and expected to be complete one way or another by late September.
7. Go-live for the Tyler Munis ERP system is scheduled for July 1, 2018. We are still working with Paymentus for credit card payments, and with SEW for integration of the mobile app. It appears we will be ready for go live with these features.
8. CCC personnel will be moved to the Boards and Commissions room 110 on July 2-13 because of construction work in the lobby of the Muni Bldg.

**Environmental Sustainability Board (ESB) liaison report**

*Susan Barns, ESB Liaison      6/20/2018*

Recent activities of the ESB include:

- Review and discussion of Environmental Services FY19 third quarter financial report
- Los Alamos Recycler of the Year Awards were given to Chamisa Elementary School and Cortex and Company Salon. We had several very qualified businesses and non-profits nominated, and we applaud all their efforts in promoting sustainability in Los Alamos!
- Education and outreach booths at Chamberfest, a Summer Movie in the Park, and the Farmer's Market. We look forward to interacting with the community at ScienceFest, the Rodeo Festival, BearFest and another Farmer's Market.
- Environmental Services has received a grant from NMED to install water bottle filling stations in public schools

Tomorrow night's meeting will include:

- A presentation on Recycle Coach, a web- and mobile-based education application to help residents recycle more and better
- An update from the Zero Waste subcommittee, including an Ignite talk on Zero Waste recently given at the Los Alamos Makers.
- A presentation on Repurposing Discarded Items by Mark Devolder

Just a reminder: Yard Trimming roll cart pick-ups will begin July 1.



# County of Los Alamos

## Staff Report

July 18, 2018

Los Alamos, NM 87544  
www.losalamosnm.us

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**Agenda No.:** 7.A  
**Index (Council Goals):** BCC - N/A  
**Presenters:** Bob Westervelt, Deputy Utilities Manager - Finance/Admin  
**Legislative File:** 10954-18

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### Title

Preliminary Discussion About Sewer Rate Changes

### Recommended Action

**None - discussion item only**

### Staff Recommendation

None - discussion item only

### Body

This is the preliminary discussion of a proposed 8% increase to residential and commercial sewer rates. A formal public hearing on this item is scheduled for the August Board meeting, at which time the Board will act on the final proposed ordinance.

The ten-year forecast for the sewer utility presented with the FY2018 budget included a series of incremental rate increases to generate revenues needed for current operations and to build cash reserves necessary for future infrastructure replacements, most notably the needed replacement for the White Rock waste water treatment facility. Several alternatives have been considered as to timing of that plant replacement and financing alternatives. While the long-term projection of rate increases in each scenario that was considered were somewhat different, all include a series of rate increases in the coming years. The scenario adopted by the Board included an 8% increase in FY18 and another in FY19, with declining increases in years following. The FY19/20 budget represents implementation of that scenario, updated to reflect current known conditions and financing decisions that have been or are planned for implementation. \$2.5 million has been transferred from the Gas fund to the Sewer fund and used to pay down the 2012 NMED Loan that was used to finance the design and construction of the Los Alamos Wastewater Treatment Facility. We are currently working on refinancing that loan at a lower rate, and extending the term somewhat to improve cash flow for the utility. The Board has also adopted a financing strategy for the new White Rock plant that strikes a reasonable balance between life of plant, term of loan, and cash flow requirements of the utility. While these actions work together toward allowing some flexibility in terms of future rate increases, staff considers it prudent to move forward with the 8% that was budgeted for FY19 and consider adjusting future rate increases accordingly, if feasible given financial conditions when those rate actions are considered. This ordinance implements that budgeted rate adjustment.

Attached for reference is the ten-year projection included with the FY19 budget package (Attachment A1), and an updated projection showing the results of the refinancing that is

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underway and the project plan for the White Rock Treatment Facility (Attachment A2). Also attached is the chart of the longer term financial plan adopted by the Board of Public Utilities in FY18, known as “Plan 20” (Attachment B1), and an update to that plan with those same changes (attachment B2). As shown in the chart of that updated long range forecast (Attachment B3), we are projecting that by moving forward with this budgeted rate adjustment and the planned financing package, we are able to significantly curtail future rate increases, plus achieve our targeted cash balance by FY2023, instead of the FY2034 or FY2035 date previously projected

The monthly sewer bill for residential customers for fiscal years 2017 through 2027 as originally projected in “Plan 20” is provided (Attachment C1), as well as revised projections resulting from this updated financial plan (Attachment C2). As shown, in either case the projected sewer costs remain well below 1% of Los Alamos Median household income, but the trajectory is significantly improved with this revised financial plan. Recent changes in the industry call for including system condition assessment and locality specific economic conditions in assessing affordability, so it is hard to just reference a specific value for comparison, but all assessments staff has been able to generate or reference indicate that sewer costs of less than 1% of median household income would be considered very affordable.

In response to prior discussion, also provided is a comparison of projected annual sewer charges against the much more modest statewide median household income. One should consider our typography and system requirements, the age of our system and known and planned system upgrade and replacement needs in considering if comparing against even this lower economic threshold should be considered affordable.

Finally, Attachment D shows a comparison of Los Alamos’ projected residential sewer bill at various consumption quantities with those of nearby communities. Note, the comparison targets communities of similar size or topography. We did not chart Taos ski valley as it is such an outlier that it would have distorted the scale of the rest of the comparison, but the remaining communities in the table are shown graphically and indicate that with the increase we are still comparable to the most similar cities for which we could obtain data.

#### **Alternatives**

As noted above, in all the scenarios that have been considered a series of rate increases are going to be needed to fund necessary operations and replacement of facilities. Because of the actions already taken or underway to strengthen the fund, a lower increase of 4 or 6 percent could be considered. That alternative is not without risk, as the fund, while improved, is still several years away from achieving targeted cash reserves, and with major facilities replacement in the immediate planning horizon it is most prudent to have adequate reserves. This proposal is to proceed with the 8% increase that was budgeted for FY19 to further strengthen the financial position of the utility in anticipation of those major capital expenditures.

#### **Fiscal and Staff Impact**

The budgeted 8% increase is expected to generate \$312,836 additional revenue annually.

#### **Attachments**

A - Ten-year budget projections

1. Original from FY19/20 Budget Book
2. Revised

B - Long Term twenty-five-year financial projections

- 
1. Original "Plan 20" - Chart
  2. Revised - Table
  3. Revised - Chart

C - Ten Year projected monthly sewer bill for residential customers

1. As originally projected in "Plan 20"
2. Revised

D - Residential sewer rates - Comparison with similar neighboring communities

E - Proposed Ordinance

Los Alamos County Utilities Department  
10-Year Financial Forecast - FY2019-FY2028 - from budget book  
Wastewater Division

1.50%

EXPENSE FORECAST										
WASTEWATER COLLECTION										
BUDGET 2019	BUDGET 2020	FORECAST 2021	FORECAST 2022	FORECAST 2023	FORECAST 2024	FORECAST 2025	FORECAST 2026	FORECAST 2027	FORECAST 2028	
282,862	286,764	291,065	295,431	299,863	304,361	308,926	313,560	318,263	323,037	
341,104	349,902	355,151	360,478	365,885	371,373	376,944	382,598	388,337	394,162	
139,160	141,580	143,704	145,860	148,047	150,268	152,522	154,810	157,132	159,489	
4,074	4,195	4,258	4,322	4,386	4,452	4,519	4,587	4,656	4,725	
767,201	782,441	794,178	806,090	818,182	830,454	842,911	855,555	868,388	881,414	
Total WWC Operations Expenses										
WASTEWATER TREATMENT										
LA WWTP Operations & Maintenance										
1,866,805	1,721,473	1,747,295	1,773,505	1,800,107	1,827,109	1,854,515	1,882,333	1,910,568	1,939,227	
1,866,805	1,721,473	1,747,295	1,773,505	1,800,107	1,827,109	1,854,515	1,882,333	1,910,568	1,939,227	
602,162	602,162	611,195	620,363	629,668	639,113	648,700	658,430	668,307	678,331	
812,352	766,103	777,595	789,259	801,098	813,114	825,311	837,690	850,256	863,010	
Operations encumbrances rolled forward										
966,892	966,893	1,625,124	1,625,123	1,625,123	1,625,124	1,531,339	1,437,555	1,437,554	1,434,213	
Debt Service (WWT)										
1,000,000	13,520,000	50,000	844,000	4,528,000	537,000	678,000	988,000	854,000	854,000	
Capital										
5,015,412	4,839,073	5,555,386	5,614,340	5,674,178	5,734,914	5,702,777	5,671,563	5,735,073	5,796,195	
1,000,000	13,520,000	50,000	844,000	4,528,000	537,000	678,000	988,000	854,000	854,000	
6,015,412	18,359,073	5,605,386	6,458,340	10,202,178	6,271,914	6,380,777	6,659,563	6,589,073	6,650,195	
REVENUE FORECAST										
Mgal Processed										
430,000	430,000	430,000	430,000	430,000	430,000	430,000	430,000	430,000	430,000	
6,629	6,629	6,629	6,629	6,629	6,629	6,629	6,629	6,629	6,629	
40.15	42.66	44.79	46.69	48.32	49.53	50.52	51.40	52.17	52.95	
11.09	11.78	12.37	12.90	13.35	13.68	13.95	14.19	14.40	14.62	
8.00%	6.25%	5.00%	4.25%	3.50%	2.50%	2.00%	1.75%	1.50%	1.50%	
4,035,279	4,287,287	4,501,494	4,692,863	4,856,668	4,977,947	5,077,175	5,165,378	5,242,555	5,321,308	
Total Revenue from Res'l SF Flat Rate										

Los Alamos County Utilities Department  
10-Year Financial Forecast - FY2019-FY2028 - from budget book  
Wastewater Division

1.50%

	BUDGET 2019	BUDGET 2020	FORECAST 2021	FORECAST 2022	FORECAST 2023	FORECAST 2024	FORECAST 2025	FORECAST 2026	FORECAST 2027	FORECAST 2028
Res'l Multi-Family Flat Rate Customers	75	75	75	75	75	75	75	75	75	75
Res'l Multi-Family Service Charge	11.09	11.78	12.37	12.90	13.35	13.68	13.95	14.19	14.40	14.62
No. of Res'l Multi-Family Dwelling Units	1,585	1,585	1,585	1,585	1,585	1,585	1,585	1,585	1,585	1,585
Res'l Multi-Family Flat Rate	33.45	35.54	37.32	38.91	40.27	41.28	42.11	42.85	43.49	44.14
<b>Rate Increase Percentage</b>	<b>8.00%</b>	<b>6.25%</b>	<b>5.00%</b>	<b>4.25%</b>	<b>3.50%</b>	<b>2.50%</b>	<b>2.00%</b>	<b>1.75%</b>	<b>1.50%</b>	<b>1.50%</b>
Total Revenue from Res'l MF Flat Rate	607,428	645,378	677,702	706,578	731,273	749,610	764,678	778,111	789,731	801,539
Non-Residential Customers	291	291	291	291	291	291	291	291	291	291
Non-Residential Service Charge	11.09	11.78	12.37	12.90	13.35	13.68	13.95	14.19	14.40	14.62
Non-Residential Sales in Kgal	45,572	45,572	45,481	45,390	45,299	45,209	45,118	45,028	44,938	44,848
Adjustment Factor	8.00%	1.75%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Adjusted Non-Residential Sales in Kgal	49,218	46,370	45,481	45,390	45,299	45,209	45,118	45,028	44,938	44,848
Non-Res'l Commodity Charge per Kgal	18.90	20.08	21.08	21.98	22.75	23.32	23.79	24.21	24.57	24.94
<b>Rate Increase Percentage</b>	<b>8.00%</b>	<b>6.25%</b>	<b>5.00%</b>	<b>4.25%</b>	<b>3.50%</b>	<b>2.50%</b>	<b>2.00%</b>	<b>1.75%</b>	<b>1.50%</b>	<b>1.50%</b>
Total Revenue from Non-Residential	939,874	943,068	971,875	1,011,435	1,044,858	1,068,972	1,088,411	1,105,486	1,119,775	1,134,474
Total Sales Revenue	5,582,581	5,875,734	6,151,070	6,410,875	6,632,799	6,796,529	6,930,264	7,048,975	7,152,061	7,257,320
Interest on Utility Reserves	35,667	25,738	64,298	79,547	80,349	-	6,239	20,132	30,371	45,205
Loan Proceeds	-	14,000,000	-	-	-	-	-	-	-	-
Revenue on Recoverable Work	-	-	-	-	-	-	-	-	-	-
Total Cash Inflow	5,618,248	19,901,472	6,215,368	6,490,422	6,713,148	6,796,529	6,936,503	7,069,107	7,182,432	7,302,525
<b>Net Cash Flow</b>	(397,165)	1,542,399	609,982	32,083	(3,489,029)	524,615	555,726	409,543	593,359	652,330
Cumulative Net Cash Flow	(397,165)	1,145,234	1,755,216	1,787,299	(1,701,731)	(1,177,116)	(621,390)	(211,846)	381,512	1,033,842
Cash Balance	1,029,505	2,571,904	3,181,886	3,213,969	(275,061)	249,554	805,280	1,214,823	1,808,182	2,460,512
Recommended Cash Balance	4,207,621	4,124,781	4,828,126	4,863,092	4,898,583	4,934,608	4,877,387	4,820,715	4,858,384	4,893,277

Los Alamos County Utilities Department  
10-Year Financial Forecast - FY2019-FY2028 - revised  
Wastewater Division

1.50%

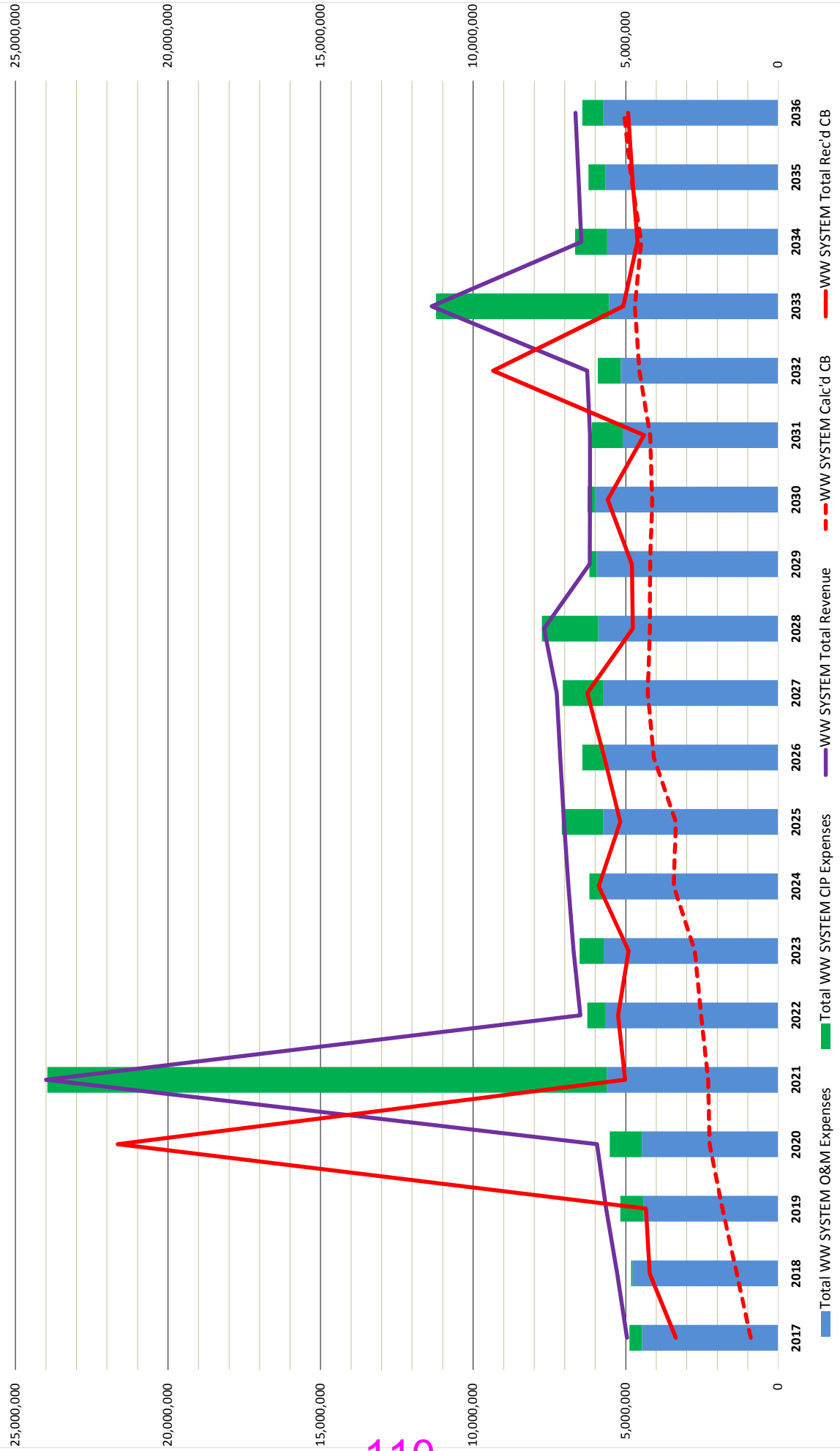
EXPENSE FORECAST												
ACTUAL	REV BUDGET	BUDGET	BUDGET	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST	FORECAST
2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	
<b>WASTEWATER COLLECTION</b>												
	265,879	305,375	282,862	286,764	291,065	295,431	304,361	308,926	313,560	318,263	323,037	
Supervision, Misc Direct Admin												
Wastewater Collection Operations	289,332	417,602	341,104	349,902	355,151	360,478	371,373	376,944	382,598	388,337	394,162	
Sewer Lift Stations	220,637	275,214	139,160	141,580	143,704	145,860	150,268	152,522	154,810	157,132	159,489	
Capital Project Inspection & Support		4,074	4,137		4,199	4,262	4,326	4,457	4,524	4,591	4,660	
Total WWC Operations Expenses	775,849	998,191	767,201	782,383	794,119	806,031	818,121	842,849	855,492	868,324	881,349	
<b>WASTEWATER TREATMENT</b>												
	7,557	965,943	1,235,173	1,138,145	1,155,217	1,172,545	1,207,986	1,226,105	1,244,497	1,263,164	1,282,112	
LA WWTP Operations & Maintenance												
WR WWTP Operations & Maintenance	1,199,080	402,156	631,632	583,328	592,078	600,959	619,123	628,410	637,836	647,404	657,115	
Total WWTP Operations Expenses	1,206,636	1,368,100	1,866,805	1,721,473	1,747,295	1,773,505	1,827,109	1,854,515	1,882,333	1,910,568	1,939,227	
Interdepartmental Charges	411,402	590,289	602,162	602,162	611,195	620,363	639,113	648,700	658,430	668,307	678,331	
Administrative Division Allocation	499,694	835,197	812,352	766,103	777,595	789,259	801,098	813,114	825,311	837,690	850,256	
Operations encumbrances rolled forward		104,204										
Debt Service (WWT)	1,151,394	966,892	966,892	966,893	1,625,124	1,625,123	1,625,124	1,531,339	1,437,555	1,437,554	1,434,213	
Capital	662,162	65,218	1,000,000	16,000,000	50,000	844,000	2,528,000	678,000	988,000	854,000	512,000	
Total Operations Expenses	4,044,975	4,862,873	5,015,412	4,839,015	5,555,327	5,614,280	5,674,117	5,702,714	5,671,500	5,735,009	5,796,129	
Total Capital Expenditures	662,162	65,218	1,000,000	16,000,000	50,000	844,000	2,528,000	678,000	988,000	854,000	512,000	
Total Cash Outflow	4,707,137	4,928,091	6,015,412	20,839,015	5,605,327	6,458,280	8,202,117	6,380,714	6,659,500	6,589,009	6,308,129	
<b>REVENUE FORECAST</b>												
<i>Mgal Processed</i>												
	430,000	430,000	430,000	430,000	430,000	430,000	430,000	430,000	430,000	430,000	430,000	
Res'l Single-Family Flat Rate Customers	6,629	6,629	6,629	6,629	6,629	6,629	6,629	6,629	6,629	6,629	6,629	
Res'l Single-Family Flat Rate	34.43	37.18	40.15	42.56	44.26	45.59	45.59	45.59	45.59	45.59	46.27	
Res'l Single-Family Service Charge	9.51	10.27	11.09	11.76	12.23	12.60	12.60	12.60	12.60	12.60	12.79	
Rate Increase Percentage	8.00%	8.00%	8.00%	6.00%	4.00%	3.00%	0.00%	0.00%	0.00%	0.00%	1.50%	
Total Revenue from Res'l SF Flat Rate	3,736,807	4,035,279	4,277,837	4,448,730	4,582,609	4,582,609	4,582,609	4,582,609	4,582,609	4,582,609	4,651,124	

Los Alamos County Utilities Department  
10-Year Financial Forecast - FY2019-FY2028 - revised  
Wastewater Division

1.50%

	ACTUAL 2017	REV BUDGET 2018	BUDGET 2019	BUDGET 2020	FORECAST 2021	FORECAST 2022	FORECAST 2023	FORECAST 2024	FORECAST 2025	FORECAST 2026	FORECAST 2027	FORECAST 2028
Res'l Multi-Family Flat Rate Customers	75	75	75	75	75	75	75	75	75	75	75	75
Res'l Multi-Family Service Charge	9.51	10.27	11.09	11.76	12.23	12.60	12.60	12.60	12.60	12.60	12.60	12.79
No. of Res'l Multi-Family Dwelling Units	1,585	1,585	1,585	1,585	1,585	1,585	1,585	1,585	1,585	1,585	1,585	1,585
Res'l Multi-Family Flat Rate	28.68	30.97	33.45	35.46	36.88	37.99	37.99	37.99	37.99	37.99	37.99	38.56
<b>Rate Increase Percentage</b>	<b>8.00%</b>	<b>8.00%</b>	<b>8.00%</b>	<b>6.00%</b>	<b>4.00%</b>	<b>3.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>1.50%</b>
Total Revenue from Res'l MF Flat Rate	562,395		607,428	643,931	669,717	689,875	689,875	689,875	689,875	689,875	689,875	700,227
Non-Residential Customers	291	291	291	291	291	291	291	291	291	291	291	291
Non-Residential Service Charge	9.51	10.27	11.09	11.76	12.23	12.60	12.60	12.60	12.60	12.60	12.60	12.79
Non-Residential Sales in Kgal	45,572	47,522	45,572	45,572	45,481	45,390	45,299	45,209	45,118	45,028	44,938	44,848
Adjustment Factor	24.00%	16.00%	8.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Adjusted Non-Residential Sales in Kgal	56,510	55,126	49,218	45,572	45,481	45,390	45,299	45,209	45,118	45,028	44,938	44,848
Non-Res'l Commodity Charge per Kgal	16.20	17.50	18.90	20.03	20.83	21.45	21.45	21.45	21.45	21.45	21.45	21.77
<b>Rate Increase Percentage</b>	<b>8.00%</b>	<b>8.00%</b>	<b>8.00%</b>	<b>6.00%</b>	<b>4.00%</b>	<b>3.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>0.00%</b>	<b>1.50%</b>
Total Revenue from Non-Residential	970,543		939,874	925,257	960,371	987,084	985,195	983,310	981,429	979,551	977,678	990,372
Total Sales Revenue	4,913,866	5,269,745	5,582,581	5,847,025	6,078,818	6,259,568	6,257,680	6,255,795	6,253,913	6,252,036	6,250,162	6,341,723
Interest on Utility Reserves	41,799	13,516	35,691	32,477	90,203	127,466	129,337	127,613	131,444	132,602	126,773	122,514
Loan Proceeds				17,000,000			1,600,000					
Revenue on Recoverable Work	410	-	-	-	-	-	-	-	-	-	-	-
Total Cash Inflow	4,956,075	5,283,261	5,618,271	22,879,502	6,169,021	6,387,034	7,987,017	6,383,407	6,385,357	6,384,638	6,376,935	6,464,237
<b>Net Cash Flow</b>	<b>248,938</b>	<b>355,170</b>	<b>(397,141)</b>	<b>2,040,487</b>	<b>563,694</b>	<b>(71,246)</b>	<b>(215,100)</b>	<b>111,554</b>	<b>4,643</b>	<b>(274,862)</b>	<b>(212,074)</b>	<b>156,107</b>
<b>Cumulative Net Cash Flow</b>	<b>248,938</b>	<b>604,108</b>	<b>(397,141)</b>	<b>1,643,346</b>	<b>2,207,040</b>	<b>2,135,794</b>	<b>1,920,694</b>	<b>2,032,248</b>	<b>2,036,891</b>	<b>1,762,029</b>	<b>1,549,955</b>	<b>1,706,063</b>
add back budgeted debt service payments			966,892	966,893	1,625,124	1,625,123	1,625,123	1,625,124	1,531,339	1,437,555	1,437,554	1,434,213
subtract revised debt service payments			(698,314)	(698,314)	(698,314)	(1,479,013)	(1,479,013)	(1,583,427)	(1,489,642)	(1,395,857)	(1,395,857)	(1,392,516)
<b>revised net cash flow</b>			(128,563)	2,309,065	1,490,503	74,864	(68,990)	153,251	46,340	(233,165)	(170,376)	197,804
<b>revised cumulative net cash flow</b>			(128,563)	2,180,503	3,671,006	3,745,870	3,676,880	3,830,131	3,876,471	3,643,307	3,472,930	3,670,735
difference could fund accelerated project schedule, lower projected future rate increases, earlier achievement of financial targets, or any combination thereof.			268,578	537,157	1,463,966	1,610,076	1,756,186	1,797,883	1,839,581	1,881,278	1,922,975	1,964,672
Cash Balance	1,072,455	1,427,625	1,299,062	3,608,128	5,098,631	5,173,495	5,104,504	5,257,756	5,304,096	5,070,932	4,900,555	5,098,360
Recommended Cash Balance		16,732,781	19,220,536	3,182,306	4,005,316	6,499,460	4,538,347	4,814,095	5,061,101	4,864,568	4,554,288	4,614,143

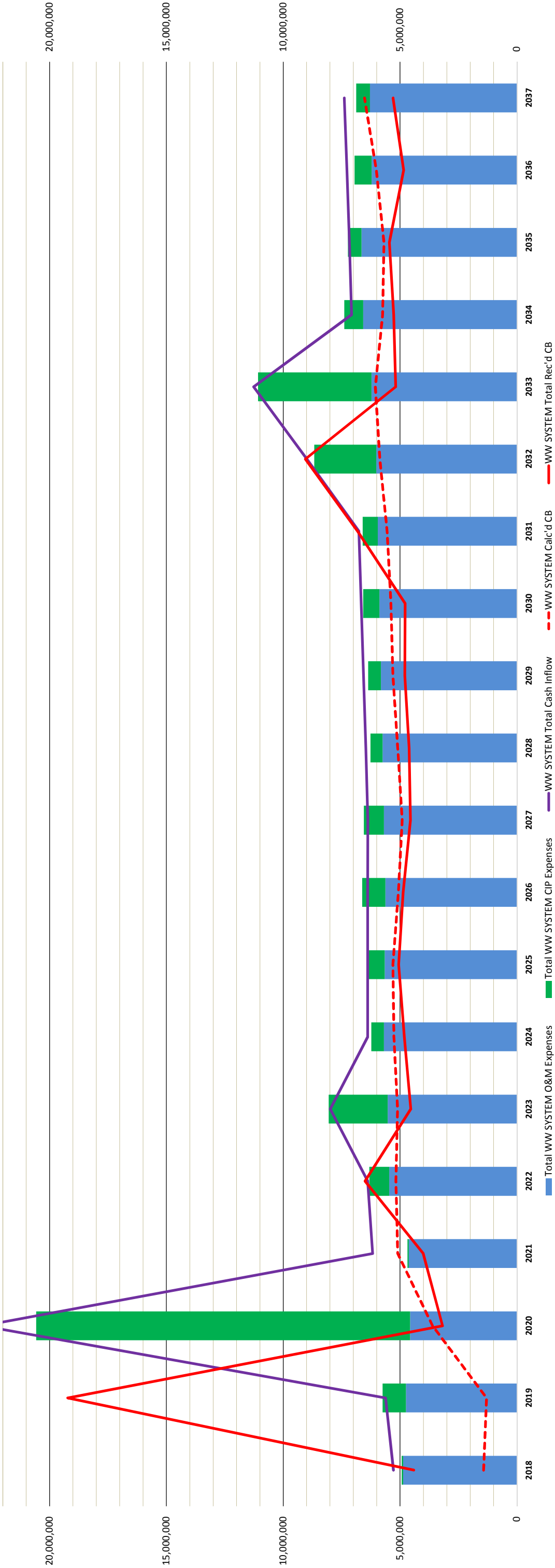
Plan 20 - Current Budget Plan (2022) - WW SYSTEM Total Revenue vs Total Expenses with Cash Balances (Calculated vs Recommended)







LA REF1 25 YR (2035) & \$17.0 Million WR FINAN 30 YR (2051)\_6-27-2018- WW SYSTEM Total Cash Inflow vs Total Expenses with Cash Balances (Calculated vs Recommended)



Projected Average Sewer Bill for Residential Customers - **PLAN 20**

	Monthly Sewer	Rate Increase Percentage	Additional Annual Cost Over Previous Year	Los Alamos Median Household Income *	Assumed Annual Income Increase	Percentage of Income Needed to Pay Sewer Bill	New Mexico Median Household Income **	Assumed Annual Income Increase	Percentage of Income Needed to Pay Sewer Bill
FY2017	\$43.94			\$105,902		<b>0.50%</b>	\$46,748		<b>1.13%</b>
FY2018	\$47.46	8.00%	\$42.18	\$108,550	2.5%	<b>0.52%</b>	\$47,917	2.5%	<b>1.19%</b>
FY2019	\$51.25	8.00%	\$45.56	\$111,263	2.5%	<b>0.55%</b>	\$49,115	2.5%	<b>1.25%</b>
FY2020	\$54.45	6.25%	\$38.44	\$114,045	2.5%	<b>0.57%</b>	\$50,342	2.5%	<b>1.30%</b>
FY2021	\$57.18	5.00%	\$32.67	\$116,896	2.5%	<b>0.59%</b>	\$51,601	2.5%	<b>1.33%</b>
FY2022	\$59.61	4.25%	\$29.16	\$119,818	2.5%	<b>0.60%</b>	\$52,891	2.5%	<b>1.35%</b>
FY2023	\$61.69	3.50%	\$25.04	\$122,814	2.5%	<b>0.60%</b>	\$54,213	2.5%	<b>1.37%</b>
FY2024	\$63.24	2.50%	\$18.51	\$125,884	2.5%	<b>0.60%</b>	\$55,569	2.5%	<b>1.37%</b>
FY2025	\$64.50	2.00%	\$15.18	\$129,031	2.5%	<b>0.60%</b>	\$56,958	2.5%	<b>1.36%</b>
FY2026	\$65.63	1.75%	\$13.55	\$132,257	2.5%	<b>0.60%</b>	\$58,382	2.5%	<b>1.35%</b>
FY2027	\$66.61	1.50%	\$11.81	\$135,564	2.5%	<b>0.59%</b>	\$59,841	2.5%	<b>1.34%</b>

\* 2017 data point from <https://www.census.gov/quickfacts/fact/table/losalamoscountynewmexico/PST045217> - 2012-2016 data, 2016 dollars

\*\* <https://www.deptofnumbers.com/income/new-mexico/> - 2016 data

Projected Average Sewer Bill for Residential Customers - Updated **PLAN 20**

	Monthly Sewer	Rate Increase Percentage	Additional Annual Cost Over Previous Year	Los Alamos Median Household Income *	Assumed Annual Income Increase	Percentage of Income Needed to Pay Sewer Bill
FY2017	\$43.94			\$105,902		<b>0.50%</b>
FY2018	\$47.46	8.00%	\$42.18	\$108,550	2.5%	<b>0.52%</b>
FY2019	\$51.25	8.00%	\$45.56	\$111,263	2.5%	<b>0.55%</b>
FY2020	\$54.33	6.00%	\$36.90	\$114,045	2.5%	<b>0.57%</b>
FY2021	\$56.50	4.00%	\$26.08	\$116,896	2.5%	<b>0.58%</b>
FY2022	\$58.19	3.00%	\$20.34	\$119,818	2.5%	<b>0.58%</b>
FY2023	\$58.19	0.00%	\$0.00	\$122,814	2.5%	<b>0.57%</b>
FY2024	\$58.19	0.00%	\$0.00	\$125,884	2.5%	<b>0.55%</b>
FY2025	\$58.19	0.00%	\$0.00	\$129,031	2.5%	<b>0.54%</b>
FY2026	\$58.19	0.00%	\$0.00	\$132,257	2.5%	<b>0.53%</b>
FY2027	\$58.19	0.00%	\$0.00	\$135,564	2.5%	<b>0.52%</b>

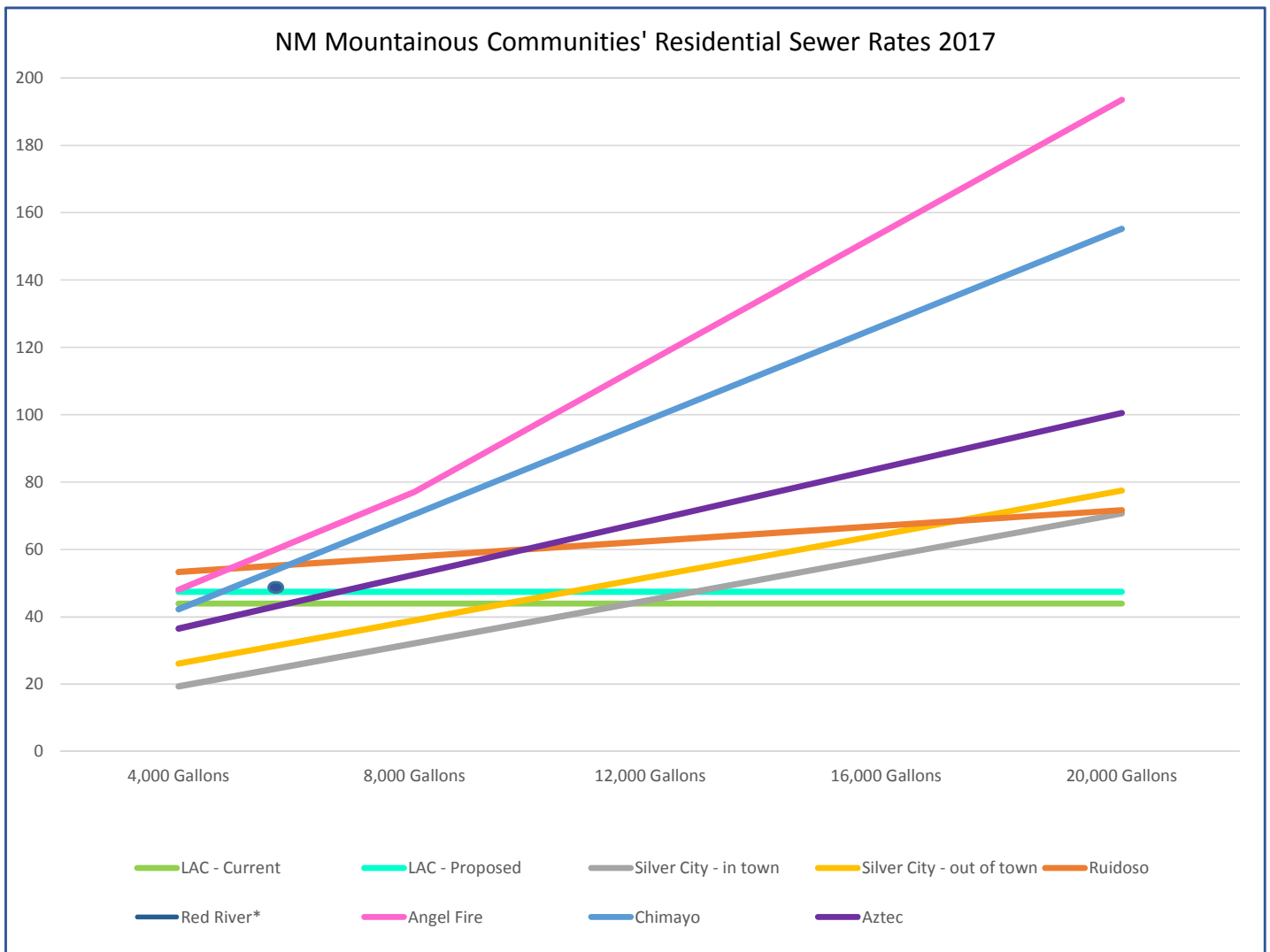
  

New Mexico Median Household Income **	Assumed Annual Income Increase	Percentage of Income Needed to Pay Sewer Bill
\$46,748		<b>1.13%</b>
\$47,917	2.5%	<b>1.19%</b>
\$49,115	2.5%	<b>1.25%</b>
\$50,342	2.5%	<b>1.29%</b>
\$51,601	2.5%	<b>1.31%</b>
\$52,891	2.5%	<b>1.32%</b>
\$54,213	2.5%	<b>1.29%</b>
\$55,569	2.5%	<b>1.26%</b>
\$56,958	2.5%	<b>1.23%</b>
\$58,382	2.5%	<b>1.20%</b>
\$59,841	2.5%	<b>1.17%</b>

\* 2017 data point from <https://www.census.gov/quickfacts/fact/table/losalamoscountynewmexico/PST045217> - 2012-2016 data, 2016 dollars  
 \*\* <https://www.deptofnumbers.com/income/new-mexico/> - 2016 data

This sheet updated with revised long range plan developed using revised loan parameters  
 LA Loan \$2.5M oaydown, balance refinanced @2.375% for 30 year total repayment term  
 W RTP Loan \$17M @2.375% for 25 year term  
 See Jack Richardson analysis 7/2/2018

Los Alamos County Department of Public Utilities  
Proposed Wastewater Rate Increase  
June 2017



**RESIDENTIAL SEWER RATES: LOS ALAMOS VS. COMPARABLE COMMUNITIES**

Monthly Usage	LAC - Current	LAC - Proposed	Silver City - in town	Silver City - out of town	Ruidoso	Taos Ski Valley	Red River*	Angel Fire	Chimayo	Aztec
4,000 Gallons	43.94	47.46	19.34	26.10	53.29	225.04		48.03	42.26	36.50
6,000 Gallons	43.94	47.46	25.76	32.52	55.59	311.04	47.99	48.03	56.38	44.50
8,000 Gallons	43.94	47.46	32.18	38.94	57.89	397.04		77.13	70.50	52.50
12,000 Gallons	43.94	47.46	45.02	51.78	62.49	569.04		115.93	98.74	68.50
14,000 Gallons	43.94	47.46	51.44	58.20	64.79	655.04		135.33	112.86	76.50
16,000 Gallons	43.94	47.46	57.86	64.62	67.09	741.04		154.73	126.98	84.50
20,000 Gallons	43.94	47.46	70.70	77.46	71.69	913.04		193.53	155.22	100.50
30,000 Gallons	43.94	47.46	102.80	109.56	83.19	1,343.04		290.53	225.82	140.50

\* Available data for Red River is for Dec. 2014, 6 kgal only.

## DIVISION 5. - SEWER RATES

### Sec. 40-201. - Sewage service rate schedules.

- (a) Residential rate service schedule 6-A is applicable only for normal domestic sewer service for individual residences, dwelling units, and individual apartments, where each unit is individually metered for water.
- (b) Residential rate service schedule 6-G is applicable only for normal domestic sewer service for multi-family dwelling units, individual apartments, and subdivisions or residential complexes where each unit is not individually metered by the county for water.
- (c) Commercial rate service schedule 6-K is applicable to all nonresidential sewer services.
- (d) Customer charges. Each account shall be billed a customer charge of ~~\$10.27~~\$11.09 per month per account.
- (e) Fixed charges.
  - (1) To each customer billed under rate service schedule 6-A, ~~\$37.48~~\$40.15 per month per dwelling unit.
  - (2) To each customer billed under rate service schedule 6-G, ~~\$30.97~~\$33.45 per month per dwelling.
  - (3) To each customer billed under rate service schedule 6-K:

Water Meter Size	Service Charge Per Month
Under 2 inch	Reserved
2 inch	Reserved
3 inch	Reserved
4 inch	Reserved
6 inch	Reserved

- (f) Variable rate. The variable rate shall be applicable to customers billed under rate service schedule 6-K. The variable rate shall be ~~\$17.50~~\$18.90 per 1,000 gallons.

(Ord. No. 74-77, § 1, 1982; Ord. No. 74-109, § 1, 1984; Ord. No. 85-25, § 1, 1985; Ord. No. 85-53, § 1, 1986; Ord. No. 85-143, § 1, 1991; Ord. No. 85-204, § 1, 1994; Code 1985, § 13.20.010; Ord. No. 85-273, § 1, 1999; Ord. No. 02-016, § 1, 10-8-2002; Ord. No. 02-051, § 1, 2-8-2005; Ord. No. 02-089, § 1, 6-12-2007; Ord. No. 02-105, § 1, 11-17-2009; Ord. No. 02-220, § 1, 8-2-2011; Ord. No. 02-229, § 1, 2-26-2013; Ord. No. 02-276, § 1, 7-25-2017)

~~Editor's note—Section 3 of Ord. No. 02-229, states:~~ Amended rates shall be applied at the next billing following effective date of this ordinance.

Sec. 40-202. - Determination of charges.

- (a) Residential customers will be billed for sewer service the customer charge pursuant to section 40-201 (d) plus the fixed charge applicable pursuant to section 40-201 (e) plus, if applicable, charges under section 40-203. For calculation of charges under section 40-203 the volume measurement for residential customers will be 1,000 gallons multiplied by the number of occupants of the residence.
- (b) Commercial customers will be billed for sewer service the customer charge applicable pursuant to section 40-201 (d) plus, if applicable, charges under section 40-203, plus an amount equal to the variable rate multiplied by the customer's adjusted monthly average usage of potable water, as metered during the previous winter measuring period or other measuring period as determined appropriate by the department of public utilities based on seasonal or other nontraditional water usage pattern. The minimum variable amount shall be 2,000 gallons.
- (c) Adjustment factor. An adjustment factor to convert the expected billing volume to the volume expected to be treated shall be added to all volume based billings. This factor shall be ~~16~~8 percent.
- (d) The winter measuring period is defined as the three consecutive billing periods beginning with the billing period with a billing date in the month of December. The monthly average usage of potable water metered during the winter measuring period shall apply for a 12-month period beginning on the first day of the billing cycle that falls in the month of April of the year in which the winter measuring period ends.
- (e) In the event the customer's water usage was initiated after the commencement of the previous winter measuring period, the monthly average usage of potable water shall be deemed to be equal to the average monthly usage of potable water for other comparable customers within the same class in the county.

(Ord. No. 85-25, § 1, 1985; Code 1985, § 13.20.020; Ord. No. 02-016, § 2, 10-8-02; Ord. No. 02-051, § 2, 2-8-2005; Ord. No. 02-089, § 2, 6-12-2007; Ord. No. 02-229, § 2, 2-26-2013; Ord. No. 02-276, § 2, 7-25-2017)

Sec. 40-203. - Sewage system usage surcharge.

- (a) When biochemical oxygen demand, suspended solids or other pollutant concentrations from any customer exceed the range of concentration of these pollutants in normal domestic sewage, a surcharge that will be added to the base sewage usage charge will be calculated as follows:

$$Cs = [Bc (B) + Sc (S) = Pc (P)] Vx$$

Cs	=	a surcharge for wastewaters of excessive strength
Bc	=	O & M cost for treatment of a unit of biochemical oxygen demand (BOD)
B	=	concentration of BOD from a user above base level
Sc	=	O & M cost for treatment of a unit of suspended solids

S	=	concentration of suspended solids from a user above base level
Pc	=	O & M cost for treatment of a unit of any pollutant
P	=	concentration of any pollutant from a user above base level
Vx	=	volume contribution from a user per month as determined under determination of average usage

- (b) All measurements, tests and analyses used in calculating the sewage usage surcharge shall be performed according to the provisions of article IV of this chapter.

(Ord. No. 85-25, § 1, 1985; Code 1985, § 13.20.030)

Sec. 40-204. - Industrial cost recovery assessment.

- (a) Each industrial user shall pay its annual share of the total amount of any and all U.S. Environmental Protection Agency Water Pollution Control Construction grants and grant amendments for wastewater treatment works, each year for the useful life of the projects for which the grants were given, or 30 years, whichever is less. An industrial user's share shall be based on all factors which significantly influence the cost of the treatment works such as strength, volume and delivery flow rate. As a minimum, the industry's share shall be proportionate to its flow in relation to treatment works flow capacity. This charge shall be reviewed annually to determine if there has been a substantial change in the characteristics of the industrial customer's sewage; if there has been such a change, the customer's share shall be adjusted accordingly. An industrial user's share shall include only that portion of the grant assistance allocable to its use or to capacity firmly committed to its use. Payments of the industrial cost recovery charge shall be made annually with the first payment due one year after the customer begins use of the treatment works.
- (b) Any industrial user or other party affected by the industrial cost recovery policy of the county may request an administrative hearing before the utilities manager regarding the reasonableness of the allocations and industrial cost recovery assessments imposed upon them, or the administration of the industrial cost recovery system. The industrial user, or other affected parties, may at their option appeal the results of the administrative hearing to either or both the board of public utilities and the council.
- (c) Certain industrial users shall be excluded from the application of the industrial cost recovery assessment if they fall within the following categories:
- (1) Industrial users which discharge only non-process, segregated domestic wastes or wastes from sanitary conveniences;
  - (2) Any industrial user which discharges 25,000 gallons per day or less of sanitary waste or a volume of process waste, or combined process and sanitary waste equivalent to 25,000 gallons per day or less of sanitary waste, if the discharge does not contain pollutants which interfere, or are incompatible with, or contaminate, or reduce the utility of sludge.
- (d) The term "industrial user," as used for industrial cost recovery, shall mean any non-governmental user of publicly owned treatment works identified in the Standard Industrial Classification Manual, 1972, U.S. Office of Management and Budget, as amended and supplemented, under the following divisions:

- (1) *Division A: Agriculture, Forestry and Fishing;*
- (2) *Division B: Mining;*
- (3) *Division D: Manufacturing;*
- (4) *Division E: Transportation, Communications, Electric, Gas and Sanitary Services;*
- (5) *Division I: Services.*

(Ord. No. 85-25, § 1, 1985; Code 1985, § 13.20.040)

Sec. 40-205. - Special tax and assessment clause.

Billings under schedules defined in this article may be increased by an amount equal to the sum of the taxes payable under the Gross Receipts and Compensating Tax Act, NMSA 1978, § 7-9-1 et seq., and all other taxes, fees, or charges (exclusive of ad valorem, state, and federal income taxes) payable by the county utilities department and levied or assessed by any governmental authority on the sewer service rendered, or on the right or privilege of rendering the service, or on any object or even incidental to the rendering of the service.

(Ord. No. 85-153, § 1, 1992; Code 1985, § 13.20.050)

Secs. 40-206—40-240. - Reserved.



# County of Los Alamos

## Staff Report

July 18, 2018

Los Alamos, NM 87544  
www.losalamosnm.us

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**Agenda No.:** 7.B  
**Index (Council Goals):** BCC - N/A  
**Presenters:** Steve Cummins, Deputy Utilities Manager - Power Supply  
**Legislative File:** 10951-18

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### **Title**

Preliminary Assessment of Electric Vehicle (EV) Charging Stations

### **Recommended Action**

**No Recommendation, for information only.**

### **Staff Recommendation**

None

### **Body**

On January 20, 2016, the Board of Public Utilities adopted several strategic Initiatives for Electrical Energy Resources. One of the recommendations was to "Support replacement of petroleum-fueled motor vehicles with all-electric vehicles. Consider locating more electric vehicle charging stations around the County or at LANL." Installing EV charging stations around the county will help to support people that have too long of a commute to complete on one charge, as well as reduce "range-anxiety" for people driving EVs.

DPU has been investigating EV charging stations, and will present its findings. These findings involve the different types of stations, suggested locations for Los Alamos County, station vendors and services, and estimated costs involved in implementing stations. Staff plans to solicit a Request for Proposals (RFP) to gather cost and installation information from the different vendors. The proposals will include a siting assessment by the vendors as a confirmation of the locations selected by staff. After staff has evaluated the proposals and determines which proposal best meets the needs of the County, staff will ask the BPU for approval at a future Board meeting.

### **Alternatives**

Not approve DPU placing charging stations and pursue other methods of supporting electric vehicles.

### **Fiscal and Staff Impact**

None, for information only.

### **Attachments**

A -EV Charging Report July 2018  
B - EV Powerpoint July 2018

## Potential EV Charging Stations in Los Alamos County

By Tyler Mabraten  
Engineering Intern  
County of Los Alamos – Department of Public Utilities  
06/19/2018

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## Introduction

As the popularity of electric vehicles (EVs), and plug in hybrids (PHEVs) increases, the infrastructure to support them needs to increase accordingly. The difficulty is choosing public charging stations that are both convenient, and compatible with the types of vehicles that customers are driving.

There are three different levels of electric vehicle charging stations:

### *Level 1:*

This is plugging the vehicle in to a standard 120V wall outlet. It is the slowest method of charging an electric vehicle, and will fully charge a Tesla Model S P100d in 4 days [1]. These chargers typically charge at around 1kW and are more commonly used for plug-in hybrids or EVs with smaller batteries. [2]

### *Level 2:*

These are 240V electric car charging stations. They use the J-1772 plug, which is standard in the United States [2] and can charge with 3-20kW[2]. They will charge a Tesla Model S P100d in 6-30 hours depending on the output of the station [1].

### *Level 3:*

These are 480V “fast charging” stations also known as DC Fast Chargers (DCFC). Not all vehicles are compatible with level 3 stations, especially PHEVs. They typically charge with 50kW of power [2]. There are two different connectors used by Level 3 charging stations CHAdeMO, typically used by Asian manufactured EVs, and SAE combo, typically used by American and European manufactured EVs. Tesla uses its own standard connector. Level 3 stations will charge a Nissan Leaf from dead to 80% charge in 40 minutes [3].

### *Tesla Superchargers:*

Tesla superchargers are the fastest chargers currently available, but are only compatible with Tesla vehicles. They will give a Tesla up to 170 miles of range in 30 minutes of charging [1].

## Charging Station Solutions

Level 2 chargers are preferred for Los Alamos County due to their comparatively low cost, availability, and compatibility with all commercial EVs. These chargers will charge EVs quickly enough to be useful, and are more common than DC Fast Chargers. There are two main categories of public EV chargers; networked, and non-networked. Networked chargers are part of large networks that use their own pay system. Charging networks collect data and manage customer payments, as well as monitor station status. There are 14 different EV networks. These have been narrowed down to three potential networks for Los Alamos County based on availability in the US and ability to set our

own pricing system. The three networks with the most relevance for Los Alamos County are:

- SemaConnect
- ChargePoint
- Greenlots

Non-networked stations are not part of a network, and are privately owned and operated. Brands of non-networked charging stations that offer a payment system are:

- EMotorwerks JuiceStation (not yet available)
- EVSE LLC

### ***SemaConnect:***

#### Features:

- Ability to pay per kilowatt hour
- 24/7 Driver Support
- Connect via cell network for station monitoring
- SemaConnect does not take any driver revenue
- Drivers start charging via an RFID card, website, or mobile app
- Mobile app allows drivers to be notified when the vehicle is done charging and to see if the station is available
- 1 year full replacement warranty

#### Costs:

- \$3190 + install for a single station
- \$6380 + install for a dual station
- \$600 for optional cord management system
- \$240 per plug per year service charge
- 3% bank processing fee on driver revenue

### ***ChargePoint:***

#### Features:

- Ability to pay per kilowatt hour
- 24/7 Driver Support
- Connect via cell network for station monitoring
- Sourcewell (NJPA) member
- Ability to set multiple rate systems
- Drivers start charging via RFID card or ChargePoint App

#### Costs:

- \$10,000 + install for dual station and 60 months of service charge
- \$280 per plug per year service charge
- ChargePoint takes 10% of driver revenue for administrative costs

### **EVSE LLC:**

#### Features

- Ability to charge per kilowatt hour
- Customers are charged using their credit card
- Optional software to collect data on usage
- Modular-ability to replace individual parts
- Ability to add payment module later
- RFID cards to charge fleet vehicles

#### Costs

- \$200 per plug per year for optional software

### **Greenlots:**

#### Features

- Open Charge Point Protocol (OCPP) compliant
- Ability to charge per kilowatt hour
- Different hardware options
- Can use a different software without changing hardware
- Charging via credit card reader, RFID card, phone app, or call to start charging
- 

#### Costs

- \$4500 for station
- \$150 per year per station data connection fee
- \$425 per year per port software fee
- \$150 one time commissioning fee

## **EV Infrastructure Currently in Los Alamos County**

There are currently three public EV charging stations in Los Alamos County in addition to the private LANL stations.

<b>Location</b>	<b>Level</b>	<b>Network</b>	<b>Plug Type</b>	<b>Cost</b>	<b>Plugs</b>
Del Norte Credit Union	2	Non-Networked	J-1772	Free	1
MUNI Building	2	Non-Networked	J-1772	Free	6
Los Alamos Nature Center	2	Non-Networked	J-1772	Free	2
LANL	2	Chargepoint	J-1772	\$.50/hr	N/A

The stations that have been put in place outside the MUNI building are Schneider Electric EV Link EV230PDRs. They have been discontinued and not replaced with a later model [4]. The Schneider Electric EV230PDRR is still available for \$4600, but require RFID cards and is designed for fleet charging, not public use. There is no payment system for the current units.

LANL uses two different types of EV charging stations: the Schneider Electric EV230PDRR for their fleet vehicles, and Chargepoint stations of public use. For the public charging stations LANL charges \$.50 per hour parked.

## **EV Infrastructure in Cities Surrounding Los Alamos**

There are 19 charging stations in Santa Fe, and 23 in Albuquerque. Of these, 4 are networked in Santa Fe, and 10 in Albuquerque. The networks used are as follows

### **Santa Fe**

- 1 EVgo
- 1 Blink
- 2 Chargepoint

### **Albuquerque**

- 3 Greenlots
- 7 Chargepoint

## **Potential EV Charging Sites**

A good location for EV charging sites meets the following criteria:

- Locations where a person is likely to stay an hour or more
- Locations that have access to retail/tourist locations
- Locations where vehicles are likely to park

Level 2 chargers will probably be best for the following sites, due to the long times that people stay. This will enable people to use the spots for parking as well.

### **Los Alamos:**

#### Mesa Library

- People stay for long periods of time
- Park n Ride – Potential Federal Funding

#### Ashley Pond Park

- Downtown access
- Tourist area

### **White Rock:**

#### Visitors Center-Bandelier National Park

- Tourist area
- People stay for long periods of time
- Already has power hookups for RVs

### White Rock Library

- People stay for long periods of time
- Local White Rock traffic

## **Potential Sources of Funding**

### **Surface Transportation Block Grant Program:**

The Surface Transportation Block Grant Program (STBG) is a federal fund set up to address state and local transportation needs. Funds from this program provide for the construction of EV charging stations associated with truck parking facilities and fringe and corridor parking facilities.

### **Sourcewell (NJPA):**

Los Alamos is a member of Sourcewell (formerly National Joint Powers Alliance). Chargepoint is also a member, and offers discounted pricing for Sourcewell members. Due to the nature of cooperative purchasing, the project would also not have to go to bid, because of the cooperative purchasing program.

## **Revenue**

There are two ways to charge customers, per kWh of electricity used, or per hour spent plugged into the station. Charging customers per hour spent plugged into the station would discourage customers from spending extended periods of time plugged into the station even when their vehicle finishes charging. If customers decide to remain plugged into the station, they will be charged for the time another EV driver could potentially be using the station.

At this time, it is not possible to predict revenue accurately without placing stations in Los Alamos County to collect usage data. For this reason, calculations have been completed using the LANL rate of \$.50/hr, and a conservative usage rate of 3 hours per plug per day. The calculations also assume that the vehicles are charging at a constant rate of 7.6kW per hour, which is on the higher end of what most EVs and PHEVs charge with. DPU paid 4.4 cents per kWh of wholesale electricity in 2017, and that number has been used for this calculation.

$$(3 \text{ hrs/day})(365 \text{ day/yr}) = 1,095 \text{ hours of plug usage per year}$$

$$(1,095\text{hrs})(\$ .5) = \$547.50 \text{ of plug revenue per year}$$

$$\$547.50 - (7.6\text{kW})(1,095\text{hrs})(\$ .044) = \$181.33 \text{ per plug per year}$$

The station revenue of \$181.33 will pay for most of the software and data fees. While it will not pay for the cost of infrastructure, installing stations now will place Los Alamos County in a position to support electric vehicles in the future.

## **Recommendation**

Car manufacturers have released statements of plans to release many new models of electric cars by 2020. As the percentage of electric vehicles on the road increases, LAC needs to add infrastructure to support these new vehicles. By placing trial stations and collecting usage data, LAC will be able to determine how best to support the growing number of EVs in the future.

## **Works Cited**

- [1] <https://www.pluglesspower.com/learn/tesla-model-s-charging-home-public-autonomously/>
- [2] <https://chargehub.com/en/electric-car-charging-guide.html>
- [3] <https://www.nissanusa.com/vehicles/electric-cars/leaf/range-charging.html>
- [4] <https://www.schneider-electric.us/en/product/EV230PDR/evlink-level-2-pedestal-mounted-dual-7.2kw-exterior-charging-station/>
- [5] <https://www.plugshare.com>

## **Works Consulted**

<https://www.plugshare.com/>

<https://evobsession.com/electric-car-charging-101-types-of-charging-apps-more/>

<http://www.plugincars.com/ultimate-guide-electric-car-charging-networks-126530.html>

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<http://www.govtech.com/fs/Building-Out-Electric-Vehicle-Infrastructure-Where-Are-the-Best-Locations-for-Charging-Stations.html>

<https://www.ijcai.org/Proceedings/15/Papers/377.pdf>

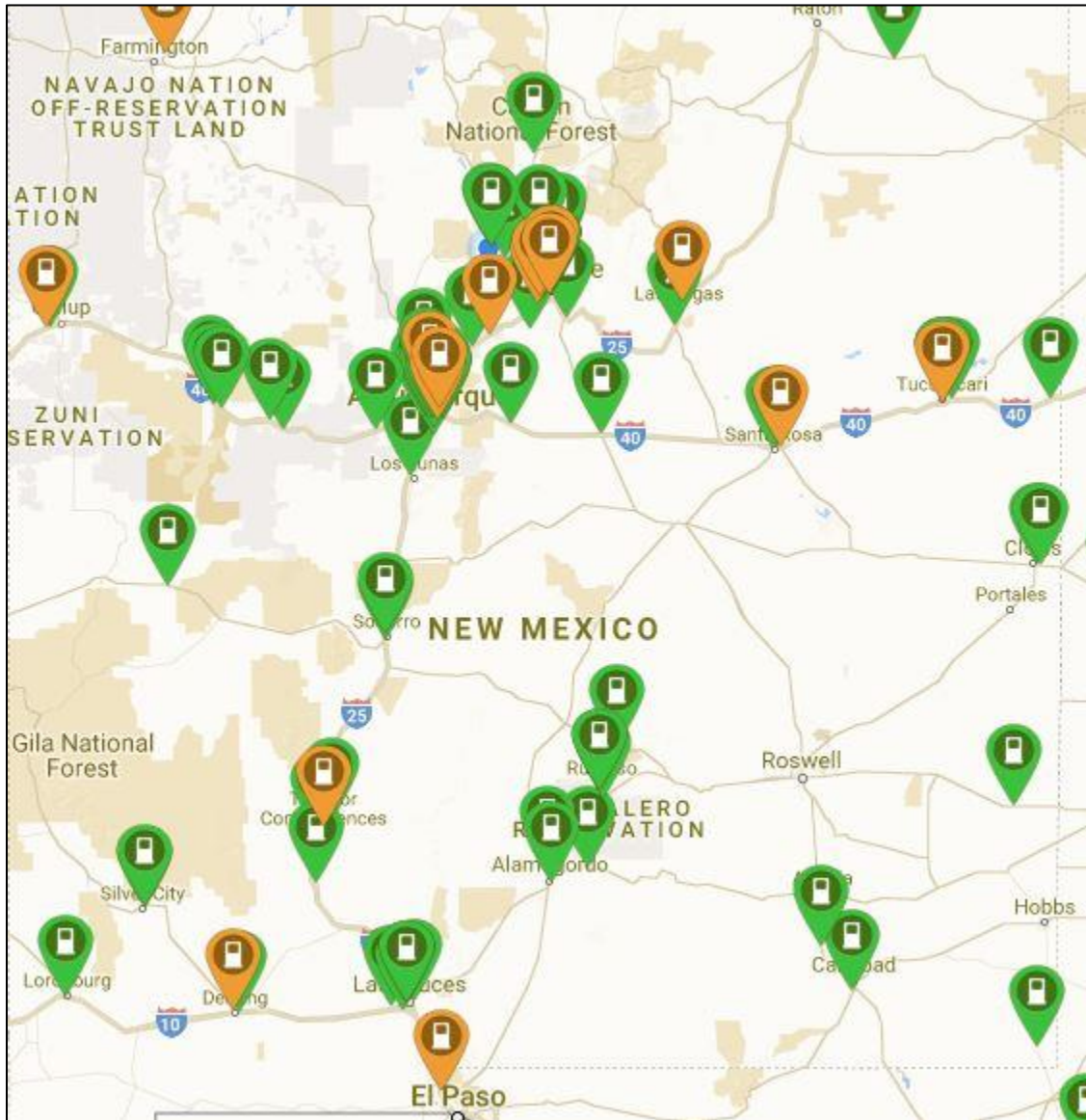
<https://www.fhwa.dot.gov/specialfunding/stp/>

<https://luskin.ucla.edu/sites/default/files/Non-Residential%20Charging%20Stations.pdf>

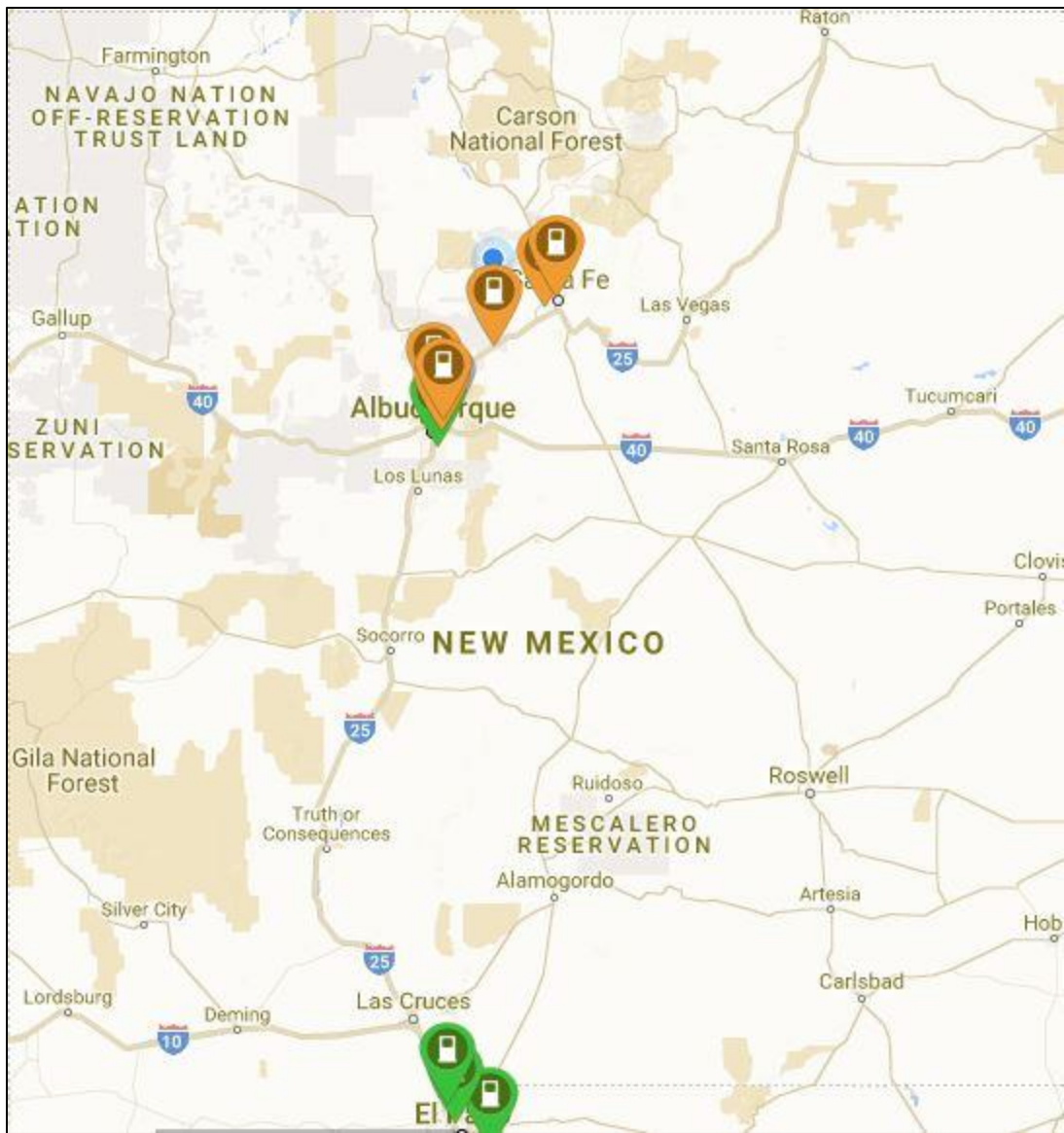
<http://evsellc.com/solutions/payment-solutions/>

<https://emotorwerks.com/products/charging-stations/juicestation>

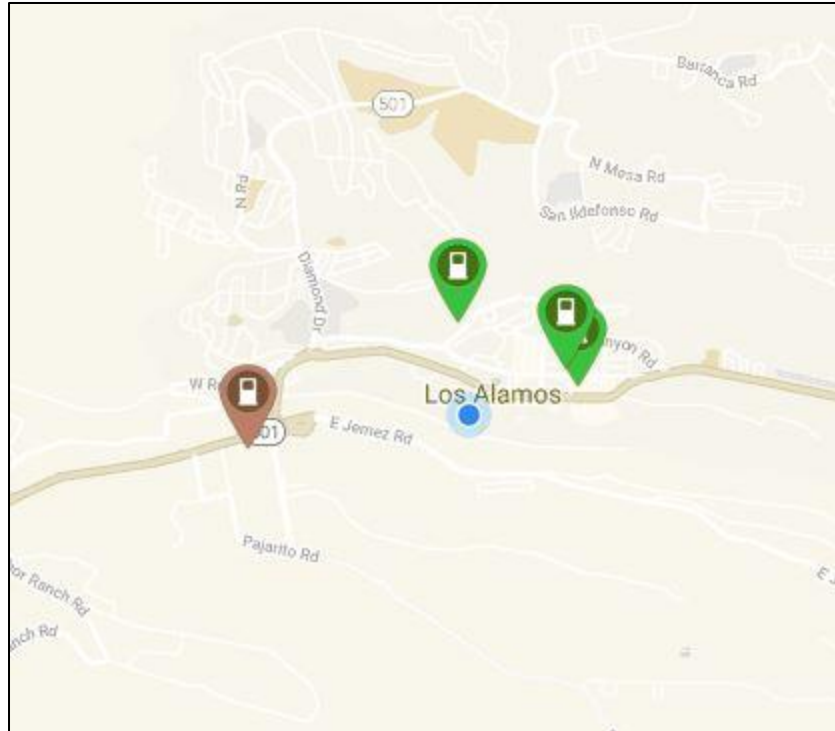
## Appendix A: Maps of Existing Stations



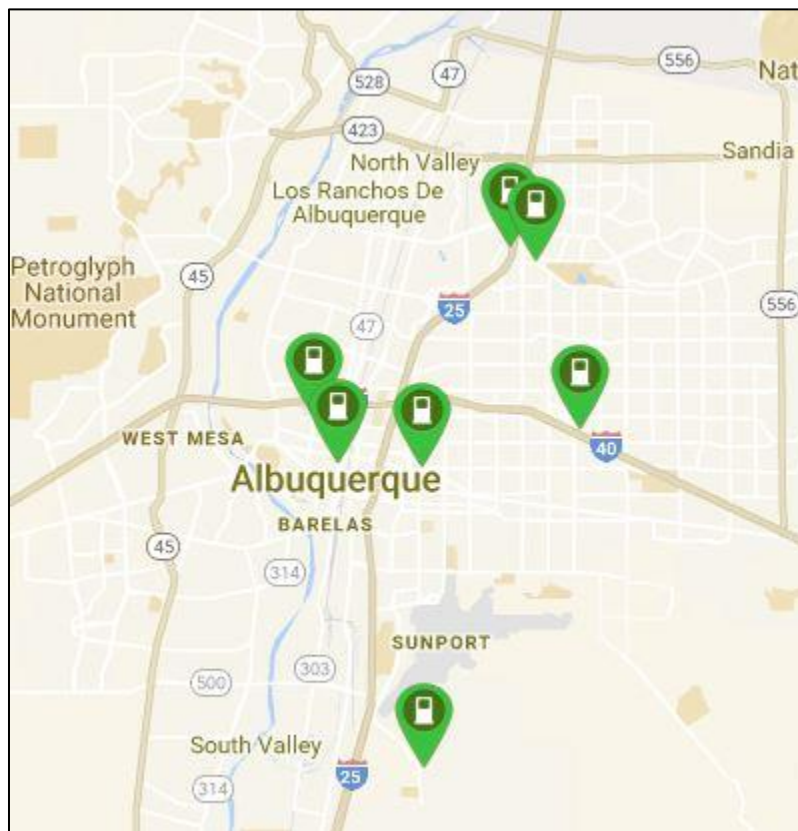
*Figure 1: Map of all EV Charging Ctations in New Mexico*



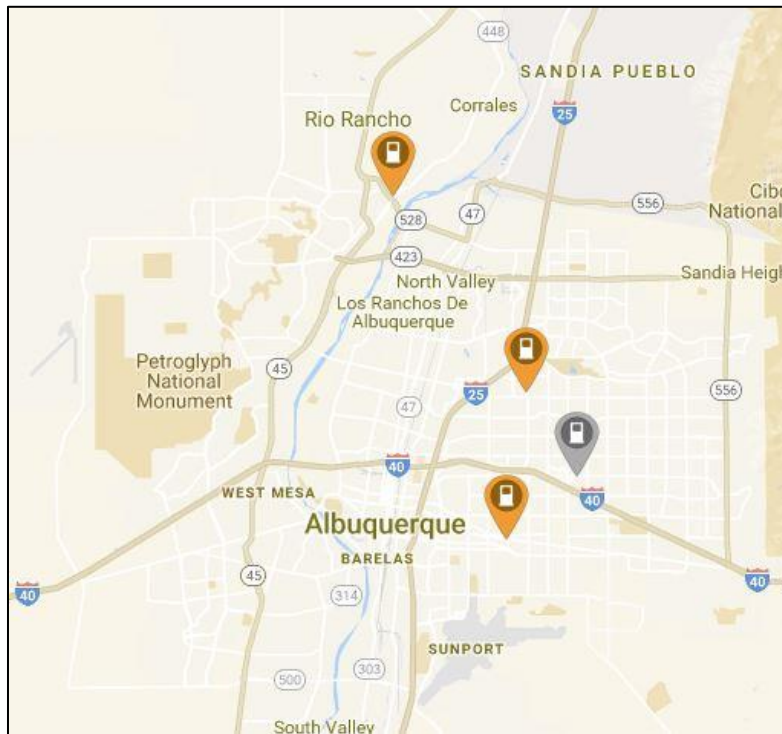
*Figure 2: Map of Networked Stations in New Mexico*



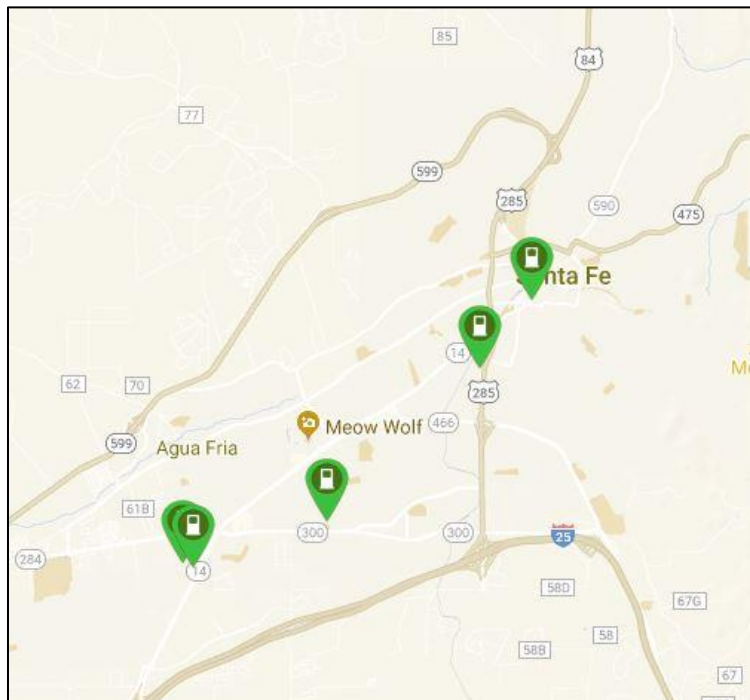
*Figure 3: Stations in Los Alamos*



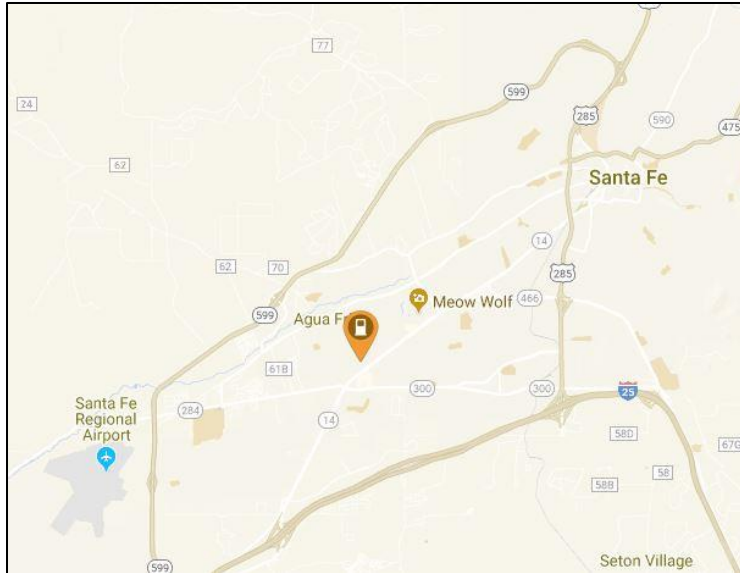
*Figure 4: Chargepoint Stations in Albuquerque*



*Figure 5: Greenlots Stations in Albuquerque*



*Figure 6: Chargepoint Stations in Santa Fe*

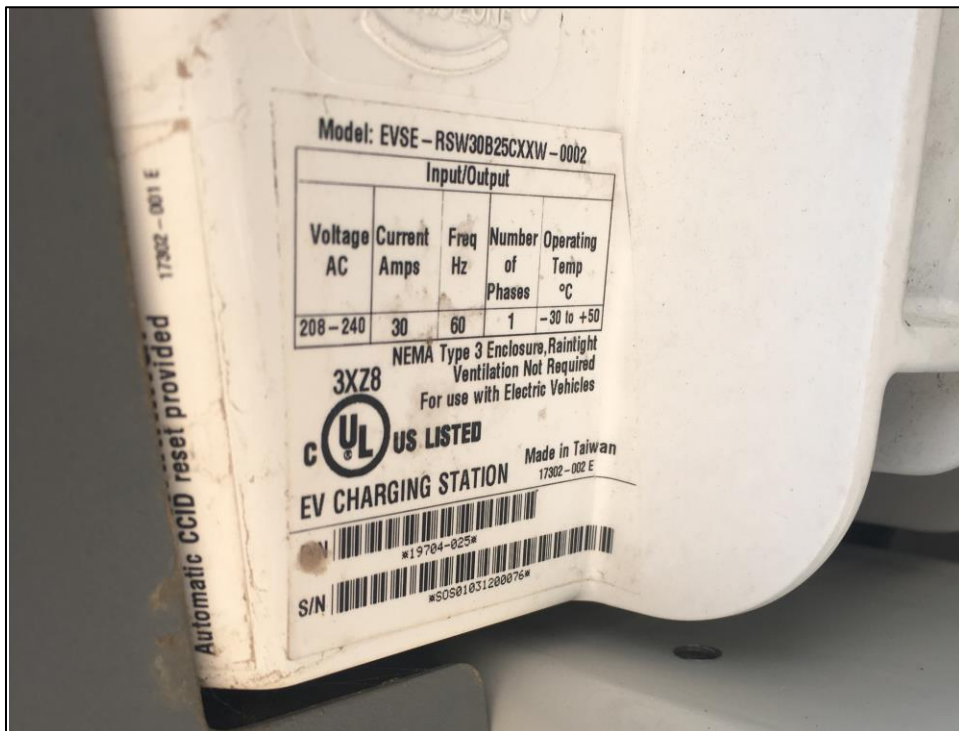


*Figure 7: Greenlots Stations in Santa Fe*

## Appendix B: Photos of Current Infrastructure



*Figure 1: Del Norte Credit Union Station*



*Figure 2: Del Norte Credit Union Station Information*



Figure 3: Nature Center Charging Station

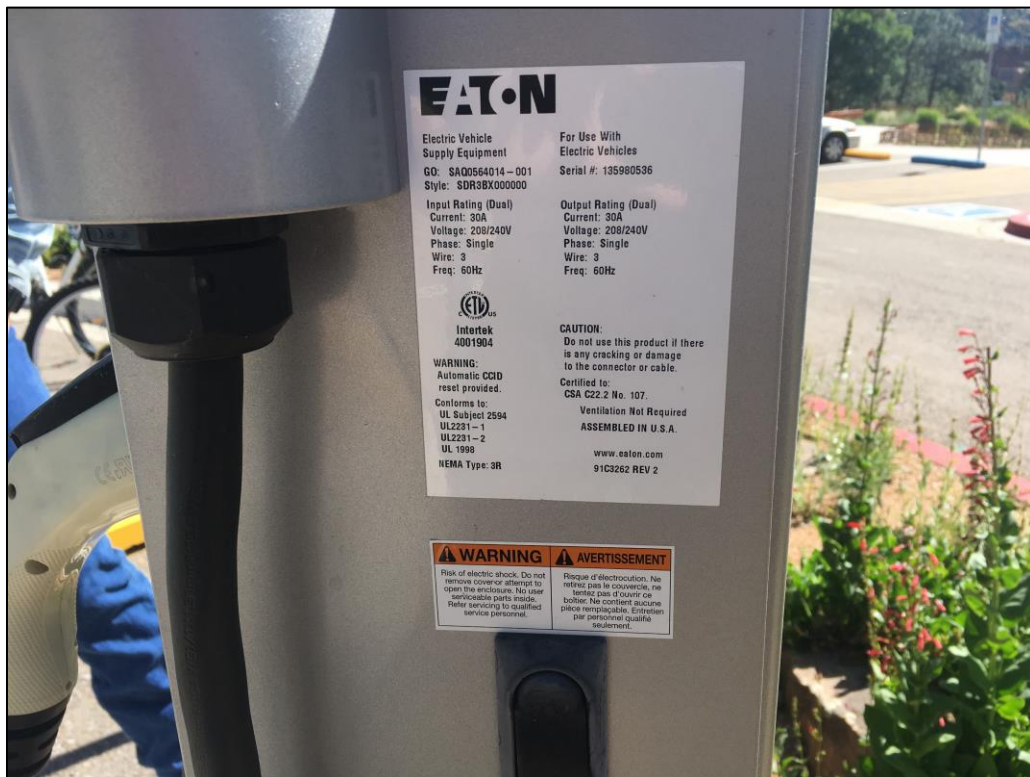


Figure 4: Nature Center Charging Station Information



*Figure 5: LANL Chargepoint Stations*



*Figure 6: LANL Schneider Electric Station*



Figure 7: LANL Schneider Electric Information

## Appendix C: Charging Station Information



### CT4000 Level 2 Commercial Charging Stations

#### Specifications and Ordering Information

#### Ordering Information

Specify model number followed by the applicable code(s).  
The order code sequence is: **Model-Options, Software, Services**  
and **Misc** are ordered as separate line items.

#### Hardware

Description		Order Code
Model	1830 mm (6') Single Port Bollard Mount	CT4011
	1830 mm (6') Dual Port Bollard Mount	CT4021
	1830 mm (6') Single Port Wall Mount	CT4013
	1830 mm (6') Dual Port Wall Mount	CT4023
	2440 mm (8') Dual Port Bollard Mount	CT4025
	2440 mm (8') Dual Port Wall Mount	CT4027
Options	Integral Gateway Modem - USA	-GW1
	Integral Gateway Modem - Canada	-GW2
Misc	Power Management Kit	CT4000-PMGMT
	Bollard Concrete Mounting Kit	CT4001-CCM

#### Software & Services

Description	Order Code
ChargePoint Commercial Service Plan	CTSW-SAS-COMM- <sup>1</sup> n
ChargePoint Service Provider Plan	CTSW-SAS-SP- <sup>1</sup> n
ChargePoint Assure	CT4000-ASSURE <sup>2</sup> n
Station Activation and Configuration	CPSUPPORT-ACTIVE
ChargePoint Station Installation and Validation	CT4000-INSTALLVALID

Note: All CT4000 stations come with 1 year of ChargePoint Assure coverage at no charge for qualified installations. Other conditions apply. All CT4000 stations require a network service plan.

<sup>1</sup> Substitute n for desired years of service (1, 2, 3, 4, or 5 years).

<sup>2</sup> Substitute n for the duration of the additional coverage (1, 2, 3, or 4 years).

#### Order Code Examples

If ordering this	the order code is
1830 mm (6') Dual Port Bollard USA Gateway Station with Concrete Mounting Kit	CT4021-GW1 CT4001-CCM
ChargePoint Commercial Service Plan, 3 Year Subscription	CTSW-SAS-COMM-3
ChargePoint Station Installation and Validation	CT4000-INSTALLVALID
2 Additional Years of Assure Coverage	CT4000-ASSURE2
1830 mm (6') Single Port Wall Mount Station	CT4013
ChargePoint Commercial Service Plan, 5 Year Subscription	CTSW-SAS-COMM-5
4 Additional Years of Assure Coverage	CT4000-ASSURE4
Station Activation and Configuration	CPSUPPORT-ACTIVE



CT4021



# SemaConnect 6 Series Charging Station

The perfect EV Charging solution

The electric vehicle generation is happening now. With the SemaConnect Station, you won't be a part of the green movement.

**You'll lead it.**



semaconnect.com | 1(800) 663-5633

## Appendix D: Sample Quotes



### Electric Vehicle Charging Station Order Form

<b>Prepared By</b>	Connie Meehan	<b>Quote Name</b>	City Stations
<b>Email</b>	connie.meehan@semaconnect.com	<b>Quote Number</b>	Q-08261
<b>Phone</b>	(970) 420-0391	<b>Created Date</b>	6/11/2018
<b>Bill To Name</b>	Los Alamos County-Department of Public Utilities	<b>Phone</b>	676-322-8627
<b>Contact Name</b>	Tyler Mobraten	<b>Email</b>	tyler.mobraten.work@gmail.com
<b>Bill To</b>	tbd Los Alamos, NM	<b>Ship To</b>	tbd

SemaConnect is pleased to extend this offer of Electric Vehicle Charging Station products and services. By signing this document you are committing to order the charging station solution as defined below.

#### Product and Services Description

- SemaConnect Commercial-Grade Smart EV Charging Station(s) with Mounting Device(s)
- Full Service Program Includes:
  - Network Service Program: Cloud-based management software, 1-800 driver support, dedicated cellular data communications and 24x7x365 state-of-health monitoring.
  - Warranty Program: Full Replacement Service with no repair cycle

Product	List Price	Discount \$	Quantity	Subtotal
SemaConnect S6 Charging Stations w/ One Year Full Service - Dual Pedestal	\$7,180.00	\$800.00	1.00	\$6,380.00
Network Service Fee Per Month \$40	Total Price			\$6,380.00

Note: Network Service Fees begin after Full Service Program is complete

**Delivery Schedule** Delivery within 3 week(s) of placing the Order

This signed document shall serve as a Purchase Order for the proposed project

Price does not include shipping fees or sales tax  
Quoted price is valid for 30 days from Created Date

- Shipment within 60 days of Order: Invoice for 100% of project price upon shipment with Net 30 day terms
- Shipment 60 days or greater of Order: Invoice for 25% upon order placement, 75% upon shipment with Net 30 day terms

Accepted by:  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Signature: \_\_\_\_\_  
Date: \_\_\_\_\_



Product Name	Product Description	Qty	List Price	Disc%	Unit Price	Total Price
CPSUPPORT-SITEVALID	Customer works with their own contractor to perform the construction and station installation. CPSUPPORT-SITEVALID is used to validate that a customer installation has been performed per ChargePoint published requirements. The on-site validation of electrical capacity, transformers, panels, breakers, wiring, cellular coverage and that the station installation meets all ChargePoint published requirements and local codes. A site is defined as a group of stations all connected to the same gateway station. CPSUPPORT-SITEVALID is priced per gateway station and used when the customer is not using an O&M Partner or self-validating Channel Partner to install their stations. Note that a failed Site Validation will incur a second validation fee to repeat the validation after the site deficiencies are corrected. A successful Site Validation is a prerequisite to purchase ChargePoint Assure.	1	USD 599	0	USD 599	USD 599
CT4021-GW1	Dual Output Gateway Option USA, Bollard Unit - 208/240V @30A with Cord Management	1	USD 7,210	20	USD 5,768	USD 5,768
CT4001-CCM	CT4000 Bollard Concrete Mounting Kit. Bolts: 5/8 - 11 x 9" F1554 Grade 55 hot-dipped galvanized threaded bolts - 3 ea. Nuts: 5/8 - Heavy Galvanized Hex Nuts (DH Rated) - 12 ea. Washers: Galvanized Washers (ASTM F436) - 9 ea. Plastic Template - 1 ea	1	USD 95	0	USD 95	USD 95
CT4000-ASSURE1	1 prepaid year of ChargePoint Assure.	1	USD 740	0	USD 740	USD 740

Quote Total: USD 8,111.00  
Shipping and Handling: USD 160.00  
Grand Total: USD 8,271.00

Sales tax in applicable states (AZ, CA, FL, GA, MA, NY, PA, TX, WA) and shipping fees will be applied to invoice.



Product Name	Product Description	Qty	List Price	Disc%	Unit Price	Total Price
CPSUPPORT-SITEVALID	Customer works with their own contractor to perform the construction and station installation. CPSUPPORT-SITEVALID is used to validate that a customer installation has been performed per ChargePoint published requirements. The on-site validation of electrical capacity, transformers, panels, breakers, wiring, cellular coverage and that the station installation meets all ChargePoint published requirements and local codes. A site is defined as a group of stations all connected to the same gateway station. CPSUPPORT-SITEVALID is priced per gateway station and used when the customer is not using an O&M Partner or self-validating Channel Partner to install their stations. Note that a failed Site Validation will incur a second validation fee to repeat the validation after the site deficiencies are corrected. A successful Site Validation is a prerequisite to purchase ChargePoint Assure.	1	USD 599	0	USD 599	USD 599
CT4021-GW1	Dual Output Gateway Option USA, Bollard Unit - 208/240V @30A with Cord Management	1	USD 7,210	20	USD 5,768	USD 5,768
CT4001-CCM	CT4000 Bollard Concrete Mounting Kit. Bolts: 5/8" - 11 x 9" F1554 Grade 55 hot-dipped galvanized threaded bolts - 3 ea. Nuts: 5/8" - Heavy Galvanized Hex Nuts (DH Rated) - 12 ea. Washers: Galvanized Washers (ASTM F436) - 9 ea. Plastic Template - 1 ea	1	USD 95	0	USD 95	USD 95
CT4000-ASSURE1	1 prepaid year of ChargePoint Assure.	1	USD 740	0	USD 740	USD 740

Quote Total: USD 8,111.00

Shipping and Handling: USD 160.00

Grand Total: USD 8,271.00

Sales tax in applicable states (AZ, CA, FL, GA, MA, NY, PA, TX, WA) and shipping fees will be applied to invoice.



## Quotation

ChargePoint, Inc.  
Driving a Better Way™  
chargepoint.com

Sales Representative: Andrew Croll  
E-Mail: andrew.croll@chargepoint.com  
Telephone: 9093005587

Quote Number: Q-30937-1  
Date: 6/19/2018  
Expires On: 6/19/2019

Primary Contact: Tyler Mabraten

**Bill To Address**  
Los Alamos County  
1000 Central Ave  
Los Alamos NM 87544  
US

**Ship To Address**  
Los Alamos County  
1000 Central Ave  
Los Alamos NM 87544  
US

SOURCE WELL (NJPA) PRICING  
60 Months Network / 60 Months Assure

Product Name	Product Description	Qty	List Price	Disc%	Unit Price	Total Price
CPSUPPORT-ACTIVE	Initial Station Activation & Configuration Service Includes activation of cloud services and configuration of radio groups, custom groups, connections, access control, visibility control, pricing, reports and alerts. One time initial service per station.	1	USD 349	100	USD 0	USD 0



Product Name	Product Description	Qty	List Price	Disc%	Unit Price	Total Price
CPSUPPORT-SITEVALID	Customer works with their own contractor to perform the construction and station installation. CPSUPPORT-SITEVALID is used to validate that a customer installation has been performed per ChargePoint published requirements. The on-site validation of electrical capacity, transformers, panels, breakers, wiring, cellular coverage and that the station installation meets all ChargePoint published requirements and local codes. A site is defined as a group of stations all connected to the same gateway station. CPSUPPORT-SITEVALID is priced per gateway station and used when the customer is not using an O&M Partner or self-validating Channel Partner to install their stations. Note that a failed Site Validation will incur a second validation fee to repeat the validation after the site deficiencies are corrected. A successful Site Validation is a prerequisite to purchase ChargePoint Assure.	1	USD 599	100	USD 0	USD 0
CT4021-GW1	Dual Output Gateway Option USA, Bollard Unit - 208/240V @30A with Cord Management	1	USD 7,210	20	USD 5,768	USD 5,768
CT4001-CCM	CT4000 Bollard Concrete Mounting Kit. Bolts: 5/8 - 11 x 9" F1554 Grade 55 hot-dipped galvanized threaded bolts - 3 ea. Nuts: 5/8 - Heavy Galvanized Hex Nuts (DH Rated) - 12 ea. Washers: Galvanized Washers (ASTM F436) - 9 ea. Plastic Template - 1 ea	1	USD 95	0	USD 95	USD 95
CPCLD-COMMERCIAL-S	5yr Prepaid Commercial Cloud Plan. Includes Secure Network Connection, On-going Station Software updates, Station Inventory, 24x7 Driver Support, Host Support, Session Data and Analytics, Fleet Vehicle Management and Integration, Fleet Access Control, Valet Dashboard, Power Management (Circuit, Panel, Site Sharing), Scheduled Charging, Driver Access Control, Pricing and Automatic Funds Collection, Waitlist, Videos (on supported hardware).	2	USD 1,105	0	USD 1,105	USD 2,210



Product Name	Product Description	Qty	List Price	Disc%	Unit Price	Total Price
CT4000-ASSURE5	5 prepaid years of ChargePoint Assure.	1	USD 2,495	0	USD 2,495	USD 2,495

Quote Total: USD 10,568.00  
Shipping and Handling: USD 160.00  
Grand Total: USD 10,728.00

Sales tax in applicable states (AZ, CA, FL, GA, MA, NY, PA, TX, WA) and shipping fees will be applied to invoice.

#### Quote Acceptance

- All pricing is confidential between Customer and ChargePoint.
- All prices are FCA ChargePoint warehouse(s).
- Customer to be invoiced at time of shipment.
- All invoices are Net 30 days. Credit checks are required for new customers.
- Pricing does not include installation or mounting services unless specifically quoted above.
- Additional Purchase Terms and Conditions can be found at <http://www.chargepoint.com/termsandconditions>
- Purchaser confirms that the shipping and billing information provided in the Quotation is accurate for ChargePoint's shipping and invoicing purposes.

By signing this quote I hereby acknowledge that I have the authority to purchase the product detailed on this document on behalf of my organization. Furthermore, I agree to the above terms and conditions and that this signed quote shall act as a purchase order.

Signature :

Title :

Name (Print) :

Date :

Company Name :

Requested Ship Date :

AP Contact Name :

AP Contact E-Mail :

# EV Charging Stations

# Why Charging Stations?

- FER directive to “Support replacement of petroleum-fueled motor vehicles with all-electric vehicles.”
- Industry is moving towards replacing petroleum vehicles with electric vehicles

# Car Makers and EVs

- GM plans to release 20 EV models by 2023
- Ford plans to release 13 EV models by 2023
- Jaguar-Land Rover plans to electrify its entire lineup by 2020
- Volvo states that every Volvo sold after 2019 will include an electric motor
- VW group plans to offer electric and hybrid versions of 300 vehicles by 2030

# Level 1 Chargers

- Slowest Method of Charging
- Charges with 1 KW at 120V

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# Level 2 Chargers

- Most common EV charging stations
- Charges with 3-20kW at 240V
- Uses standard SAE J-1772 Plug



# Level 3 Chargers

- Also known as DC Fast Charging (DCFC)
- Charge with 50kW at 480V
- Three connectors: SAE Combo, CHAdeMO, & Tesla

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# Charging Station Solutions

- Networked
  - SemaConnect
  - ChargePoint
  - Greenlots
- Non-Networked
  - EVSE LLC (Supports networked charge software)

# Charging Station Features

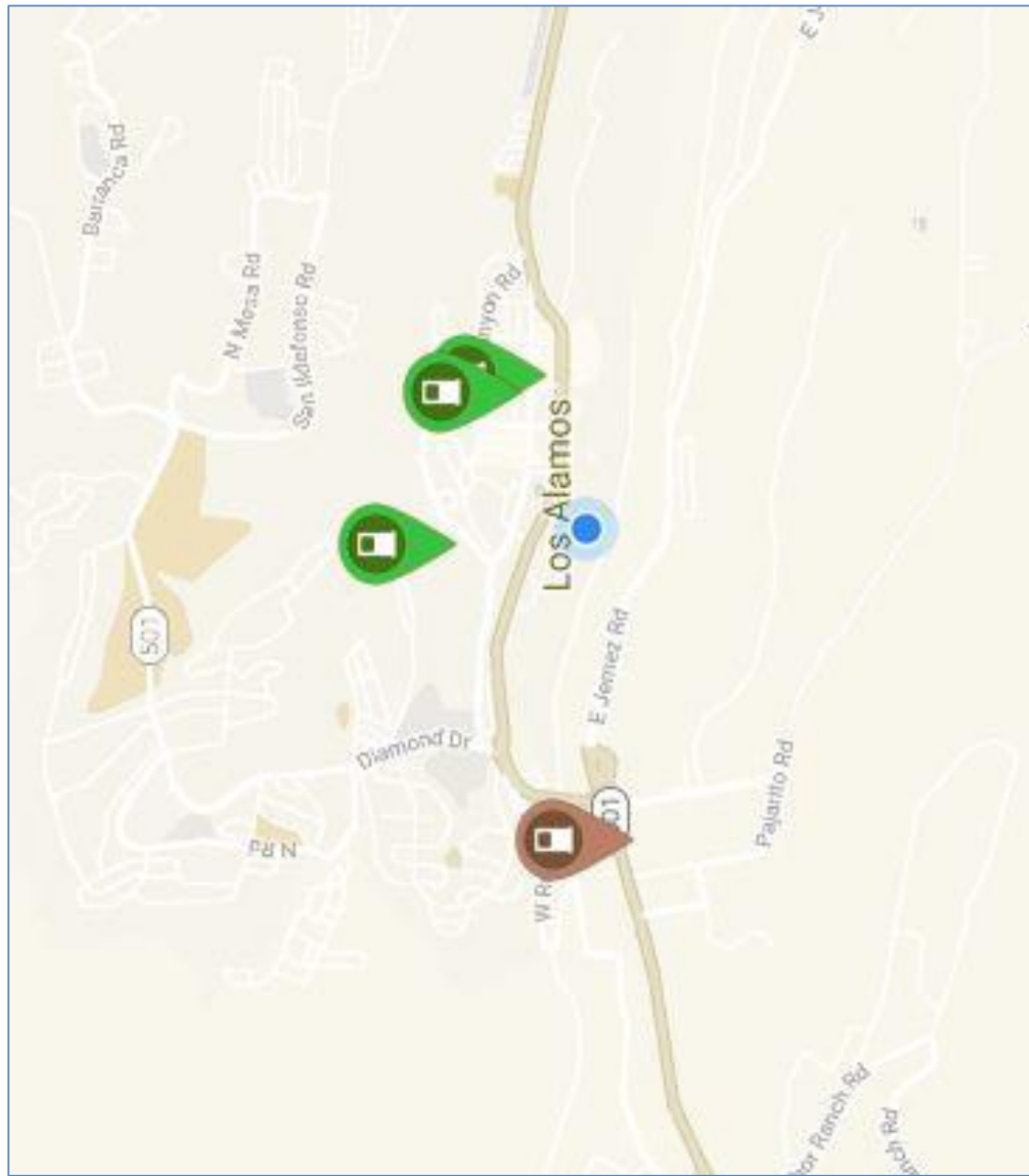
Vendor	OCPP Compliant	Payment Method	Owner sets rates	Notifies Drivers upon charge completion
SemaConnect	Yes	RFID, Website, App	Yes	Yes
ChargePoint	Yes	RFID, App	Yes	Yes
EVSE LLC	Yes	RFID, Credit Card	Yes	No
Greenlots	Yes	Credit card, RFID, App, Phone Call	Yes	Yes

# Charging Station Costs

Vendor	Station Cost	Data Fee	Service Fee	Other
SemaConnect	\$3190 Single \$6380 Dual	Included in service fee	\$250/plug/year	3% processing fee on revenue
Chargepoint	\$10,000 Dual	Included in service fee	Station cost includes 60 months \$280/plug/year	10% of driver revenue
EVSE LLC	Awaiting Quote	Included in Service Fee	\$200/plug/year	None
Greenlots	\$4500 Dual	\$150/year	\$425/plug/year	\$150 station commissioning fee

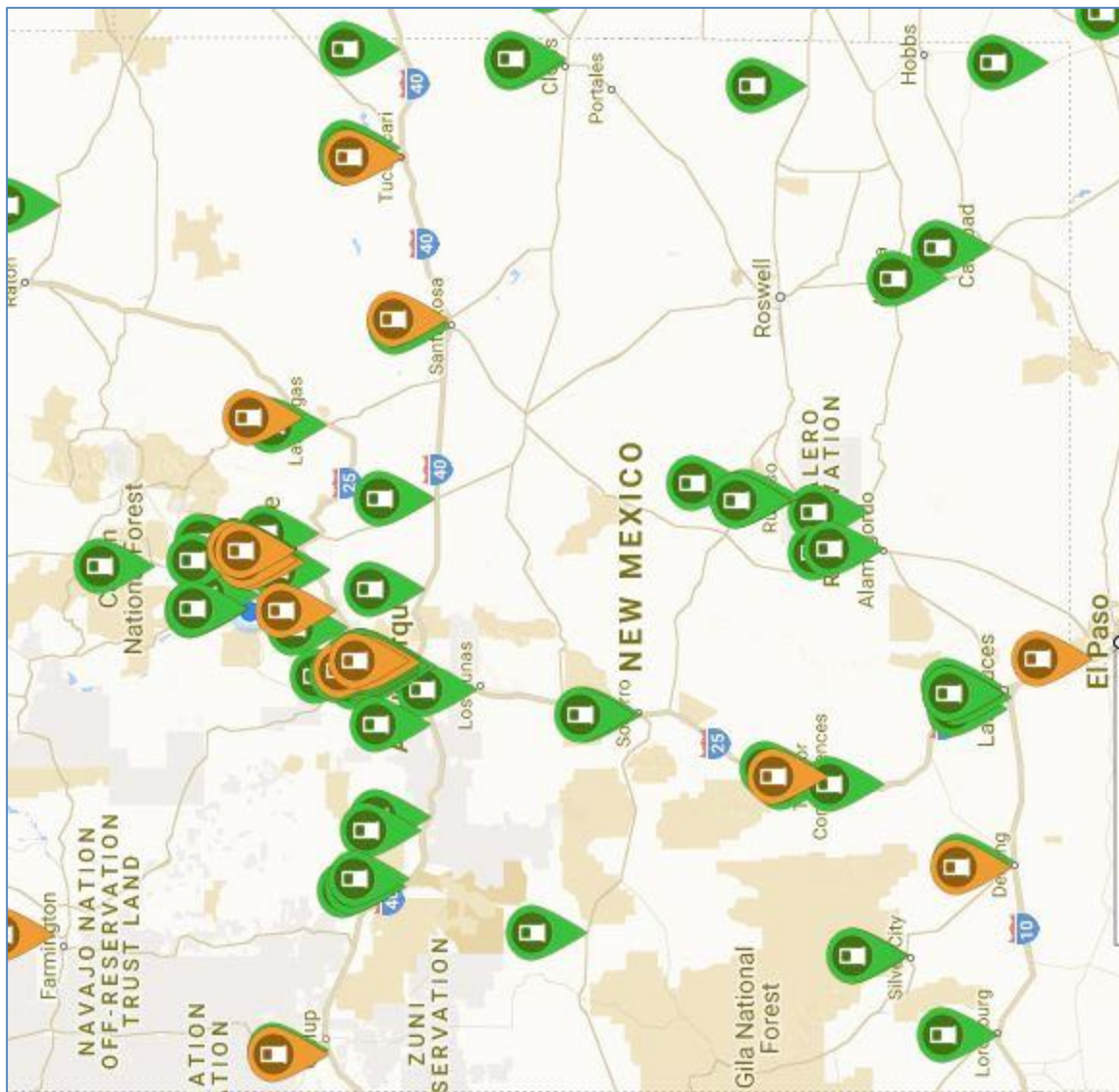
# EV Infrastructure in Los Alamos County

Location	Level	Network	Plug Type	Cost	Plugs
Del Norte Credit Union	2	Non-Networked	J-1772	Free	1
MUNI Building	2	Non-Networked	J-1772	Free	6
Los Alamos Nature Center	2	Non-Networked	J-1772	Free	2
LANL	2	Chargepoint	J-1772	\$.50/hr	N/A



# Stations in NM Cities

City	Total Stations	Networks	Non-Networked
Los Alamos	4	1 Chargepoint	3
Santa Fe	15	1 EVGo 1 Blink 2 ChargePoint	11
Albuquerque	20	3 Greenlots 7 Chargepoint	10



# Potential EV Charging Sites:

## Los Alamos

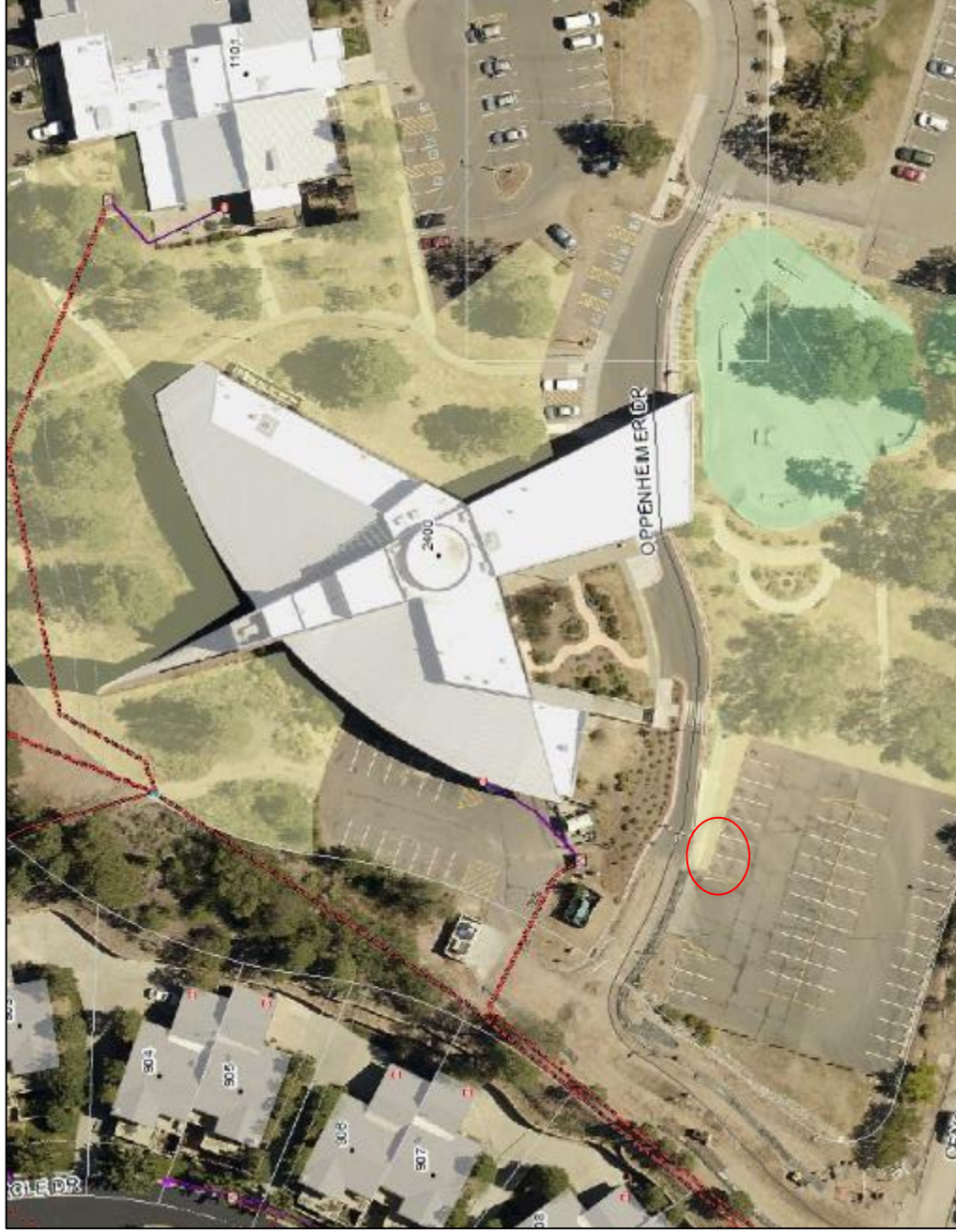
- Pajarito Cliffs Site
  - Use existing MUNI building hardware
  - Charging for electric fleet vehicles
- Mesa Library
  - People stay for long periods of time
  - Park n Ride – Potential Federal Funding
- MUNI Building
  - Replace existing stations with paid stations
  - Adds ability to collect usage data
- Ashley Pond Park
  - Downtown access
  - Tourist area

# Potential EV Charging Sites:

## White Rock

- White Rock Library
  - People stay for long periods of time
  - Local White Rock traffic
- Visitors Center-Bandelier National Park
  - Tourist area
  - People stay for long periods of time

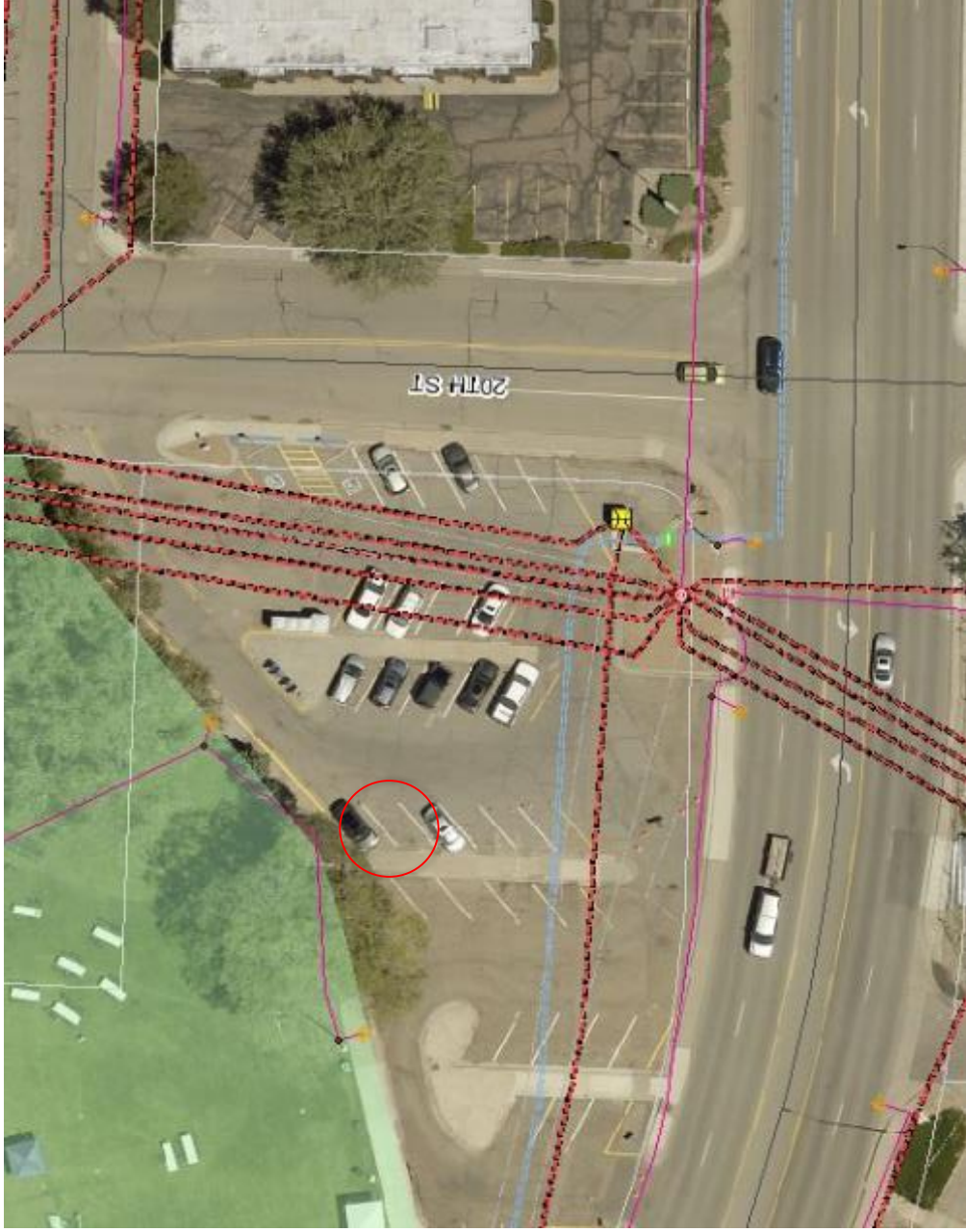
# Mesa Library



# MUNI Building



# Ashley Pond



# Bandelier Visitors Center



# White Rock Library



# Next Steps

- In order to keep up with the auto manufacturers, Los Alamos County needs to provide charging stations to keep up with the rising percentage of EVs
- In order to determine where to best place stations, LAC needs to collect data by placing trial stations and monitoring usage



# County of Los Alamos

## Staff Report

July 18, 2018

Los Alamos, NM 87544  
www.losalamosnm.us

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**Agenda No.:** 8.A  
**Index (Council Goals):**  
**Presenters:** Department of Public Utilities  
**Legislative File:** 11001-18

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### **Title**

Status Reports

### **Body**

Each month the Board receives in the agenda packet informational reports on various items. No presentation is given, but the Board may discuss any of the reports provided.

### **Attachments**

- A - Electric Reliability Report
- B - Accounts Receivables Report
- C - Safety Report

# **STATUS REPORTS**

## **ELECTRIC RELIABILITY**



# Electric Distribution Reliability

July 18, 2018

Stephen Marez  
Senior Engineer

Electric Distribution Reliability Study  
Twelve Month Outage History

Prepared by Stephen Marez  
Senior Engineer L.A.C.U.

Date	Call Rcd.	Circuit	Cause	Start Time	End Time	Duration	Customers Affected (Meters)	Combined Customer Outage Durations	Total Outage H:M:S	Running SAIDI
7/26/2017	Utilities	WR1	URD Failure	6:50	10:30	3:40	10	36:40:00	36:40:00	0:00:15
8/12/2017	Utilities	EA4	OH Failure	14:30	15:00	0:30	5	2:30:00	39:10:00	0:00:16
9/10/2017	Utilities	16	URD Failure	17:00	18:50	1:50	40	73:20:00	112:30:00	0:00:45
9/19/2017	Utilities	14	URD Failure	2:45	3:35	0:50	18	15:00:00	127:30:00	0:00:51
9/19/2017	Utilities	14	URD Failure	7:45	9:00	1:15	80	100:00:00	227:30:00	0:01:31
9/19/2017	Utilities	14	URD Failure	7:45	14:15	6:30	45	292:30:00	520:00:00	0:03:27
10/5/2017	Utilities	15	Tree	16:00	16:15	0:15	10	2:30:00	522:30:00	0:03:28
10/27/2017	Utilities	18	Planned	8:30	9:30	1:00	1	1:00:00	523:30:00	0:03:28
11/24/2017	Dispatch	TC2	Supply line Failure	2:54	6:03	3:09	2264	7131:36:00	7655:06:00	0:50:47
11/24/2017	Dispatch	TC1	System Failure	3:53	5:59	2:06	4069	8544:54:00	16200:00:00	1:47:28
11/30/2017	Utilities	WR1	Planned	19:00	23:00	4:00	1	4:00:00	16204:00:00	1:47:29
11/30/2017	Utilities	WR1	Planned	19:00	0:30	5:30	5	27:30:00	16231:30:00	1:47:40
12/22/2017	Utilities	13	URD Failure	12:30	15:50	3:20	15	50:00:00	16281:30:00	1:48:00
12/27/2017	Utilities	13	URD Failure	18:30	21:07	2:37	1	2:37:00	16284:07:00	1:48:01
1/16/2018	Utilities	18	HUMAN	8:30	8:34	0:04	213	14:12:00	16298:19:00	1:48:07
2/3/2018	Utilities	13	Animal	1:30	2:30	1:00	8	8:00:00	16306:19:00	1:48:10
2/14/2018	Utilities	14	Planned	9:00	10:30	1:30	7	10:30:00	16316:49:00	1:48:14
3/8/2018	Utilities	WR2	Planned	9:30	11:00	1:30	7	10:30:00	16327:19:00	1:48:18
3/9/2018	Utilities	15	Unknown	13:00	14:00	1:00	6	6:00:00	16220:49:00	1:47:36
3/9/2018	Utilities	15	Animal	9:30	10:30	1:00	1	1:00:00	16334:19:00	1:48:21
3/10/2018	Utilities	WR2	Unknown	14:11	15:11	1:00	1	1:00:00	16335:19:00	1:48:22
3/16/2017	Utilities	WR1	Weather	16:30	17:30	1:00	5	5:00:00	16340:19:00	1:48:24
3/18/2017	Utilities	WR1	Weather	14:00	16:00	2:00	1	2:00:00	16342:19:00	1:48:24
3/12/2018	Utilities	13	OH Failure	12:30	15:07	2:37	22	57:34:00	16399:53:00	1:48:47
4/17/2018	Utilities	16	URD Failure	17:00	20:00	3:00	2	6:00:00	16405:53:00	1:48:50
4/26/2018	Utilities	WR1	Planned	9:50	12:20	2:30	7	17:30:00	16423:23:00	1:48:57
5/27/2018	Utilities	16	URD Failure	12:00	13:30	1:30	30	45:00:00	16468:23:00	1:49:15
5/30/2018	Utilities	WR2	Planned	9:05	11:05	2:00	8	16:00:00	16484:23:00	1:49:21
6/3/2018	Utilities	WR2	URD Failure	15:00	16:00	1:00	50	50:00:00	16534:23:00	1:49:41
6/3/2018	Utilities	WR2	URD Failure	15:00	16:45	1:45	27	47:15:00	16581:38:00	1:50:00
6/3/2018	Utilities	WR2	URD Failure	15:00	17:45	2:45	21	57:45:00	16639:23:00	1:50:23
6/12/2018	Utilities	13	URD Failure	20:45	9:30	12:45	15	191:15:00	16830:38:00	1:51:39
6/17/2018	Utilities	16	URD Failure	18:30	20:00	1:30	2	3:00:00	16833:38:00	1:51:40

CIRCUIT SAIDI IS CALCULATED ACCORDING TO THE NUMBER OF CUSTOMERS IN EACH CIRCUIT RESPECTIVELY											
Running SAIDI Circuit	Running SAIDI Circuit 14	Running SAIDI Circuit 15	Running SAIDI Circuit 16	Running SAIDI Circuit 17	Running SAIDI Circuit 18	SAIDI Circuit EA4 & Royal Crest	Running SAIDI Circuit WR1	Running SAIDI Circuit WR2	Monthly SAIDI	Monthly Customer Minutes out of service	WEATHER SAIDI
13							0:01:23		JULY	36:40:00	
			0:02:23			0:00:05			AUGUST	2:30:00	
	0:01:40										
	0:12:48										
	0:45:22								SEPTEMBER	480:50:00	
		0:00:05							OCTOBER	396:00:00	
4:18:33	13:59:14	3:48:47	4:38:20	40:53:05	0:00:17						
					40:07:18		0:01:32				
							0:02:35		NOVEMBER	15708:00:00	
4:20:22									DECEMBER	84:07:00	
4:20:27					0:04:00				JANUARY	94:19:00	
4:20:45									FEBRUARY	35:19:00	
	14:00:24							0:00:39			
		3:48:58									
		3:49:00						0:00:43			
							0:02:46				
4:22:50							0:02:51		MARCH	25:30:00	0:00:03
			4:38:32								
							0:03:30		APRIL	81:04:00	
			4:40:00						MAY	61:00:00	
								0:01:43			
								0:04:50			
								0:07:47			
								0:11:24			
4:29:46											
			4:40:06						JUNE	349:15:00	
Circ 13	Circ 14	Circ 15	Circ 16	Circ 17	Circ 18	Circ EA4	Circ WR1	Circ WR2	Total		0:00:03
1655	539	1875	1842	209	213	165	1586	961	9045		

Twelve Month History	June 2018	
Total # Accounts	9045	
Total # Interruptions	33	
Sum Customer Interruption Durations	16833:38:00	hours:min:sec
# Customers Interrupted	6997	
SAIFI( APPA AVG. = 1.0)	.77	int./cust.
SAIDI ( APPA AVG. = 1:00)	1:51	hours:min
CAIDI	2:24	hours:min/INT
ASAI	99.9991%	% available

- **SAIFI - System Average Interruption Frequency Index**

A measure of interruptions per customer (Per Year)

$$\text{SAIFI} = \frac{(\text{Total number of customer interruptions})}{(\text{Total number of customers served})}$$

- **SAIDI – System Average Interruption Duration Index**

A measure of outage time per customer if all customers were out at the same time (hours per year)

$$\text{SAIDI} = \frac{(\text{Sum of all customer outage durations})}{(\text{Total number of customers served})}$$

- **CAIDI – Customer Average Interruption Duration Index**

A measure of the average outage duration per customer (hours per interruption)

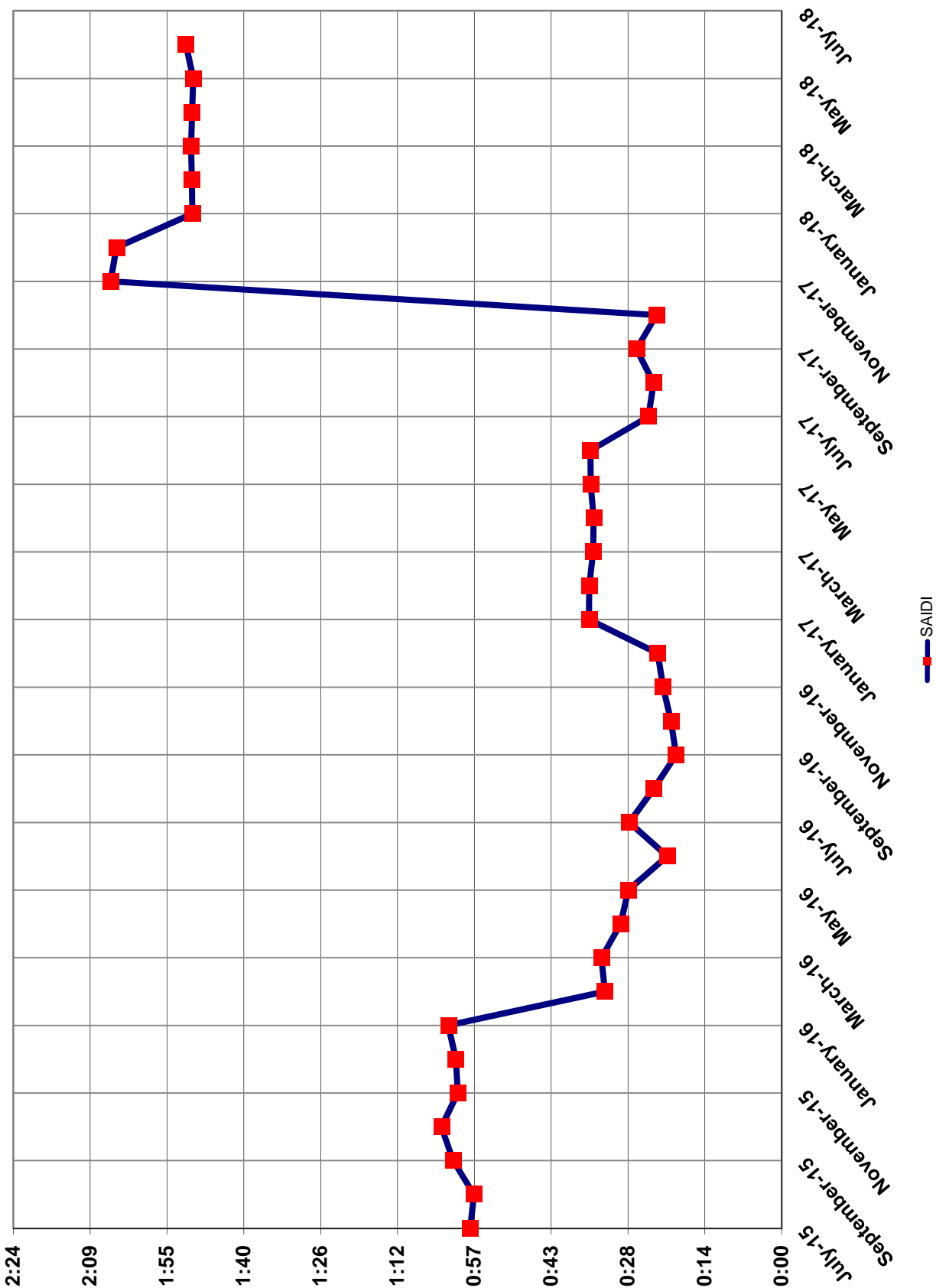
$$\text{CAIDI} = \frac{(\text{Sum of all customer outage durations})}{(\text{Total number of customer interruptions})} = \frac{\text{SAIDI}}{\text{SAIFI}}$$

- **ASAI – Average System Availability Index**

A measure of the average service availability (Per unit)

$$\text{ASAI} = \frac{(\text{Service hours available})}{(\text{Customer demand hours})} = \frac{8760 - \text{SAIDI}}{8760}$$

EACH POINT IS A 12 MONTH SAIDI HISTORY  
1:00:00 = APPA BENCHMARK SAIDI



# **STATUS REPORTS**

## **ACCOUNTS RECEIVABLES**

Los Alamos County Utilities Department  
Active Receivables Over 90 Days Past Due  
June 28, 2018

<i>Account</i>	<i>Acct Type</i>	<i>Comments</i>	<i>90 - 119</i>	<i>120 +</i>
2021698	COMM	No payment made since 7/1	107.18	-
2007777	RES	Payment of \$633.04 on 7/6	156.42	-
2097818	RES	Balance from 2015, new bill issued on 6/24	-	118.98
2012293	RES	Balance from 2015, new bill issued on 6/19	-	216.10
2002399	COMM	No payment made since 7/1	-	1,050.00
			263.60	1,385.08
			<b>TOTAL \$</b>	<b>1,648.68</b>

Los Alamos County Utilities Department  
Receivables More than 60 Days Inactive  
June 28, 2018

<i>YEAR</i>	<i>OUTSTANDING 6/28</i>	<i># OF ACCOUNTS</i>	<i>OUTSTANDING 6/1</i>	<i># OF ACCOUNTS</i>
FY14	27,827.34	86	28,080.82	89
FY15	23,300.97	83	25,397.27	86
FY16	18,699.63	75	20,890.23	81
FY17	27,787.48	71	27,823.57	71
FY18	18,279.89	79	9,672.23	55
<b>TOTAL</b>	<b>\$ 115,895.31</b>	<b>394</b>	<b>\$ 111,864.12</b>	<b>382</b>

# STATUS REPORTS

## SAFETY

DATE	TYPE	DEPT	EE #	PROP	CAUSE
06/15/18	PD	ELDIST	8462	1263	Stone flew up; broke windshield
06/27/18	PD	PARKS	7540	1058	EE found veh backed into while parked

DOI	REPT DT	TYPE	DESC
		PD	Property Damage
		BI	Bodily Injury
		PI	Personal Injury
06/19/18	06/20/18	PD	Cmnt alleges sewer b-u from Co. clog

	Hours Worked						Hours Worked					
	ADMIN	EL DIST	EL PROD	GWS	WA PROD	WWTP	ADMIN	EL DIST	EL PROD	GWS	WA PROD	WWTP
<b>MONTH</b>												
Jan - 2018	2773.0	1161.0	1572.0	2972.0	1014.0	976.0						
Feb - 2018	3339.0	1437.0	3114.0	3482.0	1235.0	1239.0						
Mar - 2018	4766.0	1531.0	2612.0	4201.0	1687.0	1788.0						
Apr - 2018	3229.0	1323.0	1682.0	3225.0	1165.0	1344.0						
May - 2018	3980.0	1279.0	1814.0	3331.0	1284.0	1093.0						
June - 2018	3523.0	1292.0	1586.0	3754.0	1155.0	1168.0						
July - 2017	4071.0	1462.0	1558.0	3732.0	1453.0	1345.0						
Aug - 2017	5757.0	1641.0	2680.0	4286.0	2895.0	3097.0						
Sept - 2017	3385.0	1329.0	1659.0	3439.0	1355.0	1122.0						
Oct - 2017	3029.0	1424.0	1468.0	3522.0	1188.0	1238.0						
Nov - 2017	3476.0	1416.0	1506.0	3398.0	1182.0	1201.0						
Dec - 2017	3204.0	1251.0	1372.0	3047.0	2427.0	946.0						
<b>Total Hrs Worked -&gt;</b>	44532.0	16546.0	22623.0	42389.0	18040.0	16557.0						
<b>Number of Recordable Injury and Illness Cases</b>	0	1	0	3	0	1						
<b>OSHA Recordable Injury &amp; Illness Incidence Rate</b>	0.00	12.09	0.00	14.15	0.00	12.08						
<b>Number of OSHA Days Away Days Restricted (DART) cases</b>	0	0	0	3	0	0						
<b>OSHA Days Away Days Restricted (DART) Rate</b>	0.00	0.00	0.00	14.15	0.00	0.00						