Energy Research and Development Division
FINAL PROJECT REPORT

MODESTO IRRIGATION DISTRICT SMART METER AND CUSTOMER INTERFACE PROJECT

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Prepared by: Modesto Irrigation District

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PREFACE

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The Energy Research and Development Division conducts public interest research, development, and demonstration (RD&D) projects to benefit California.

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- Energy Systems Integration
- Environmentally Preferred Advanced Generation
- Industrial/Agricultural/Water End-Use Energy Efficiency
- Renewable Energy Technologies
- Transportation

Modesto Irrigation District Smart Meter and Customer Interface Project is the final report for the Modesto Irrigation District Smart Meter and Customer Interface Project (contract number PIR-11-015), conducted by Modesto Irrigation District. The information from this project contributes to Energy Research and Development Division's Energy Technology Systems Integration Program.

For more information about the Energy Research and Development Division, please visit the Energy Commission's website at www.energy.ca.gov/research/ or contact the Energy Commission at 916-327-1551.

ABSTRACT

Modesto Irrigation District is a community owned utility providing electricity, and water to more than 115,000 customers in the greater Modesto, California area. The utility embarked on a $21 million Advanced Metering Infrastructure project to design and install a robust wireless mesh network infrastructure that would serve as the communication backbone for the district's customers. This project will include automated meter reading, online customer interface, cyber security, reliability enhancements, data reporting, and distribution automation.

Modesto Irrigation District first implemented the Customer Interface Web Portal in March 2012, which allowed customers to use online services such as eBilling, eUsage, and ePayment over the internet. As these new internet interfaces were developed and used by customers, it became apparent that enhanced cyber security was also required. Modesto Irrigation District spent $1.6 million in 2013 and 2014 to upgrade security software and related hardware enhancements, improving the Automated Metering Infrastructure system security.

With these enhanced cyber security measures, 13,208 customers have created online accounts to safely access eBilling, eUsage, and ePayment services.

Keywords: Advanced Metering Infrastructure, Customer Interface Web Portal, Cyber Security

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TABLE OF CONTENTS

PREFACE ..... **i**

ABSTRACT ..... **ii**

TABLE OF CONTENTS ..... **iii**

LIST OF FIGURES ..... **iv**

LIST OF TABLES ..... **iv**

EXECUTIVE SUMMARY **1**

Introduction 1

Project Purpose 1

Project Results 1

Project Benefits 2

CHAPTER 1: Introduction **3**

1.1 Smart Grid Investment Grant 3

1.2 California Energy Commission PIER Grant 4

1.2.1 Scope of Work 5

1.2.2 Vendor Selection 7

1.2.3 Budget 7

1.2.4 Grant and Reporting Requirements 8

CHAPTER 2 Customer Interface Web Portal & Cyber Security Project **9**

2.1 Original Purpose 9

2.2 Requirements 10

2.3 Approach 10

2.4 Results 11

CHAPTER 3: Conclusions **15**

3.1 Advancements in Technology 15

3.2 Benefits to Ratepayers 15

3.3 Ongoing Efforts 15

GLOSSARY **16**

APPENDIX A: MID's Online Services Help Guide A-1

LIST OF FIGURES

Figure 1: Daily Usage Detail View 12

Figure 2: Hourly Usage Detail View 13

Figure 3: Account Summary View 14

LIST OF TABLES

Table 1: Budget Summary by Task 8

Table 2: Average Customer Service Interaction 9

EXECUTIVE SUMMARY

Introduction

Modesto Irrigation District (MID) is a publicly owned utility providing electricity and water to more than 115,000 customers in the Modesto area. In 2009, MID embarked on a $21 million Advanced Metering Infrastructure (AMI) project to design and install a robust wireless mesh network infrastructure serving as the communication backbone for automated meter reading, online customer interface, reliability enhancements, data reporting, and distribution automation..

With funding from a U.S. Department of Energy smart grid investment grant, MID initiated several projects leveraging its Advanced Metering Infrastructure (AMI) system. These projects included Smart meter installation, distribution system upgrades, customer interfaces, studies on billing and cost of service, cyber security and training and retention.

Project Purpose

MID began the Customer Interface Web Portal portion of the AMI project, allowing customers to interface with services such as eBilling, eUsage, and ePayment over the internet. As these new interfaces were developed, a concern involving cyber security arose. The necessity for enhanced AMI system security became apparent. As these new internet interfaces were developed and used by customers, it became apparent that enhanced cyber security was also required.

MID spent $1.6 million in 2013 and 2014 to upgrade security software and related hardware enhancements with Silver Spring Networks to improve AMI system security. The Customer Interface Web Portal project was a component of that security upgrade to provide a safe, reliable interface for customers to have the ability to participate in such services as eBilling, eUsage, and ePayment over the internet. The Energy Commission PIER Grant was used to fund a portion of the established security measures for MID's smart grid network.

Project Results

MID designed and launched a new online customer portal. Since the initial launch of MID's online customer portal, more than 13,000 customers have created online portal accounts, including more than 350 commercial accounts and more than 12,850 residential accounts. MID and Silver Springs Network planned, designed, tested and deployed KeySafe and Critical Operations Protector modules to increase MID's cyber security and protect MID customers while using the online portal.

Project Benefits

Customers are capable of using online services including eBilling, eUsage, and ePayment. Each month an average of 11,000 customers regularly login to view energy use history and pay their bill using the customer portal. MID has collected almost $17 million in district revenues from the customer portal's ePayment in 2014 alone. MID anticipates more customers adopting the online portal, resulting in improved efficiency in the customer service department.

In addition to convenience of customer online services, the AMI system also reduces truck rolls and fleet fuel use. Most service turn-ons and turn-offs are now done remotely from the main office. Before project implementation, MID would dispatch a technician in a truck for each turn-on /turn-off, entailing a 90-mile-drive (round-trip) to serve the Mountain House area.

The new systems have improved stability of end-of-line voltage enabled by continuous monitoring and feedback into the control system. Distribution line losses have also been reduced, resulting in a more efficienctly operated system.

CHAPTER 1: Introduction

The Modesto Irrigation District (MID) was formed on July 23, 1887 under the California Irrigation Act of 1887. In 1904, MID first made water available for irrigation to its water users and electric service was added in 1923 when the Don Pedro Dam and Powerhouse were completed. In 1995, with the completion of the Modesto Regional Water Treatment Plant, the MID began providing wholesale treated water to the City of Modesto. Today, the utility employs more than 440 people, providing irrigation service to more than 3,600 customers and electrical service to more than 110,000 customers.

MID is an independent, publicly owned utility. It provides benefits that include community ownership, control by a locally elected Board of Directors, and business operation on a not-for-profit basis. MID is committed to providing reliable service at the lowest cost possible. MID's electric service area includes the greater Modesto area (north of the Tuolumne River), Waterford, Salida, Mountain House and parts of Ripon, Oakdale and Riverbank.

1.1 Smart Grid Investment Grant

The Smart Grid Investment Grant (SGIG) program was authorized by the Energy Independence and Security Act of 2007, Section 1306, as amended by the American Reinventment and Recovery Act (ARRA). This grant program accelerated the modernization of the nation's electric transmission and distribution systems and promotde investments in smart grid technologies, tools, and techniques that increased flexibility, functionality, interoperability, cyber security, situational awareness, and operational efficiency. 1MID was awarded funds from the U.S. Department of Energy in connection with the Smart Grid Investment Grant Program, a grant opportunity within the ARRA.

The MID's Smart Grid Deployment and Installation project installed an AMI system, a meter data management system (MDMS), and a web portal to enable customers to better manage their electricity consumption and costs. AMI is a system of smart meters, two-way communications networks, and data management systems implemented to enable metering and other information exchange between utilities and their customers.

MID's smart meter deployment covered the Mountain House Development, a single isolated area with approximately 3,350 customer sites. The project also included installing distribution automation (DA) equipment for up to eight substations and 43 cap banks, which aimed to reduce system-wide losses, while improving voltage control. The smart meters and web portal allowed MID to consider implementing time-based rate programs in the future.

[1] https://www.smartgrid.gov/recovery_act/overview/smart_grid_investment_grant_program

MID's SGIG project was considered a "cross cutting project" by the Department of Energy and covered these categories:

- Communications infrastructure: The project expanded a preexisting wireless neighborhood area network for the backhaul communications infrastructure. Smart meters equipped with wireless network cards connect into the communications infrastructure and transmit the data back to MID offices. The infrastructure provides two-way communication, facilitating a variety of smart meter functions and applications.
- AMI: The AMI system provided for several features in addition to automated meter reading, including remote connect/disconnect, outage detection and reporting, power quality monitoring, and tamper detection. The MDMS further processes, validates, and prepares the meter data for billing and web presentment. The meters offered a variety of benefits including reduced meter reading costs and potential to improve outage notification for faster restoration times.
- Customer system programs: A customer web portal facilitated two-way information exchange between the customers and MID and enabled the participating customers to better manage their electricity use and monthly bills. Through the web portal, customers can monitor hourly, daily, weekly, or monthly electricity use and view and pay their bills.
- Distribution system energy efficiency improvements: MID deployed automated capacitors and volt/volt–ampere reactive (VAR) control to improve power quality and reduce line losses. The volt/VAR controls and the automated capacitors help to maintain optimal voltage levels in the distribution system, thus improving the system's operational efficiency and reducing operations and maintenance costs. MID identified a test substation for a Phase One deployment, piloted the new equipment, and plans to use Phase One results to determine the substations and system upgrades to be included in Phase Two.

1.2 California Energy Commission PIER Grant

MID was awarded $149,315 under the California Energy Commission PIER Program to accomplish the following objective: facilitate customer access to and use of their load profile data by implementing a customer portal/interface.

Stimulating smart grid investment was one of the purposes of the ARRA. The majority of ARRA smart grid funding was allocated to the US Department of Energy for its SGIG program and MID was a grant recipeint. A portion of the ARRA smart grid funding was allocated to State Energy Offices (SEOs) to further smart grid developments being promoted at the state level. California's SEO grant funds were administered by the California Energy Commission and used, in part, to support the SGIG projects of the DOE grant awardees.

The focus of the California Energy Commission's PIER grant program was to facilitate further investment in the smart grid in California. At the time of MID's grant application, MID was

already substantially underway or complete with the various DOE SGIG projects, so the PIER grant needed to focus on a project area where further work and expenditure would occur in addition to the co-funding provided by the DOE.

1.2.1 Scope of Work

The Scope of Work for the customer portal/interface was divided into two parts: eBilling application enhancements and command center application enhancements. The eBilling application enhancements included: user account identification, account type based process flow, updates to usage detail, usage and demand graphs for commercial users, and payment process flow. The Command Center application enhancements included: payment related job confirguration and account reconciliation.

The existing eBilling application was modified to incorporate the following requirements:

1. User Account Identification

Identify user account type i.e. Commercial and Non-Commercial based on the flag provided at account level.

2. Account Type Based Process Flow

Updated current process flow to show appropriate details based on account type.

Commercial Users

Commercial users have:

- Access to usage and demand graph details
- ACH payment option
- Recurring payment option

Non-Commercial Users

Non-Commercial users have:

- Access to existing electric usage graph details
- ACH and Credit card payment option
- Recurring payment option
- Update to Usage Details

Following details were added to existing non-commercial user's usage details screen:

- Service address – on Usage and Bill Summary screens
- Total consumption
- Current usage – unbilled activity

- Commercial Usage and Demand Details

For commercial users new graphs were added to show daily usage and demand graphs. In addition to existing display these screens show:

- Service address – on Usage and Bill Summary screens
- Total consumption
- Peak demand
- Peak demand date
- Current usage – unbilled usage details

3. Updated Payment Process Flow

Prior functionality provided access to credit card payment option. Using Wells Fargo screen user can input credit card details to make payment. New implementation allows users to create and maintain payment accounts within eBilling application in compliance with applicable PCI security requirements.

The following options are available for users:

Commercial users are allowed to add only ACH payment accounts, they would have capability to:

- Add, edit and delete ACH payment account
- Make one-time payment using their payment account
- Select one or more commercial payment accounts
- Select All commercial payment accounts
- Each selected account has a separate payment transaction to record which account receives the payment.
- Make recurring payment using their payment account

Non-Commercial users are allowed to add ACH and Credit card payment accounts, they have capability to:

- Add, edit and delete ACH and Credit card payment accounts
- Make one-time payment using their payment account
- Select one or more residential payment accounts
- Select All residential payment accounts
- Each selected account has a separate payment transaction to record which account receives the payment.

- Make recurring payment using their payment account

4. Command Center Application Enhancements

New jobs were added as per the enhancement requirements. To process ACH and recurring payment following jobs were added:

- Check submit – to process check payments
- Check update – to update check payment status
- Credit card submit – to process credit card payments
- Recurring payment – to process recurring payment
- Account reconciliation – to consolidate payments

1.2.2 Vendor Selection

MID selected Silver Springs Network (SSN), based in Redwood City, California, as its smart meter networking provider. Silver Spring Networks builds networks that enable a utility to make the business changes necessary to improve efficiency, reliability, and customer service while reducing costs. Built for real-time networking, its open standards permit multiple vendors to innovate new products and services for the utility while remaining scalable and secure for system-wide implementation. Their software platform seamlessly integrates these new networking technologies while simultaneously building in redundancy, integrity, reliability and increasing operational efficiencies. SSN has created a critical networking infrastructure for the smart grid, known as a Smart Energy Network. Based on the Internet Protocol (IP_ suite) it addresses the challenges of running multiple applications and devices on a common networking infrastructure using multiple transport technologies, which in turn, dramatically improves efficiency, lowers costs and ensures the reliable delivery of services. SSN has a proven track record and is highly acclaimed in its field. In 2008, it was named a Technology Pioneer at the World Economic Forum in Davos, Switzerland, was a recipient of the GoingGreen and Brilliant Innovation Awards in 2007, Going Green Top 100 and AlwaysOn Global 250 in 2008.

1.2.3 Budget

The PIER Cost Share focused on Task 5: Customer Interface. The entire allotment of $149,315 from the PIER Grant was expended on the cyber security upgrades through Silver Springs Network for MID's customer interface and corresponding network. As shown in Table 1: Budget Summary by Task, MID allotted additional funds for other project categories including $270,920 for Smart Meter Installation, $183,773 for Distribution System Upgrades (Phase 1), $558,476 for Distribution System Upgrades (Phase 2), $250,000 for Billing and Cost-of-Service Studies, $49,942 for Cyber Security, $25,039 for Training and Retention. MID also received additional match funds from the DOE for each of the categories listed. The total amount spent in PIER Cost Share was $149,315, in DOE funds was $1,493,150 and by MID was $1,955,259, for a total project cost of over $3,597,724.

Table 1: Budget Summary by Task

Task #	Task Name	PIER Cost Share ($)	DOE Funds ($)	Match Funding ($)	Total ($)
1.1	Attend Kick-off Meeting	$0	$0	$0	$0
1.2	Critical Project Review Meetings	$0	$0	$0	$0
1.3	Final Meeting	$0	$0	$0	$0
1.4	Quarterly Progress Reports	$0	$0	$0	$0
1.5	Final Report	$0	$0	$0	$0
1.6	Identify and Obtain Matching Funds	$0	$0	$0	$0
1.7	Identify and Obtain Required Funds	$0	$0	$0	$0
1.8	DOE Reporting	$0	$25,000	$25,000	$50,000
2	Smart Meter Installation	$0	$270,920	$270,920	$541,840
3	Distribution System Upgrade- Phase 1	$0	$183,773	$183,773	$367,546
4	Distribution System Upgrade- Phase 2	$0	$558,476	$558,476	$1,116,952
5	Customer Interface	$149,315	$130,000	$592,109	$871,424
6	Billing and Cost-of-Service Studies	$0	$250,000	$250,000	$500,000
7	Cyber Security	$0	$49,942	$49,942	$99,884
8	Training and Retention	$0	$25,039	$25,039	$50,078
	Total	**$149,315**	**$1,493,150**	**$1,955,259**	**$3,597,724**

1.2.4 Grant and Reporting Requirements

MID attended the required "Kick-Off" meeting with the Energy Commission Project Manager on January 3, 2013. The meeting consisted of a general review of contract terms and conditions, invoicing processes and accounting documentations, project schedule, deliverables and budget, and the processes required for providing quarterly and other status reports.

MID also participated in several Critical Project Review Meetings (CPR) with the Energy Commission Project Manager to identify any needed modifications to the tasks, products, schedule, and budget. The CPRs provided opportunities for discussions with the Project Manager and MID throughout the grant implementation and invoicing process. MID provided the Energy Commission with the progress reports submitted to the DOE, including SGIG Semi-annual Impact Metrics Reports, SGIG Monthly SIPRIS Status Reports, and SGIG Quarterly Build Metrics Reports.

CHAPTER 2
Customer Interface Web Portal & Cyber Security Project

2.1 Original Purpose

Before implementing the Customer Interface Web Portal, interaction with customers was handled over the phone, by mail or e-mail and over-the-counter personal contact (Table 2).

Table 2: Average Customer Service Interaction

Number of calls per week	4,500
Number of customers over-the-counter per week	2,650
Number of e-mails per week	225
Checks/stubs processed per day	5,000
Web Site visitors per month	5,000

The primary purpose of the Customer Interface Web Portal Project was to create an opportunity for customer self service with the following features:

- Provide controlled access and a secured environment for all customer inquiries and transactions
- Providing up-to-date account information including payment history and current balance
- Customer online payments
- Ability for customers to update specified account information (i.e. mailing addresses)
- Interactive graphical view of customer energy usage as it would relate to the proposed Time of Use (TOU) structures
- Flexibility to interact with different back-end office systems, yet maintain compliance with Federal, State and Local laws on Identity Theft
- Documentation for design, implementation and training of newly designed system

Cyber Security has been identified as one of the most important areas of concern for the nation's electricity grid. MID recognized that the same technological advances that enabled deployment of smart technologies also created vulnerabilities to virtual and physical attacks. MID worked to

develop a robust and secure network, adopted federal cyber security guidelines and protocols through leveraging proven internet protocol security measures.

2.2 Requirements

- Thorough, effective, and sustainable infrastructure protection posture
- Systems that are engineered with sufficient resiliency to absorb a failure, recover, and continue to provide critical functionality
- Deployable on a large scale, upgradeable on a continuous basis, and expandable without significant interruption in operations
- Address design, deployment, maintenance, and operation of large-scale infrastructure protection systems that must run continuously for long periods of time
- Secure network architectures, including defense in depth and compartmentalization
- Authorization and access control
- Auditing and logging
- Configuration control and patch management

2.3 Approach

MID researched and interviewed several vendors that could provide turn-key web portal services to provide both on-line payment options and meter usage data and histories. Concerns over project cost, complexity of data transfers, and program flexibility, led MID to pursue an in-house approach for developing and hosting these services. The Information Technology Department at MID created a comprehensive automated customer web portal and selected SSN to deploy the cyber security portion of the project.

Silver Springs Network designed their system to meet threats of all kinds: system-level threats such as denial-of service attacks, network barge-ins, or compromising of hardware or meters themselves; theft of service threats such as data manipulation, cloning or illegally migrating unauthorized devices into the service territory; privacy and confidentiality threats that compromise the security of data in storage or in transmission. SSN incorporated high reliability and security standards that meet or exceed federal standards (Federal Infrastructure Protection Standards (FIPS)). Specifically, SSN systems conform to FIPS 140-2 Security Levels 3 (for Cryptographic Modules).

In a changing environment, SSN incorporated secure over-the-air firmware upgrades that can provide timely upgrades to enhance changing security requirements and technologies. Silver Spring's system, called UtilityIQ for Advanced Metering includes support for their utility operating systems.

Silver Spring designed MID-specific PRODUCTION and TEST KeySafe and COP architectures. SSN assisted MID in designing a TEST solution to enable monitoring, logging, name resolution, time and other required services. Once the design was complete, Silver Spring installed and configured the KeySafe and COP modules into MID's TEST environment, meeting MID's requirements to support up to 1,000 devices. MID conducted Acceptance Testing of UIQ KeySafe and COP in the TEST environment to validate that it performs as designed.

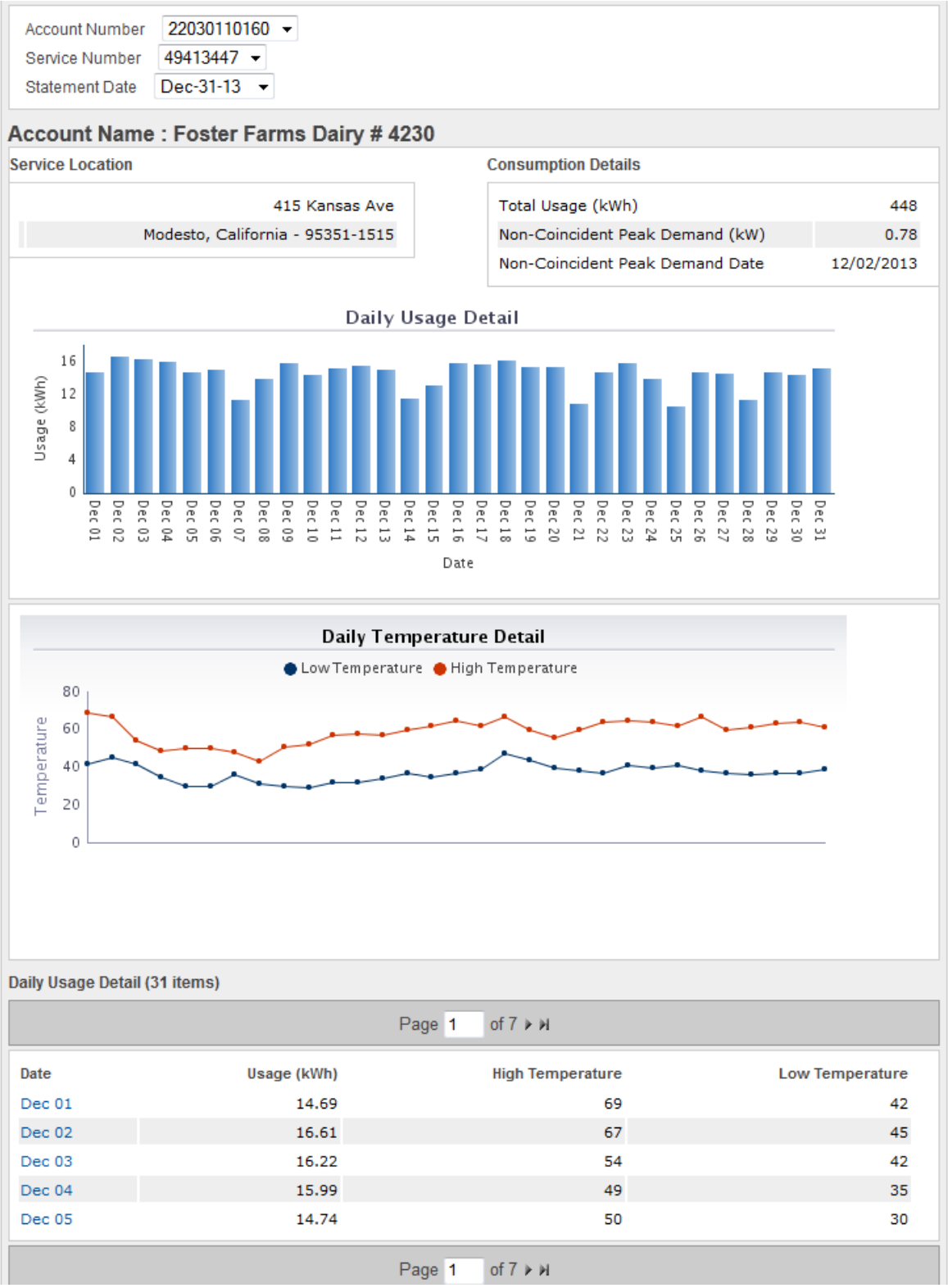
2.4 Results

Since the initial launch of the web portal, more than 13,200 customers have created online portal accounts, including more than 350 commercial accounts and more than 12,850 residential accounts.

The web portal allows customers to view daily usage, and drill down to view hourly usage details. The portal allows customers to query this information by account number, service number, and statement date.

Customers can view monthly usage, with a graph breaking it down by day, with details including total use for the period, non-coincident peak demand, and the date the non-coincident peak demand occurred (Figure 1). Figure X also demonstates the customer's ability to view corresponding daily temperature data to evaluate the temperature effects on their regular usage patterns.

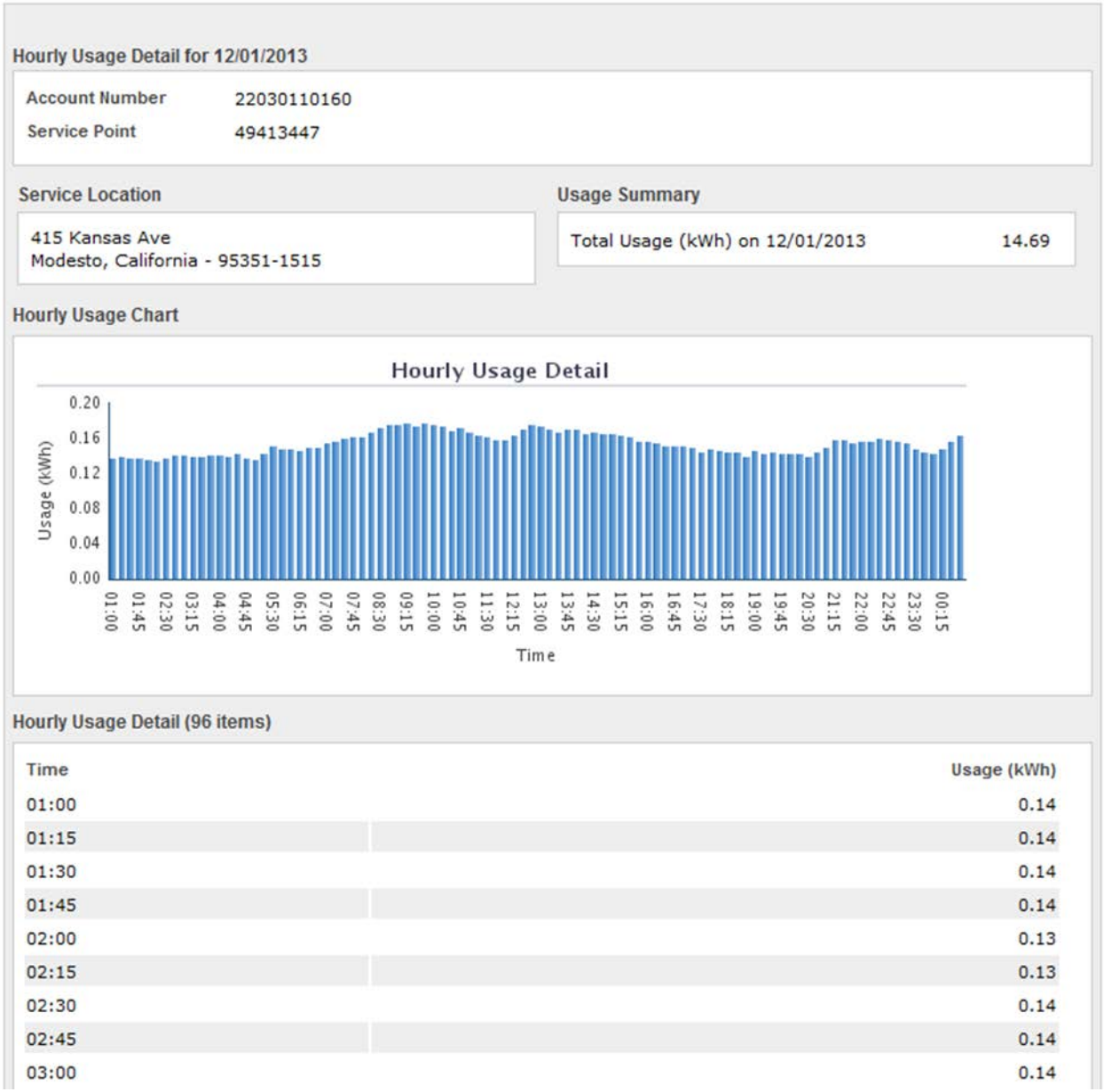
Figure 1: Daily Usage Detail View



Date	Usage (kWh)	High Temperature	Low Temperature
Dec 01	14.69	69	42
Dec 02	16.61	67	45
Dec 03	16.22	54	42
Dec 04	15.99	49	35
Dec 05	14.74	50	30

MID customers can also view hourly use data in fifteen minute increments (Figure 2).

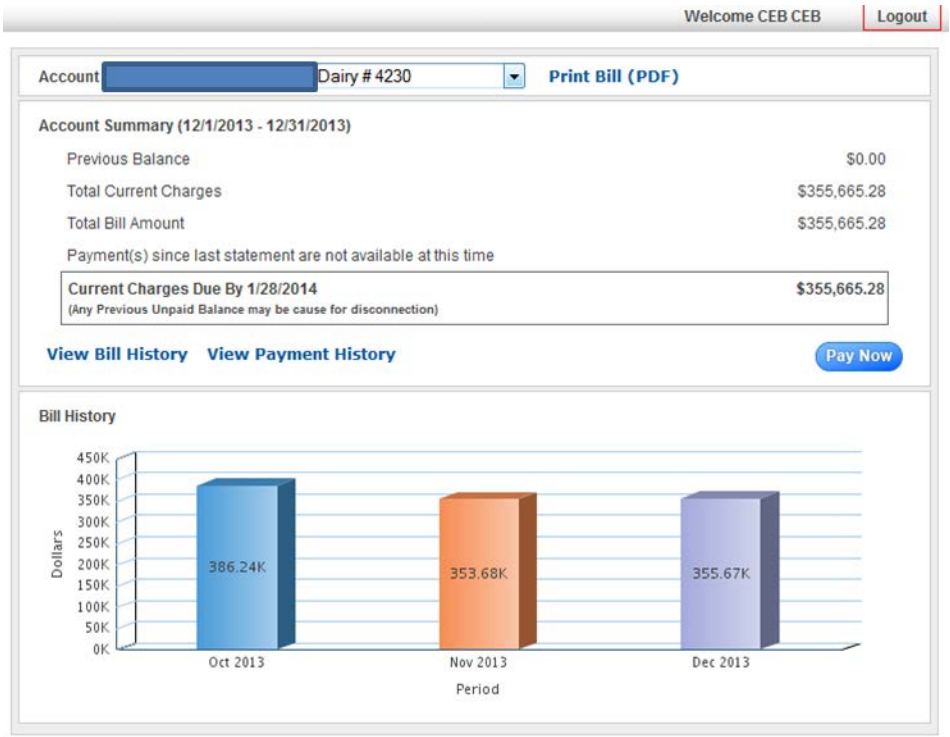
Figure 2: Hourly Usage Detail View



Time	Usage (kWh)
01:00	0.14
01:15	0.14
01:30	0.14
01:45	0.14
02:00	0.13
02:15	0.13
02:30	0.14
02:45	0.14
03:00	0.14

In addition to the ability to view daily and hourly energy usage, the portal also allows the customer to view and pay their bills online (Figure 3). Customers can view previous balances, current charges, total bill amounts and payment history for the last three months. If interested, the customer can click on either of the hyperlinks to view further billing history and payment history. This is also the section of the customer portal that allows the customer to click the "Pay Now" button to make an online payment

Figure 3: Account Summary View



For cyber security on the portal, Silver Springs Network installed and configured UIQ KeySafe and COP modules into MID's PRODUCTION environment, with the supporting infrastructure configured for High Availability (HA). SSN configured the PRODUCTION instance of KeySafe and COP to meet MID's requirements to support up to 150,000 AMI devices, and to support MID's monitoring and management of the ongoing solution.

Upon completion of Validation Testing in the PRODUCTION environment, MID accepted the implementation of KeySafe and COP in its PRODUCTION environment in writing.

CHAPTER 3: Conclusions

3.1 Advancements in Technology

The advanced technologies implemented through assistance from the DOE and Energy Commission grants, proved beneficial to MID, including reduced operating and maintenance costs and supported better detection of energy diversion, resulting in correcting tampered service situations. The new technology of the AMI system also reduces truck rolls and fleet fuel usage. Most service turn-ons and turn-offs are now done remotely via the main office. Prior to project implementation, MID would dispatch a technician in a truck for each turn-on /turn-off, entailing a 90-mile-drive (round-trip) to serve the Mountain House area.

3.2 Benefits to Ratepayers

- Improved power quality: The project has improved stability of end-of-line voltage enabled by continuous monitoring of that parameter and feedback into the control system.
- Reduced distribution line losses: Voltage is maintained in the lower band of the acceptable range, and the power factor is maintained closer to unity, which results in a more efficiently operated system.
- Convenience of online services: Customers can now safely access the MID online portal to view and pay their bill and access their usage data from the convenience of their computer. This not only saves customers time and fuel costs to come into the office, but also provides them with the tools to take a proactive approach to energy efficiency in their home.

3.3 Ongoing Efforts

MID is presently developing Phase Two of its volt/VAR project, utilizing experience gained from the pilot. The infrastructure installed provides a platform from which to deploy additional smart grid technologies, such as automated circuit switching and automated detection of power interruption.

MID continues to work with SSN to enhance and improve cyber security. In 2015, SSN will manage and execute disabling of the clear-text port on all reachable AMI Production meters, Relays, and Access Points ("APs"). SSN will manage and execute enabling LL compatability mode on all reachable AMI Projection meters, Relays, and APs.

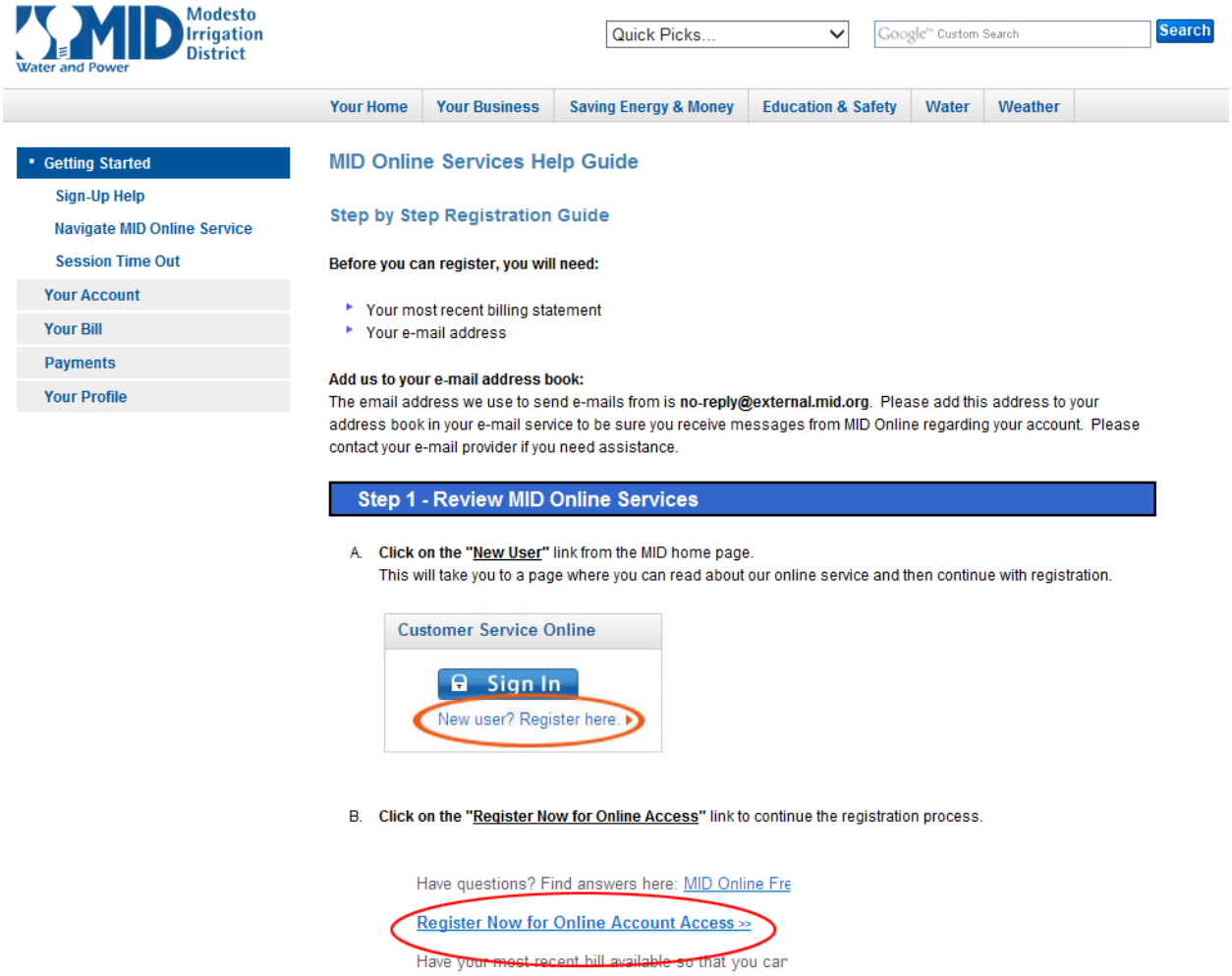
MID will be responsible for ongoing monitoring of the HSMs and COPs. This will include the monitoring of the management interfaces on the device for health and performance information used in alert management. MID will be responsible for the ongoing monitoring of COP alerts related to remote connections and disconnections as well as threshold monitoring or changes to administrative access.

GLOSSARY

Term	Definition
Acceptance Testing	Acceptance Testing means the procedures by which Silver Spring and/or MID perform a series of tests to validate, measure and verify Product functionality.
AMI	Advanced Metering Infrastructure
COP	Critical Operations Protector ("COP") means an enhanced security module in the UtilityIQ suite of applications specifically designed to ensure the operator executing certain critical commands, such as remote disconnect and reconnect, is properly authorized and to limit the rate at which certain critical commands can be executed from UIQ-AMM.
DA	Distribution Automation
DOE	Department of Energy
EPIC	Electric Program Investment Charge
HA	High Availability ("HA") means two (2) physical hots (local to one other, one actively receiving requests, one configured and standing ready) that are setup in an automatic fallover method. UIQ recognizes both HSM devices and automatically fails over to the 2nd device if the 1st device becomes unavailable.
HSM	Hardware Security Module ("HSM") means the hardware component that COP and Keysafe reside on. Model HSM-BDL-SECL-Se50Components includes: 19 in. Network Appliance {2 rack units w/Ethernet I/F}- Serial RS2232 Interfaces- 3 Smart Cards- 1 Pinpad- 1 ea. Network connection cable- User Documentation CD.
LL	Link Layer Security (Compatability Mode) ("LL") means the phase in enabling Link Layer security in which the Communcations Module (NIC) is able to communicate with devices which either (a) have Link Layer security turned off or (b) have Link Layer Security (Strict Mode) turned on.
SGIG	Smart Grid Investment Grant
SSN	Silver Spring Networks
Smart Grid	Smart Grid is the thoughtful integration of intelligent technologies and innovative services that produce a more efficient, sustainable, economic, and secure electrical supply for California communities.

Validation Testing	Validation Testing means tests performed to confirm product functionality per the mutually agreed upon criteria between MID and SSN.

APPENDIX A:
MID's Online Services Help Guide



Step 2 - Terms and Conditions

A. **Review the MID Online Terms and Conditions** and print a copy for your records.
B. **Check the box** verifying that you have read the Terms and Conditions.
C. **Click "Register Now".**

If you have any questions or comments about our privacy policy you may contact us using the information below: Phone #: (209) 526-7337 Toll free phone #: (888) 335-1643 Email: customerservice@mid.org

☐ I have read and accept the Terms of Use.

Register Now

Step 3 - Complete Enrollment Form

A. **Complete the New User Enrollment Form**
Use the "Where is this?" links to help you locate the required information on your billing statement.

* Account Number [ ] **where is this?**
*Amount Due [ ] **where is this?**

B. **Enter personal information**
1. Name
2. Address
3. Phone Number
4. E-mail Address

C. **Create your password and security question**
Password Rules:
- At least 8 characters
- One upper case letter
- One lower case letter
- One number
- Cannot be the same as your user name
- Cannot equal a previously entered password

Note: The security question will be used as verification if you lose your password.

- Getting Started
  - Sign-Up Help
  - Navigate MID Online Service
  - Session Time Out
- Your Account
- Your Bill
- Payments
- Your Profile

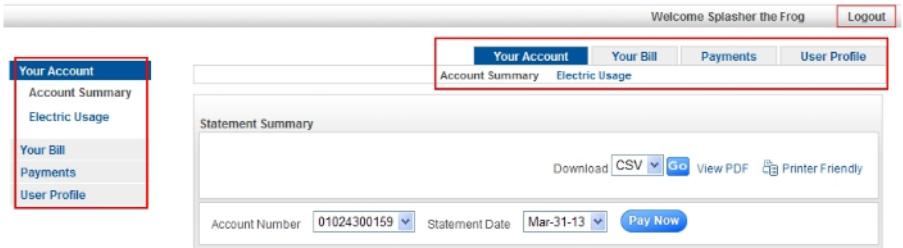
MID Online Services Help Guide

Navigating MID Online

There are two ways to navigate MID Online. (Picture shown below.) The first is on the left side of the page. The second is to the right, above the main content area. You can use either or both navigation options. They will take you to the same pages.

MID Online is divided into four sections:

1. **Your Account**
2. **Your Bill**
3. **Payments**
4. **User Profile**



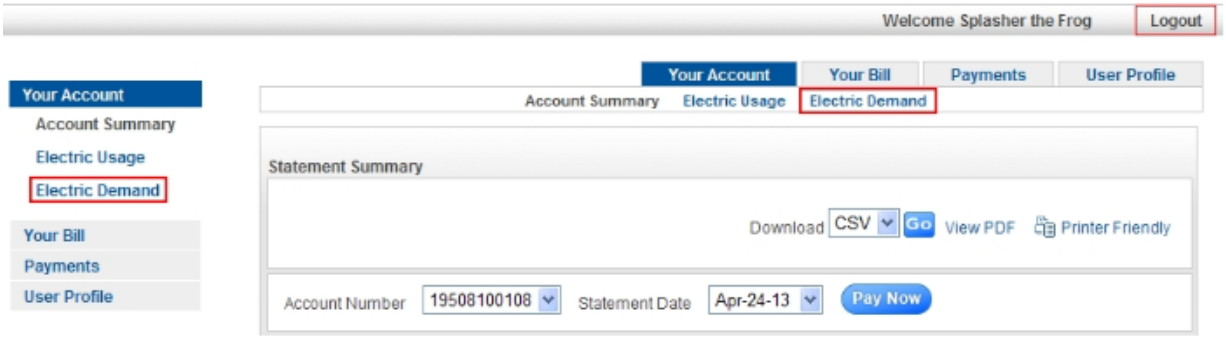
Your Account

Account Summary: This is the main page you see after logging in

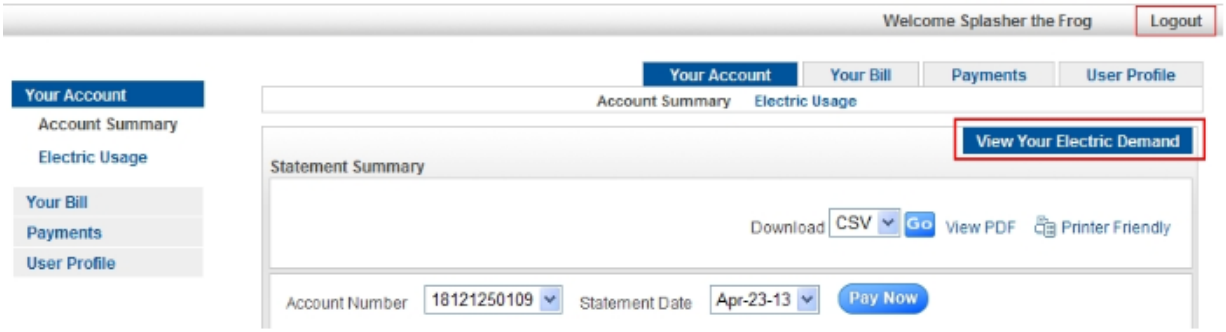
Electric Usage: This is where you can track your electricity consumption over time

Electric Demand: This shows the maximum amount of electrical energy that is being consumed during a billing period (Electric Demand links are available for commercial service only)

MID Online accounts with only commercial service have two Electric Demand links on the Account Summary page:



MID Online accounts with both residential and commercial service have a single Electric Demand link for commercial accounts on the right side of the screen:



Your Bill

- Details of your service location billing

Payments

Pay Your Bill:	This is here you pay your bill
Online Payments:	This lists the status of past and scheduled online payments
Payment History:	This is all online and other payments for the account are listed
Payment Accounts:	This is where you create payment methods used to make online payments
Recurring Payments:	This is used to schedule automatic payments

User Profile

- Add Account: add electric accounts to your MID Online

  See also: Manage Multiple Accounts with MID Online

- Your Information: used to change or update your name, phone, e-mail, address, password, and security question

- Notifications: select what e-mail notifications you receive

- Getting Started
- • Your Account
  - Account Summary Explained
  - View Service Locations
  - Electric Usage Explained
  - Hourly Usage
- Your Bill
- Payments
- Your Profile

MID Online Services Help Guide

Account Summary Explained

Navigate to: Your Account > Account Summary

The Account Summary screen is a summary of your bill.
Notice: The information on this screen will not reflect payments or other activity that occurs after your Statement Date.

Account Name : Splasher the Frog

Balance Summary

Previous Balance	$240.00
Payments Posted - Thank You	$(240.00)
Total Adjustments	$0.00
Balance Forward A	$0.00

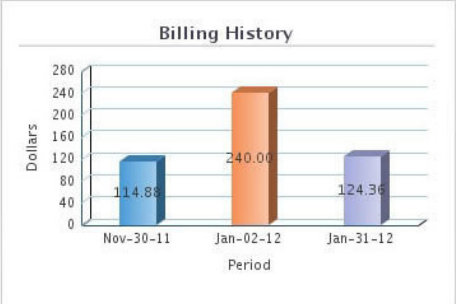
Current Charges

Total Current Charges Due by 02/22/2012 B	$124.36

Total Charges (1 items)

Total Account Charges As Of Statement Date C	**$124.36**

A + B = C



Balance Forward (A) is the total of:

- Previous Balance
- Payments Posted
- Total Adjustments

Note: Balance Forward may be zero if you have completely paid off your prior bills.

Current Charges (B):

- Total current service charges for the Statement Date
- To view detailed service charges, go to *Bill Summary* under the Your Bill menu

Total Account Charges As Of Statement Date (C):

- Total Account Charges (C) is the sum of Balance Forward (A) + Current Charges (B).
- **Total Account Charges (C) is the *amount you need to pay*.**
- This total will **not be updated** to reflect a payment made after the Statement Date.

Billing History Graph

- The Billing History graph on the right of the page shows current and past months of your account and the total amount of previous bills.

See More Information

- To see a more detailed bill statement, click on View PDF.
- To see payments made after the bill Statement Date, go to Payment History under the Payment menu.

Getting Started
- Your Account
  - Account Summary Explained
  - View Service Locations
  - Electric Usage Explained
  - Hourly Usage
- Your Bill
- Payments
- Your Profile

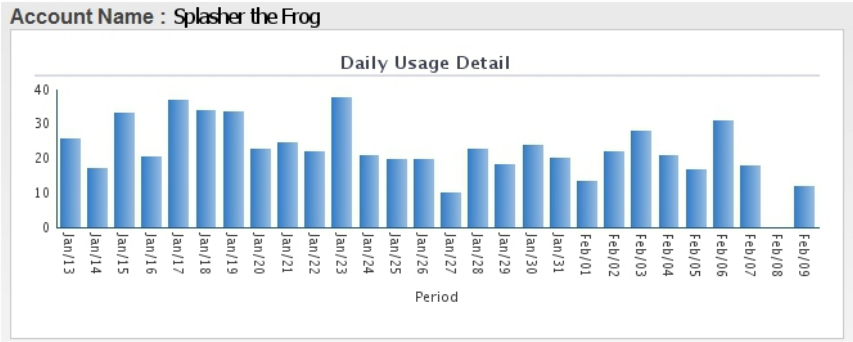
MID Online Services Help Guide

Electric Usage

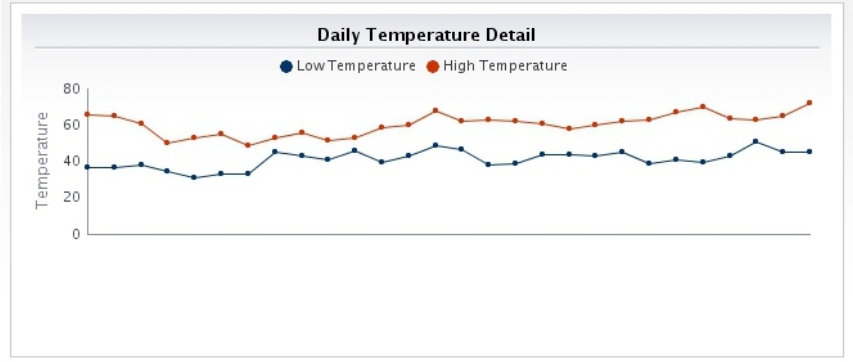
The Electric Usage page lets you track how much electricity you use.

- Electric usage displays for each service address
- Only electric usage for meters is displayed on this page

  Un-metered dusk-to-dawn lights, for example, will not have electric usage information



- The Daily Usage Detail graph shows your daily electric usage (kWh)



- The Daily Temperature Detail graph shows the high and low temperatures for the same dates
  - The temperature may affect how much electricity you use
  - For example, a spike in your electric usage may be tied to a day with a higher temperature

Daily Usage Detail (29 items)

Page 2 of 6

PERIOD	Total Usage(kWh)	High Temperature	Low Temperature
Jan/31	169.52	58	44
Feb/01	170.32	60	43
Feb/02	161.72	62	45
Feb/03	161.28	63	39
Feb/04	158.28	67	41

Arrow buttons Page 2 of 6

Click on the date link to see hourly detail usage

- The Daily Usage Detail table displays the data shown in the graph

Navigating the Electric Usage page:

- Use the arrow buttons to move between the pages of the Daily Usage Detail table
- Click on a date on the Daily Usage Detail table to view the Hourly Usage
- Use the Statement Date drop-down list to view past dates
- Use the Service Number drop-down list if you have more than one service address
- Use the Account Number drop-down list if you have more than one MID electrical account

- Getting Started
- Your Account
  - Account Summary Explained
  - View Service Locations
  - Electric Usage Explained
  - Hourly Usage
- Your Bill
- Payments
- Your Profile

MID Online Services Help Guide

Hourly Usage

The Hourly Usage Detail graph shows your hourly electric usage for the selected date.

The Hourly Usage Chart is a graphical representation of the Hourly Usage Detail table. Both the table and chart show the electrical usage per hour for the account.

Hourly Usage Detail for 01/17/2012

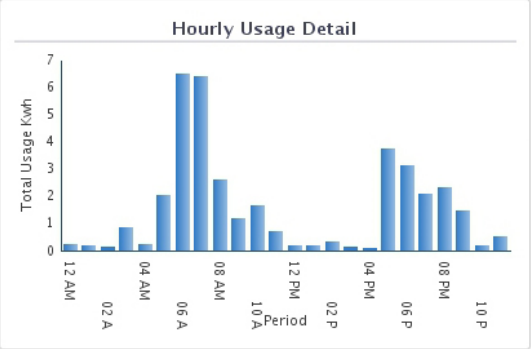
Account Info

Account Number	01234567890
Service Point	98765432
Date	01/17/2012

Usage Summary

Total Usage on 01/17/2012	37.11
Total Produced on 01/17/2012	0.00

Hourly Usage Chart



Hourly Usage Detail (24 items)

Time	Total Usage(kWh)	Produced
12 AM	0.22	0
01 AM	0.18	0
02 AM	0.16	0
03 AM	0.84	0
04 AM	0.22	0
05 AM	2.06	0
06 AM	6.48	0
07 AM	6.42	0
08 AM	2.59	0
09 AM	1.17	0
10 AM	1.66	0
11 AM	0.71	0
12 PM	0.19	0
01 PM	0.21	0

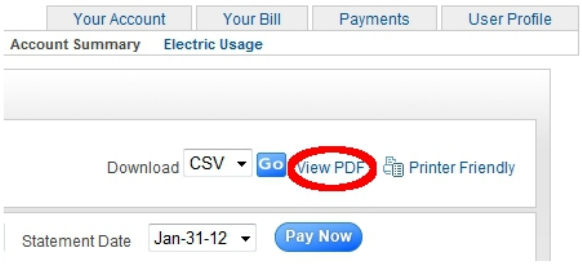
Getting Started
Your Account
• Your Bill
Check Your Bill
Bill Costs Explained
Sample Bill
View Past Bills
Payments
Your Profile

MID Online Services Help Guide

Checking Your Bill

On the Your Bill page, you can select the Account Number, Service Number, and Statement Date to see the charges for the selected bill.

Otherwise, to view your actual bill, under the Your Account or the Your Bill section, click "View PDF". This will open an Adobe PDF version of your bill.



This electronic bill can be printed out for your records by clicking the second icon from the left, an image of a printer.

The print button can be found either in one of two places:

Top left area of the screen.

Bottom center of the Adobe PDF document. You need to move you mouse around in this area for this option bar to appear.

Getting Started
Your Account
• Your Bill
Check Your Bill
Bill Costs Explained
Sample Bill
View Past Bills
Payments
Your Profile

MID Online Services Help Guide

Bill Summary

Understanding Service Charges

The Bill Summary page shows the detailed service charges.

- Service charges display by statement period for each service address
- If you have multiple service addresses, the Total Current Charges amount is the total of all of your service addresses

Your Account | Your Bill | Payments | User Profile

Bill Summary

Bill Summary

Download Download CSV Go View PDF Printer Friendly

Account Number 01024300159
Service Number 51793534
Statement Date Mar-31-13

Account Name : Sakuntla Dutt

Service Location

1413 Leonard Ave
Modesto, CA - 95350-5719

Service Detail Charges (8 items)

Charge Type	Total Charges
City Tax (6%)	$2.11
Green Energy Adjustment (0.0063 per kWh)	$1.70
State Surcharge (0.00029 per kWh)	$0.08
Electric Usage Charge	$36.09
Fixed Monthly Amount	$5.00
Greenhouse Gas Adjustment (-0.0001 per kWh)	$(0.01)
Capital Infrastructure Adjustment (0.0028 per kWh)	$0.74
MID Cares 23.1% Discount	$(8.34)

Total Current Charges Due by APR 22, 2013 $37.37

- Getting Started
- Your Account
- Your Bill
  - Check Your Bill
  - Bill Costs Explained
  - Sample Bill
  - View Past Bills
- Payments
- Your Profile

MID Online Services Help Guide

Sample Bill

Page 1 of 2

Modesto Irrigation District

1231 ELEVENTH STREET
P.O. BOX 5355
MODESTO, CA 95352-5355
(209) 526-7337

STATEMENT DATE: 03/30/2012
CUSTOMER NAME: Splasher the Frog
SERVICE LOCATION: 123 Modesto Rd, Modesto
SERVICE START DATE: 1/1/12
LOCATION NUMBER: 98765432
ACCOUNT NUMBER: 01234567890
ACCOUNT BALANCE: $ 569.75

CURRENT BILL DUE BY: 04/19/2012

SERVICE PERIOD FROM: 02/24/2012 TO: 03/23/2012
NEXT READ DATE: 04/22/2012

GS1 Rate Active 10/01/2011
First 100,000 Per kWh $0.1278
Effective for: 29 days

Meter Number: 1
Prior Meter Read: 80015 Current Meter Read: 84418 Multiplier: 1 Usage: 4403 KWH

Current Charges

Fixed Monthly Amount	$	18.00
Electric Usage Charge		562.70
Public Agency Discount		56.27 CR
Green Energy Adjustment (0.0073 per kWh)		31.23
Greenhouse Gas Adjustment (0.0004 per kWh)		1.76
Capital Infrastructure Adjustment (0.0028 per kWh)		12.33

Account Activity As of: 03/28/2012

Total Current Charges			$	569.75
Previous Balance				592.16
Payment	03/13/2012	**THANK YOU**		592.16 CR

AMOUNT DUE $ 569.75

Payments and adjustments received after 03/28/2012 will appear on your next bill.
Low Income 23% Discount sign-up assistance available 1st Friday of every month - MID lobby. Bring last bill & proof of income.

This Year: 4,403 kWh, 29 days, Avg kWh per day 151.83
Last Year: 5,185 kWh, 33 days, Avg kWh per day 157.12

PLEASE KEEP THIS SECTION FOR YOUR RECORDS. FOR CUSTOMER INFORMATION SEE REVERSE SIDE

Modesto Irrigation District

ACCOUNT NUMBER	CURRENT BILL DUE ON PRESENTATION AND PAST DUE AFTER	AMOUNT DUE PLEASE PAY
01234567890	04/19/2012	$ 569.75
	ANY PAST DUE AMOUNT MAY BE DELINQUENT	IF DIFFERENT AMOUNT PAID PLEASE INDICATE

PLEASE DETACH AND RETURN THIS PORTION WHEN PAYING BY MAIL

P.O. BOX 5355
MODESTO, CA 95352-5355

901100000250001866040000056975

Splasher the Frog
123 Modesto Rd
Modesto CA 95354-0701

03/30/2012 6:15:46 AM ?Sequence?

- Getting Started
- Your Account
- Your Bill
  - Check Your Bill
  - Bill Costs Explained
  - Sample Bill
  - View Past Bills
- Payments
- Your Profile

MID Online Services Help Guide

Past Billing Periods

You can view past billing statements on the Account Summary, Electric Usage, and Bill Summary screens.

To view past billing dates:

Click the Statement Date arrow to open the drop-down menu
Select a date to reload the current page with that bill's data

Statement Date Jan-31-12
- Jan-31-12
- Jan-02-12
- Nov-30-11

- Getting Started
- Your Account
- Your Bill
- Payments
  - Making a Payment
  - Confirm Payment Success
- Your Profile

MID Online Services Help Guide

How to Make a Payment

Before making a payment, you must create a payment account.

Navigate to: Payments > Pay Your Bill

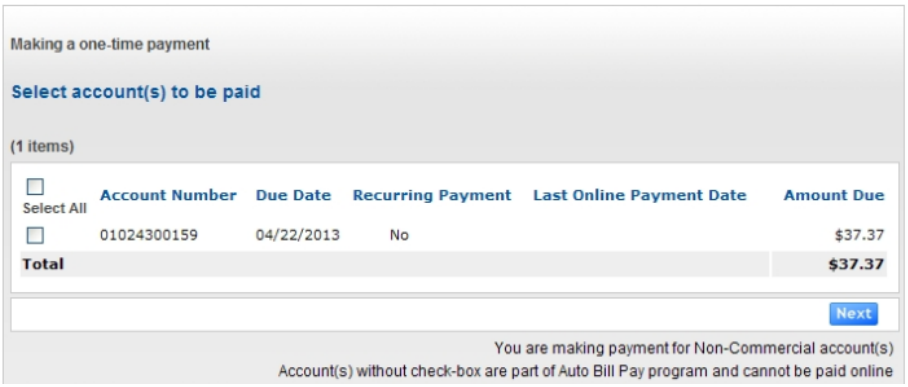
Step 1: If the account has both residential and commercial accounts:

- select the type of account to make a payment on
- click Next

If the account has only residential or commercial accounts, proceed to Step 2.

Step 2: Select the account(s) to make a payment on.

Tip: Check the box in the top left to select all accounts.



- Getting Started
  - Your Account
  - Your Bill
  - Payments
- Your Profile
  - Change Personal Information
  - Email Notifications
  - Add an Electric Account to MID Online
  - Manage Multiple Accounts

MID Online Services Help Guide

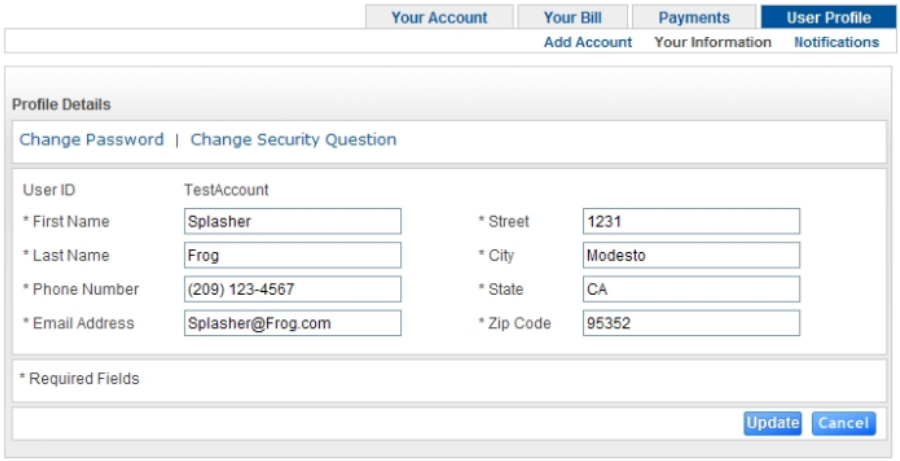
Changing Personal Information

You can change personal information, your password, or your security question and answer from the User Profile section.

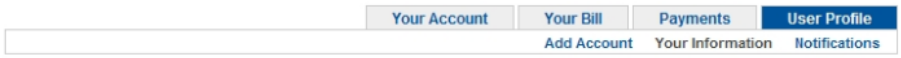
Click "User Profile" to display your profile details. You can update:

- First Name
- Last Name
- Phone Number
- E-mail Address
- Street
- City
- State
- Zip Code

Click "Update" to save your changes.



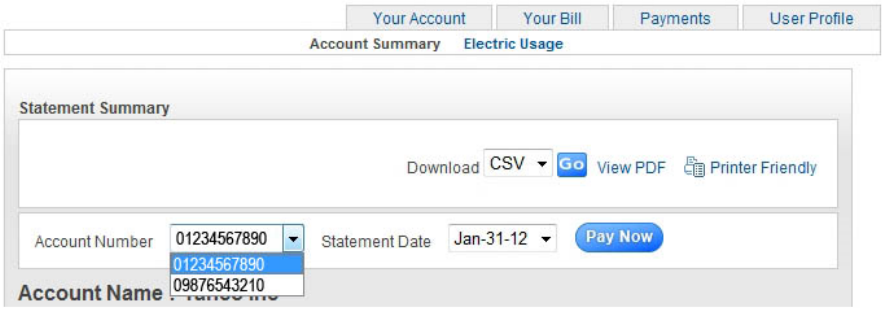
After changing your information and clicking update, you will see the page reload with a green box.



Getting Started
Your Account
Your Bill
Payments
• Your Profile
Change Personal Information
Email Notifications
Add an Electric Account to MID Online
Manage Multiple Accounts

MID Online Services Help Guide

Manage Multiple Accounts with MID Online

Switch between your connected electricity accounts by clicking the Account Number drop down box arrow and selecting the a different account number. The page will reload with the new account's information. Everything functions the same, but the information displayed is of the other account. You can switch between accounts by selecting a different account number.

See also: Add an Electric Account to MID Online