

Advanced Metering Infrastructure Pilot Studies Update

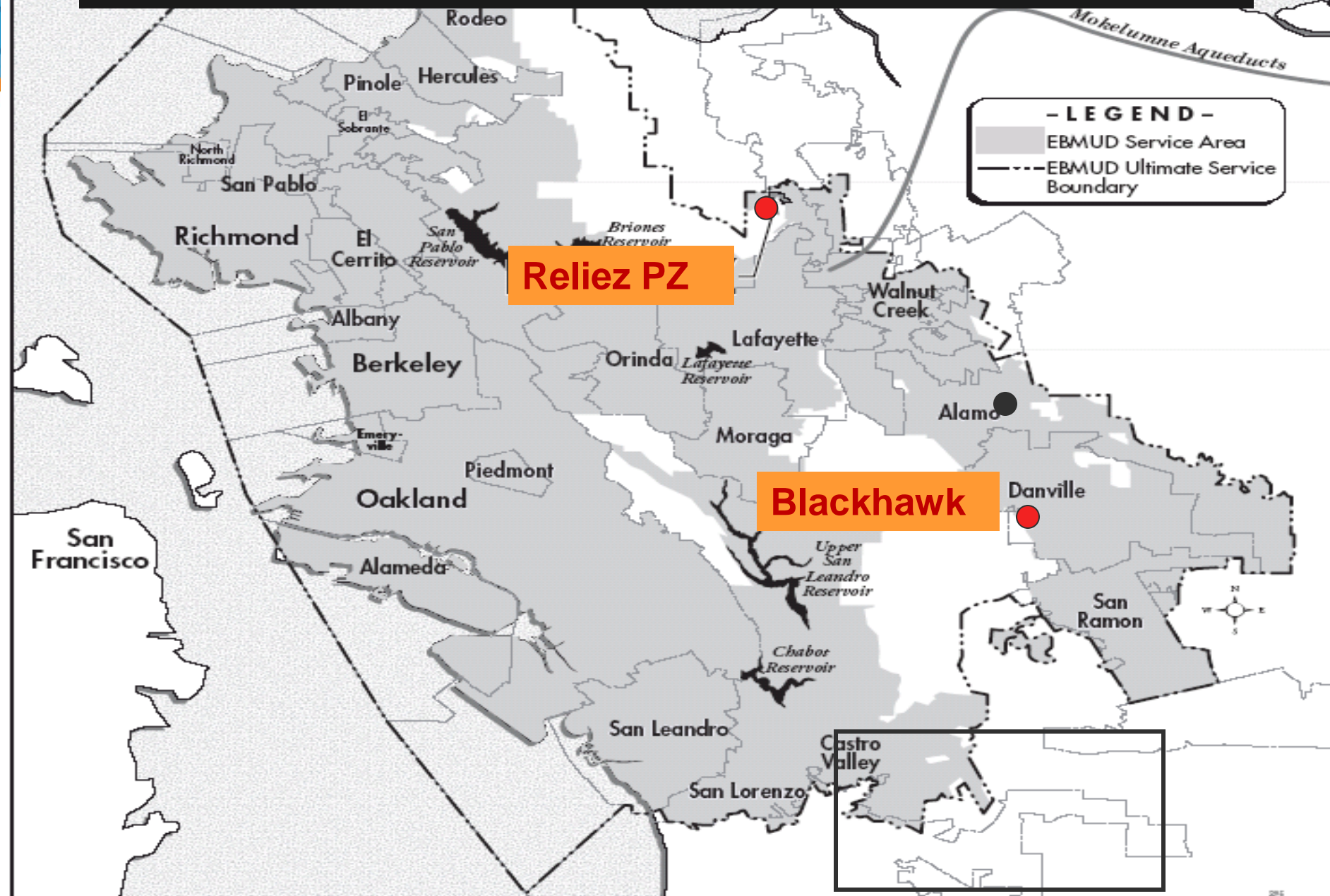


Finance Committee
July 23, 2013

Definition (Adapted from Wikipedia)

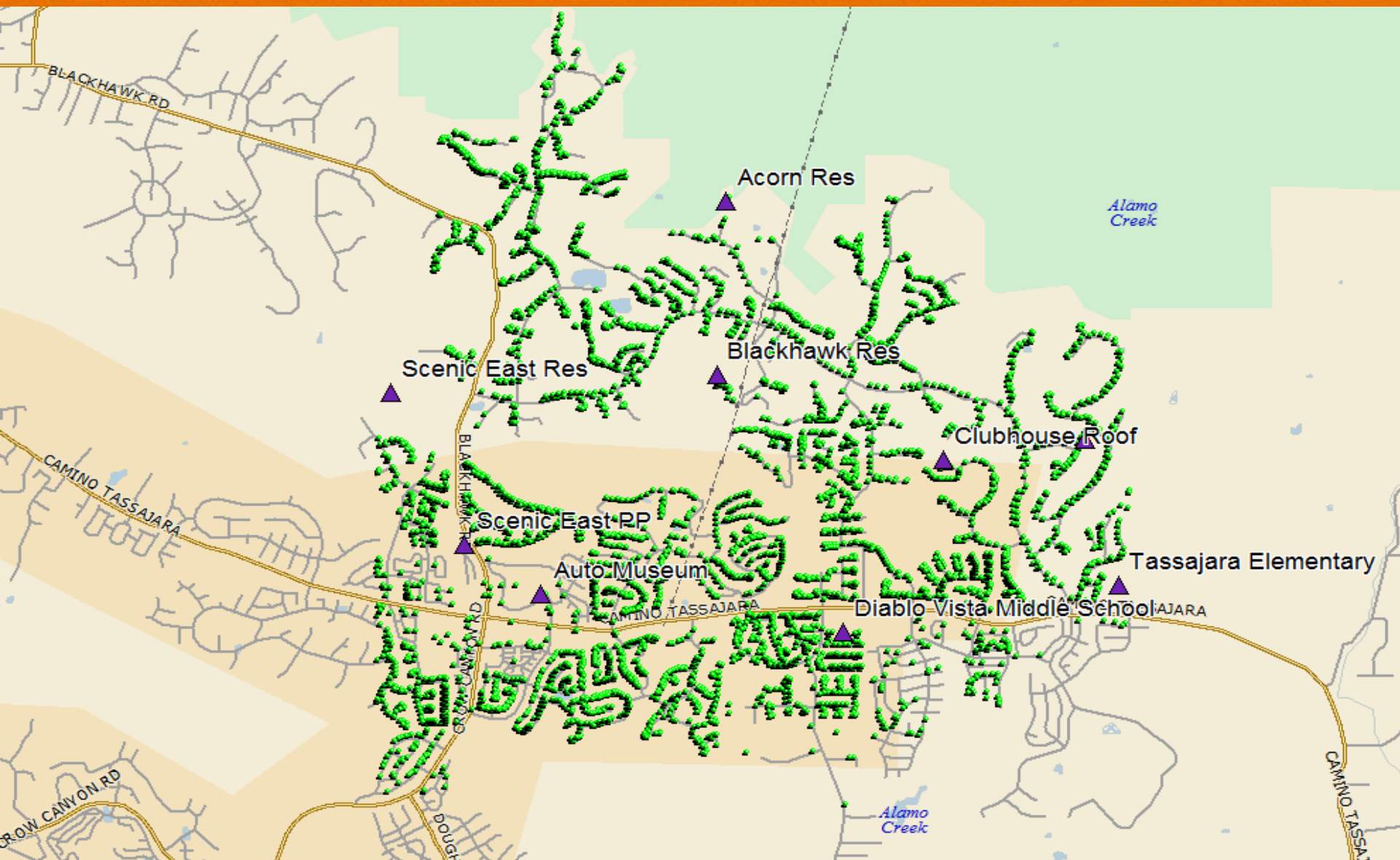
- *Advanced Metering Infrastructure (AMI)* measures, collects and analyzes water use; and communicates with metering devices such as water meters, electric meters, pressure sensors and other instrumentation.
- AMI systems include hardware, software, communications, consumer water displays, and meter data management (MDM) software and systems.

AMI (FIXED NETWORK) STUDY AREAS



Blackhawk AMI Project Area

EBMUD 1923
2013



Reliez Pressure Zone Pilot Area

EBMUD 1923
2013



Pilot Study Timelines



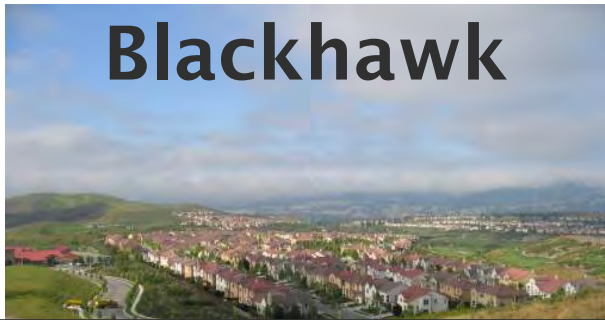
Timeline	Blackhawk	Reliez
Initiated	2008	2006
Construction Completed	2009	2007
Beta-testing Phase 1	2010	2008
Equipment Redeployment	2011	2013
Automated Reading/Billing	Oct. 2011	NA
Beta-testing Phase 2	2013	2013
Scheduled Launch	Aug. '13	Sept. '13
Service Contract	2018	2015

Pilot Study Features



Project Features

Blackhawk



Reliez



Project Size

Approx. 10 sq. mi.

One Pressure Zone (PZ)

No. of Meters

~4,000 (5/8- to 6-inch)
(85% resid.)

78 (1.5-inch) (100% resid.)

Avg. Summer Demand

>1,000 gpd/acct

>1,000 gpd/acct

No. of Collectors

9

1

Vendor(s)

Triton (software)
Aclara (hardware)
\$775,000 contract

Mueller (software)
Metron-Farnier (hardware)
\$8,600 contract

Frequency of Reads

Hourly

Hourly

Web-Interface

Yes

Yes

AMI Website Features

Website Features

Blackhawk



Reliez



Historical Use

Previous 10-years

NA

Water Use Data

Yearly, monthly, daily, hourly

Data Units

Billing units, cubic feet, gallons, dollars

Customized Alerts

Potential leaks, daily water budget

Notifications

Email, telephone, postcards

Customer Reports

Graphical and Excel

Admin. Reports

Aggregate consumption, leakage, demand profiles

Blackhawk: WaterSmart Toolbox- Customer Annual Use

EBMUD 1923
2013

Welcome to WaterSmart Toolbox!



WATER USAGE

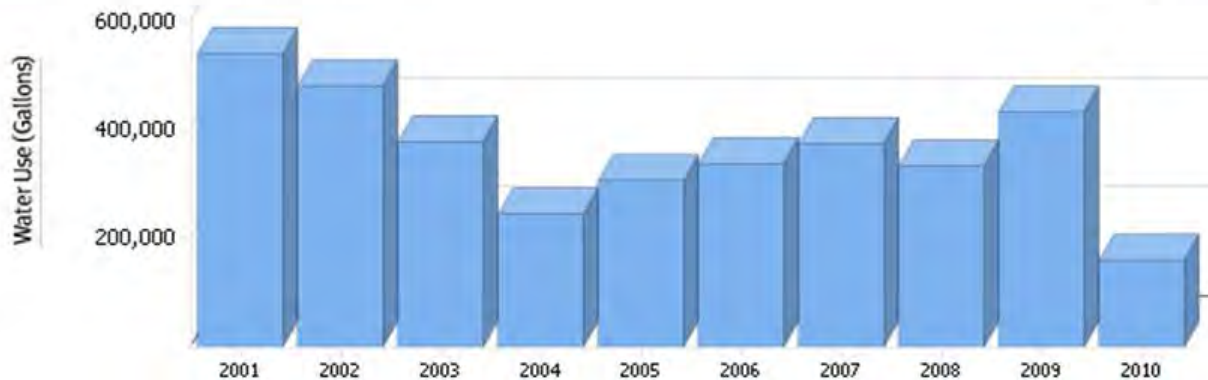
SETTINGS

Account
#34739632

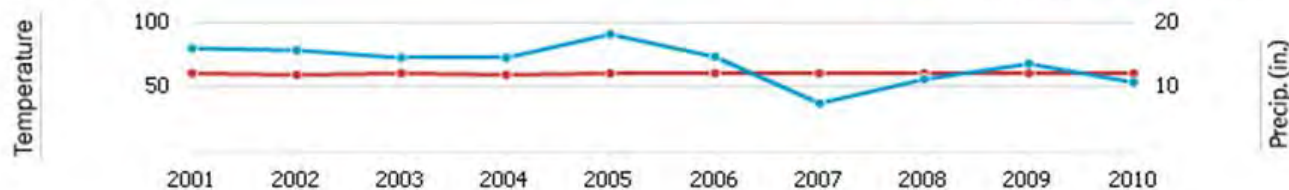
[Sign Out](#)

Yearly Water Usage

Last 10 years



Climate



Quick View

Yearly Monthly Daily Hourly

[Table View](#)

Climate

- ☒ Temperature ?
- ☒ Precipitation ?

Settings

[Edit](#)

Chart Units: **Gallons**

Daily Limit: **ON**

Alert sent at 2000 Gallons

Leak Detection: **ON**

Threshold set at 0 Gallons

Download Report ?

Water Use:

DOWNLOAD

Blackhawk: WaterSmart Toolbox- Customer Monthly Use

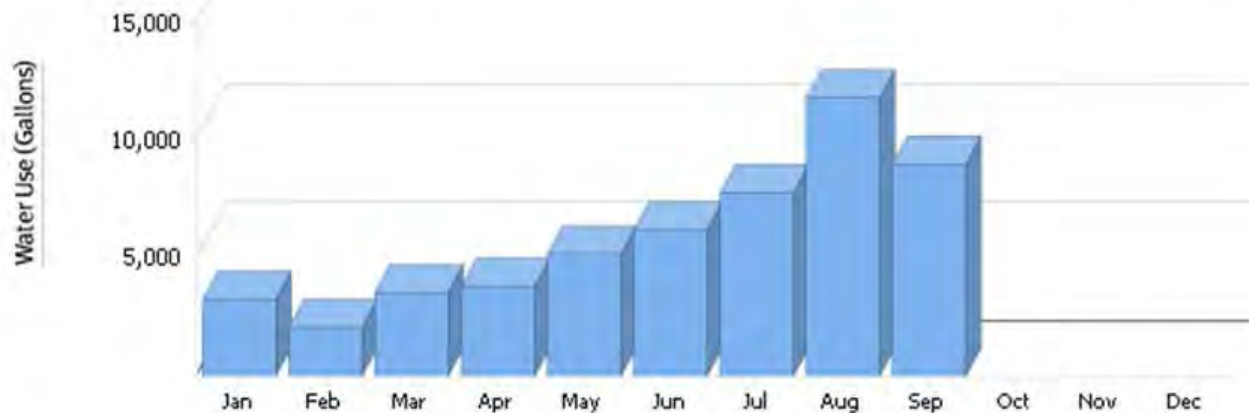
EBMUD 1923
2013

User Lookup

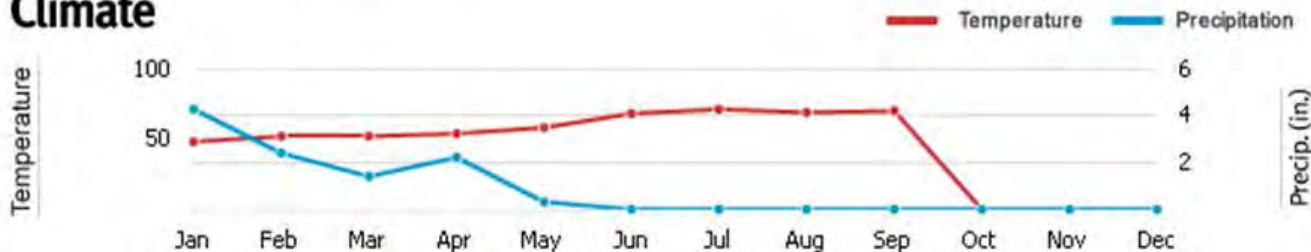
Account #123451

Monthly Water Usage

Monthly usage for 2010



Climate



Quick View

[Yearly](#) **Monthly** [Daily](#) [Hourly](#)

[Table View](#)

Climate

- ☒ Temperature [?](#)
- ☒ Precipitation [?](#)

Settings

[Edit](#)

Daily Limit: **ON**

Alert sent at 100 Gallons

Leak Detection: **ON**

Threshold set at 5 Gallons

Download Report [?](#)

[?](#) Enter timeframe [?](#)

Water Use:

Choose ...

DOWNLOAD

Blackhawk: WaterSmart Toolbox- Customer Daily Use

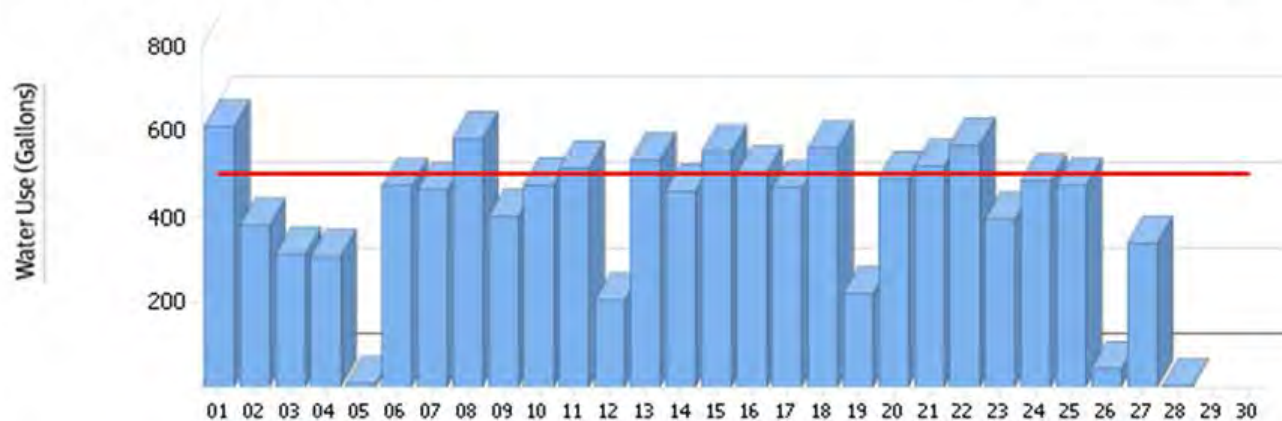
EBMUD 1923
2013

User Lookup

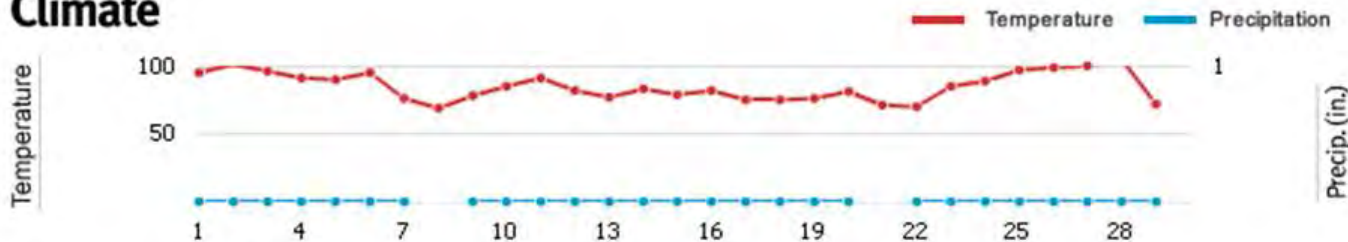
Account #123452

Daily Water Usage

Daily usage for September 2010



Climate



Quick View

Yearly Monthly Daily Hourly

[Table View](#)

Climate

☒ Temperature ?

☒ Precipitation ?

Settings

[Edit](#)

Daily Limit: **ON**

Alert sent at 500 Gallons

Leak Detection: **ON**

Threshold set at 10 Gallons

Download Report ?

Enter timeframe

Water Use:

Choose ...

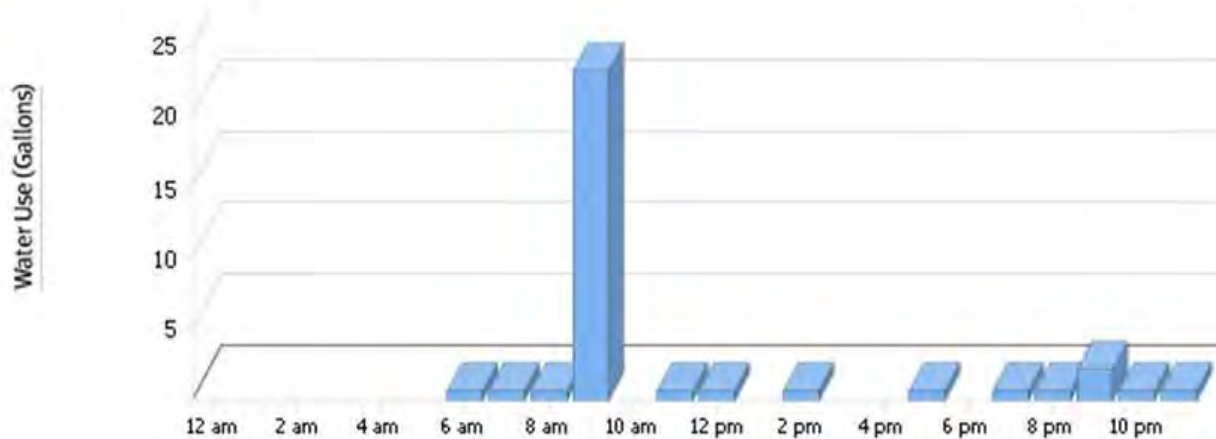
DOWNLOAD

Blackhawk: WaterSmart Toolbox- Customer Customer Hourly Use

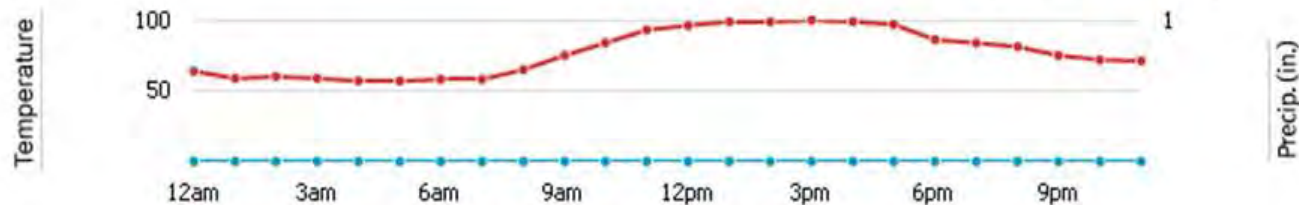
EBMUD 1923
2013

Hourly Water Usage

Hourly usage for 2010-09-27



Climate



Quick View

Yearly Monthly Daily **Hourly**

[Table View](#)

Climate

- ☒ Temperature ?
- ☒ Precipitation ?

Settings

[Edit](#)

Chart Units: **Gallons**

Daily Limit: **ON**

Alert sent at 500 Gallons

Leak Detection: **ON**

Threshold set at 10 Gallons

Download Report ?

Water Use:

DOWNLOAD

Blackhawk: WaterSmart Toolbox-Admin Site



SIMON SAVES

Welcome, admin | [Logout](#)

Admin Controls

MANAGE ADMINS

USER LOOKUP

REPORTS

SYSTEM MESSAGES

Home



[Manage Admins](#)

Create and modify up to thirty site administrators.



[User Lookup](#)

Search for a user and view and modify their account.



[Reports](#)

View Water Usage, Leak Detection and System Access.



[System Messages](#)

Broadcast a system-wide message to all user accounts.

Welcome to your Admin Home.

Use the selections to the left to add more admins, look up users, pull reports or broadcast messages across the system.

Blackhawk: Aggregate Consumption Reports (2009)

EBMUD 1923
2013

SIMON SAVES

Welcome, admin | [Logout](#)

[Admin Controls](#)

[MANAGE ADMINS](#)

[USER LOOKUP](#)

[REPORTS](#)

[SYSTEM MESSAGES](#)

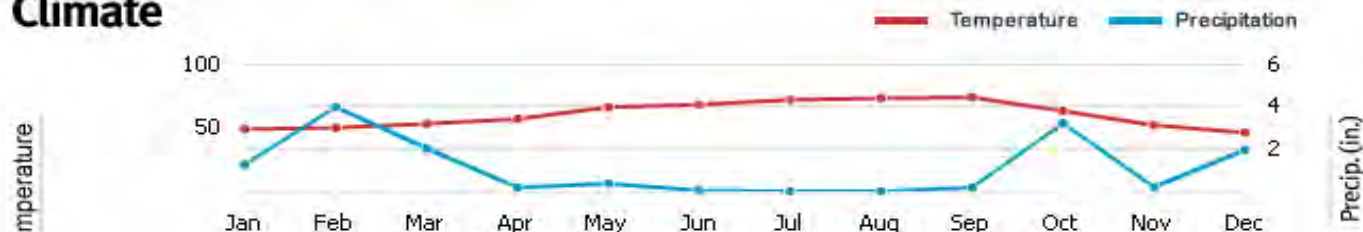
Reports Water Usage

Monthly Water Usage

Jan - Dec 2009



Climate



Quick View

[Yearly](#) [Monthly](#) [Daily](#) [Hourly](#)

Meter Read Report

- ☐ Monthly Reads
☐ Daily Reads
☐ Hourly Reads

Select Month: 2009

[DOWNLOAD](#)

Consumption Report

Enter timeframe

Filter: Usage is greater than

Gallons

[DOWNLOAD](#)

Blackhawk: Aggregate Hourly Consumption Profile

EBMUD 1923
2013

SIMON SAVES

Welcome admin | Logout

Admin Controls

MANAGE ADMINS

USER LOOKUP

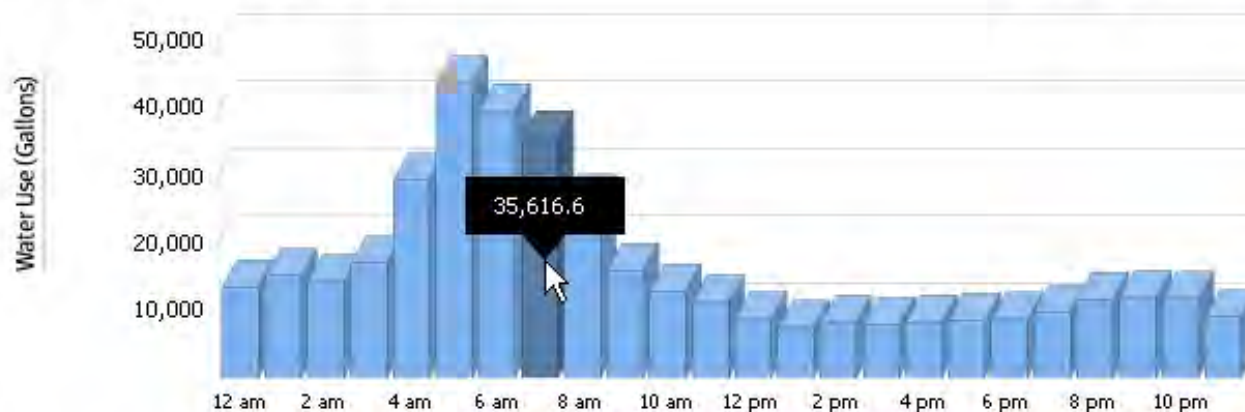
REPORTS

SYSTEM MESSAGES

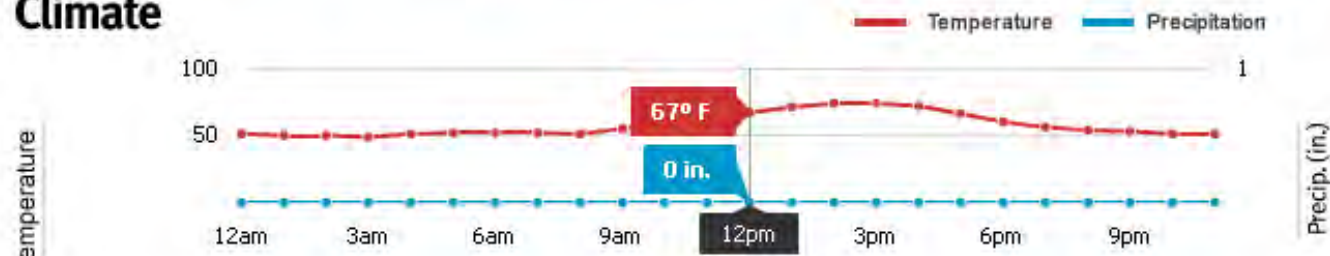
Reports Water Usage

Hourly Water Usage

Hourly usage for 10/10/2009



Climate



Quick View

Yearly Monthly Daily **Hourly**

Meter Read Report

☐ Monthly Reads

☐ Daily Reads

☐ Hourly Reads

Select Month 2009

DOWNLOAD

Consumption Report

Enter timeframe

Filter: Usage is greater than

Gallons

DOWNLOAD

Blackhawk: Suspected Leak Reports



Admin Controls

MANAGE ADMINS

USER LOOKUP

REPORTS

SYSTEM MESSAGES

Reports > Leak Detection

Active Leaks

Account	Last Detection	# of Days	Controls
	September 29, 2010, 9:00 am	197	Reset
	September 29, 2010, 9:00 am	105	Reset
	September 29, 2010, 9:00 am	100	Reset
	September 29, 2010, 9:00 am	65	Reset
	September 29, 2010, 9:00 am	48	Reset
	September 29, 2010, 9:00 am	43	Reset
	September 29, 2010, 9:00 am	42	Reset
	September 29, 2010, 9:00 am	42	Reset
	September 29, 2010, 9:00 am	42	Reset
	September 29, 2010, 9:00 am	42	Reset

Account #s
hidden

Download Report

Download all detected leaks:

DOWNLOAD

Blackhawk: Automated Reading and Billing Statistics



- >35,000 billing reads October 2011- June 2013
- >18 million hourly reads that customer have access to for 2013
- >100 million hours of consumption data available to conservation staff since 2009

Blackhawk: Customer Issues Resolved



- 💧 Repair of significant leaks identified by AMI
- 💧 Identified over watering with personal gardener
- 💧 Identified how much water was being used by HOA ball field to divide bill
- 💧 High bill complaint resolutions:
 - new customer-watering every day
 - same usage for 10 years, never realized it
 - customer irrigating in winter



WaterSmart Toolbox Pilot Project

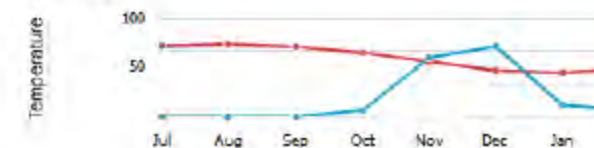
YOUR home has been selected to be part of EBMUD's new WaterSmart Toolbox pilot project. This project involves the use of metering technology which will give you access to monthly, daily, even hourly data on your water use, which you can view remotely using a computer or handheld device. The aim is to help you save water and money.

Working with EBMUD staff, this initiative will help you identify leaks and develop effective water conservation strategies. These strategies may include installation of water efficient devices, plumbing fixtures, and appliances, as well as

Monthly Water Usage



Climate



AMR/AMI Pilot Study Findings

- 💧 A surprising number of leaks
- 💧 Over irrigation common
- 💧 Flow rates exceeding meter warranty
- 💧 Meter inaccuracy and revenue loss
- 💧 Favorable website customer feedback
- 💧 5-20% reduction in use
- 💧 Technology still being improved



AMI Further Evaluation



- Refined water budgets and benchmark use based on indoor use and evapotranspiration
- Data mining tools to evaluate savings achieved from AMI and other conservation programs
- Fixed network leak detection system integration
- Additional research on weather-based controllers
- Water distribution system optimization review and full AMI implementation study
- Select AMI deployments within WC Master Plan

Reliez Website: Customer Daily Use

[Home](#)[Water](#)[Network Infrastructure](#)[Account Management](#)[Alerts](#)[Tools](#)[Billing](#)[Home](#) » [Water](#) » Meter Details[Generate Report](#)[On Demand Read](#)[Meter List](#)[Config Logging & Threshold](#)

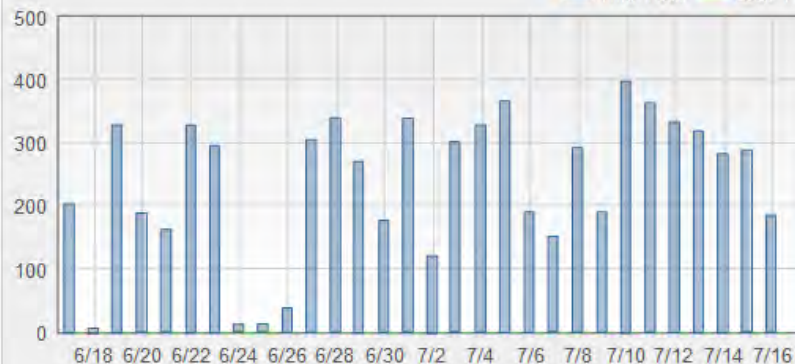
Consumption Graph

[Day](#) | [Month](#) | [Year](#)

DAILY CONSUMPTION

6/17/2013 – 7/16/2013

■ This Year ■ Last Year



Reading

Current Status: OK
Last Reading (CF): 21276.6
Read On: 7/17/2013 12:00:00 AM
Flow Rate (CF /day): 198

Billing Information

[Change](#)

Account ID: 5030344
Customer Name: Cara Helburg
Street: 24 Jennifer Highlands Ct
City: Lafayette
State: CA
Zip: 94549
Billing Cycle: Cycle 1
Billing Rate: TC - Commercial Time
Last Billed Read: N/A
Last Billed Total Consumption: CF
Bill Breakdown:
Individual Total: 0 CF

[Download TOU](#)[Billing History](#)

Service Location

[Change](#)

SocketID: 5030344
Street: 24 Jennifer Highlands Ct
City: Lafayette
State: CA
ZIP: 94549

Meter Information

[Change](#)

Reliez Website: Customer Hourly Data

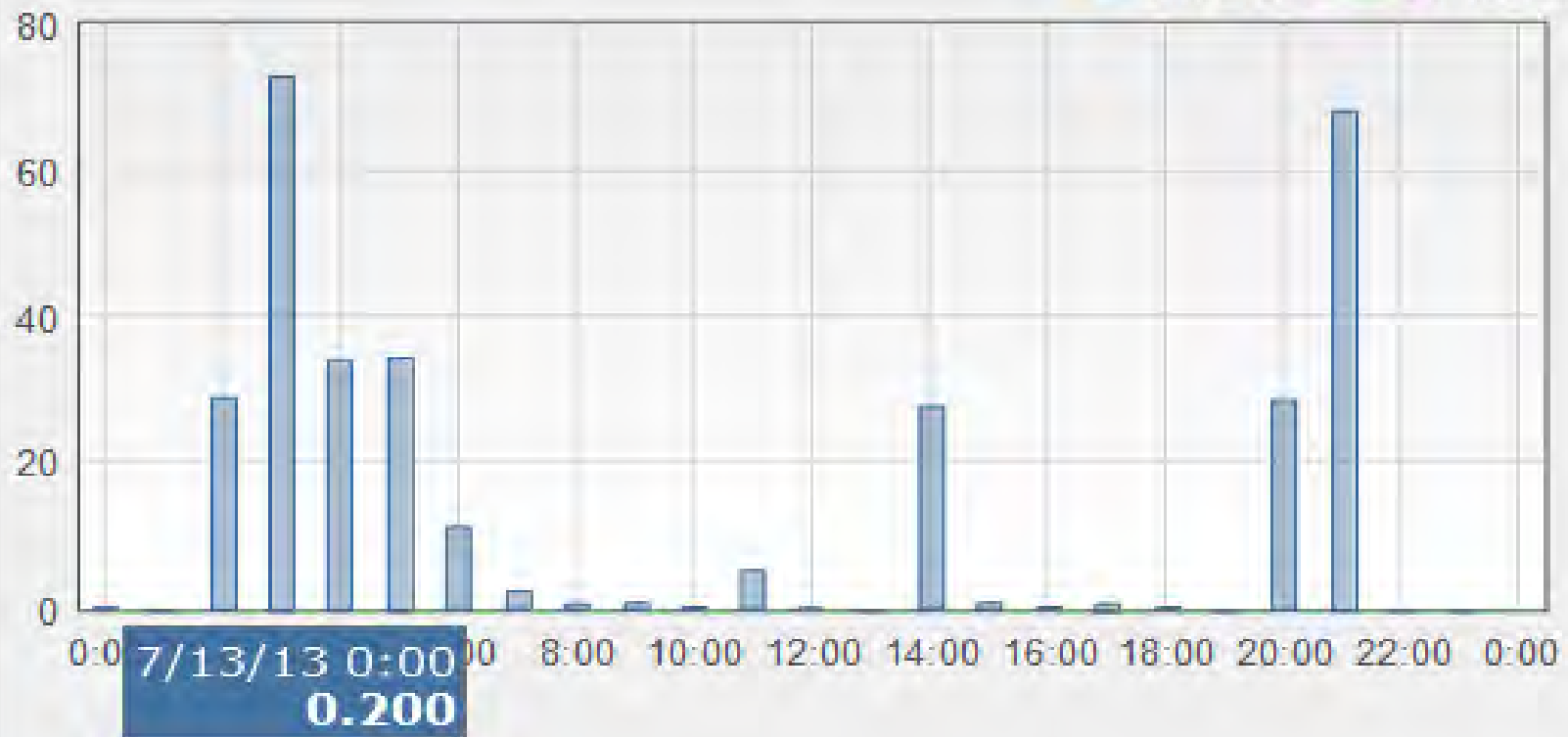
Consumption Graph

[Day](#) | [Month](#) | [Year](#)

HOURLY CONSUMPTION

← 7/13/2013 – 7/13/2013 →

■ This Year ■ Last Year





EAST BAY MUNICIPAL UTILITY DISTRICT

Power and Water Resources Pooling Authority (PWRPA)

Finance Committee

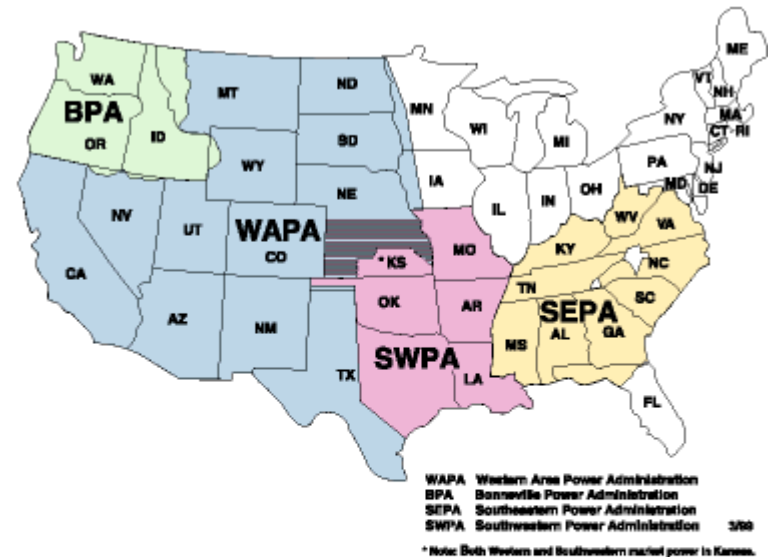
July 23, 2013

Overview

- WAPA and PWRPA Overview
- Benefits and Cost Savings
- Schedule
- Recommendation

Western Area Power Administration (WAPA)

- One of four power marketing administrations within the U.S.
Department of Energy
- Wholesale power provider
- Role is to market and transmit electricity from multi-use water projects
- 10,505 MW installed capacity
- Sold 42.4 billion kWh in FY2011



District WAPA History



- District has allocation for WAPA power because it is
 - A preference entity eligible to receive federal power
 - Serves a large residential sector
 - A CVP water customer
- District began WAPA service in 1982 at the Main Wastewater Treatment Plant

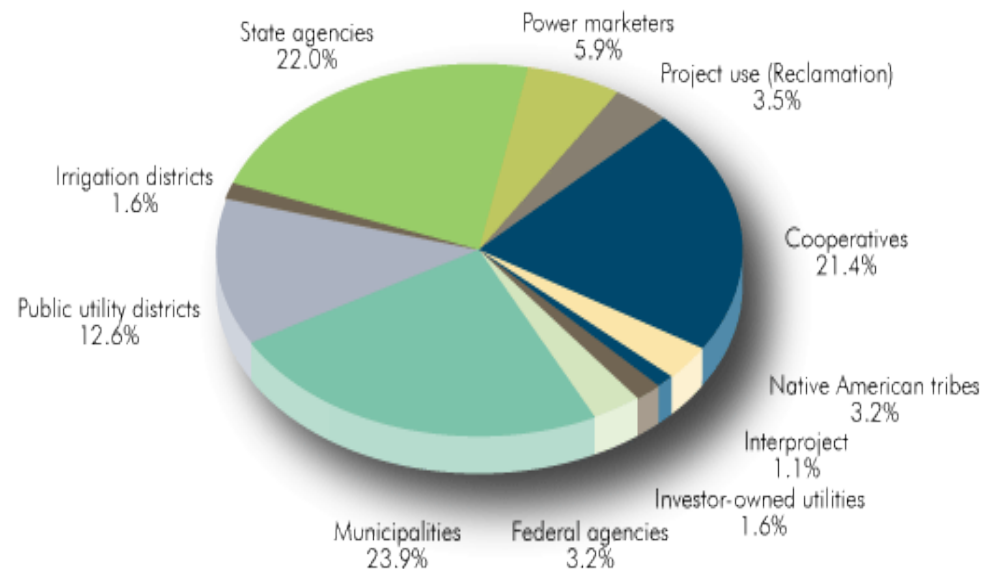
- **Base Resource**

- Low cost Federal hydropower
- Allocation: 0.115%
- FY2013 District purchased 3.76 GWh (4% of total energy purchased)

- **Custom Product**

- Market price mixed power
- FY2013 District purchased 6.94 GWh (8% of total energy purchased)

WHERE OUR ENERGY GOES (MWh)



WAPA Limitations



- PG&E imposed limitations because of wholesale distribution tariff
 - Minimum Load: 500 KW
 - Minimum Service Voltage: 2,000 volts
 - Location outside a city boundary (unincorporated areas)
- Maximizing WAPA service
 - WAPA service at four District facilities and in the process of adding two more facilities

Power and Water Resources Pooling Authority (PWRPA)



- Publicly-owned electric utility
- Joint powers authority established in 2004
- Participants
 - 8 Irrigation Districts
 - 7 Water Districts
- PWRPA members use 290,000 to 520,000 MWh annually
- PWRPA supplied 422,775 MWh in 2012

PWRPA Participants



Banta-Carbona ID	Arvin-Edison Water Storage District
Glen-Colusa ID	Cawelo Water District
James ID	Reclamation District 108
Lower Tule River ID	Santa Clara Valley Water District
Princeton-Codora-Glen ID	Sonoma County Water Agency
Provident ID	Westlands Water District
West Side ID	Zone 7*
West Stanislaus ID	

* Zone 7 is a conditional stakeholder pending 2015 WAPA allocation

How PWRPA Works



- Pools participant's WAPA Base Resource
 - Use our base resource first
 - Access to other participant's unused base resource
 - Annual load between 20 MW to 120 MW (winter vs summer load)
 - WAPA Base Resource allocation is 60 MW
- Supplemental power (similar to WAPA Custom Product)

Difference Between WAPA and PWRPA



- PG&E imposed limitations because of wholesale distribution tariff
 - WAPA
 - Load, voltage and location
 - PWRPA
 - No limitation on load, voltage, and location
 - Limited to water and wastewater accounts
- PWRPA must meet RPS requirements

PWRPA Membership and Eligibility Requirements



- Current contract holder of WAPA Power
- Construct and maintain intervening facilities

PWRPA Intervening Facility



- Generally includes high voltage metering equipment and disconnecting devices between District facility and PG&E
- Examples include pole and underground vault, disconnect switch, protection device, primary metering, PWRPA revenue meter and communication equipment

PWRPA Benefits



- Lower cost
 - 9 to 23 percent lower cost than PG&E service
 - Unused Base Resource can be reassigned
- Can enter into exclusive power agreements (e.g., purchase greener energy)
- Potential mechanism for self service
- Full use of Public Purpose Charge
 - District currently pays 9% of bill for public purpose programs
 - PWRPA has a 3% charge
- Operational flexibility

District Facilities Considered for PWRPA



- District has over 500 water and wastewater accounts
- Significant up front costs and resource needs
 - Significant staff time for contract negotiations, planning, design and construction
 - Cost estimate: \$200,000 - \$300,000 for intervening facilities
- Facilities considered for PWRPA
 - Larger electric accounts
 - Facilities undergoing electrical upgrades

PWRPA Savings

Site	Annual Use	# of Acct	PG&E Annual Cost	Est. PWRPA Annual Cost	Est. Annual Savings	
					\$	%
WTP (OR, Laf, USL)	12,000 MWh	3	\$1,495K	\$1,152K	\$343K	23%
Distribution PPs	12,600 MWh	3	\$1,564K	\$1,210K	\$354K	23%
Raw Water pp	2,500 MWh	2	\$286K	\$240K	\$ 46K	16%
Wastewater	3,122 MWh	1	\$350K	\$300K	\$ 50K	14%
Camanche pp	26,000 MWh	1	\$2,755K	\$2,495K	\$260K	9%
Annual Total	56,222 MWh	10	\$6,450K	\$5,397K	\$1,053K	16%

PWRPA Agreements



- PWRPA
 - Joint Powers Authority
 - Aggregation Services Agreement
 - Distribution Facilities Agreement
 - Cost Agreement
 - Electric Service Agreement
- WAPA
 - Base Resource Allocation Agreement

Schedule



Task	Schedule
Finance Committee gives go ahead for PWRPA	July 23, 2013
PWRPA Agreements	October 2013
WAPA Agreement	November 2013
Introduce EBMUD membership to PWRPA Board	November 6, 2013
PWRPA Board to vote on EBMUD membership	December 11, 2014
EBMUD Board to approve WAPA and PWRPA Agreements	January 14, 2013
Negotiate Intervening Facility requirement with PG&E	TBD
Plan, Design & Construct Intervening Facility	2014 to 2015
Begin first Service	2015

Recommendation



- Join PWRPA JPA to expand availability of WAPA power to the District's water and wastewater facilities