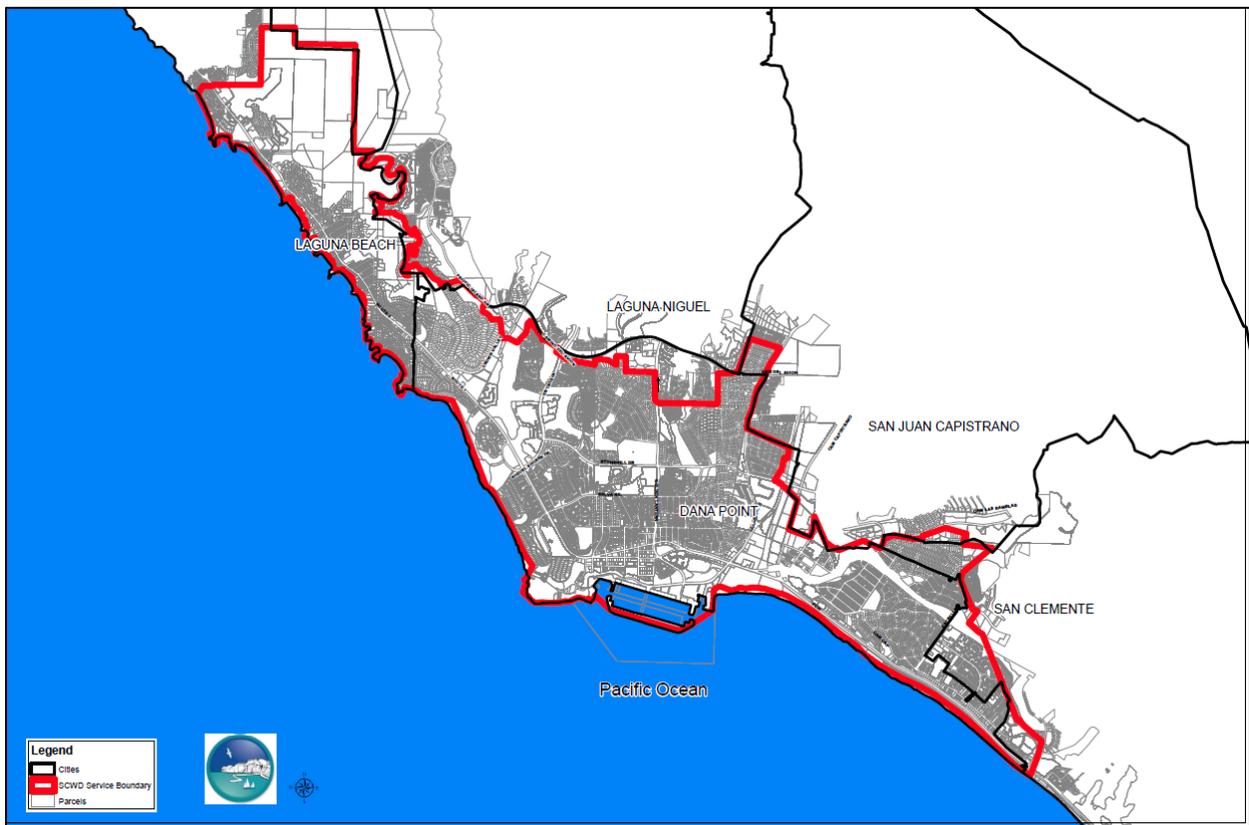


Advanced Metering Infrastructure Implementation Program Phase 1 Project

Laguna Beach, CA

Final Project Report



Agreement #R17AP00126
South Coast Water District
31592 West St
Laguna Beach, CA 92651-6908
November 7, 2019

**AMI Implementation Program Phase 1 Project Final Report
South Coast Water District Agreement #R17AP00126**

1. Recipient Information:	
Recipient Name: (Name, contact person, address and phone number)	South Coast Water District Cassandra Garcia, Customer Service Manager 31592 West ST Laguna Beach, CA 92651-6908 (949) 499-4555 ext. 3144; cgarcia@scwd.org
Agreement Number:	R17AP00126
Project Name:	Advanced Metering Infrastructure Implementation Program Phase 1 Project
Date of Grant Award:	September 17, 2017
Estimated Completion Date	September 30, 2019
Actual Completion Date:	September 26, 2019

Table 1. Final Funding Information

2. Final Funding Information	Funding Amount
Non-Federal Entities	
1. South Coast Water District	\$678,456.67
<i>Non-Federal Subtotal:</i>	\$678,456.67
Other Federal Entities	
1. None	
<i>Other Federal Subtotal:</i>	\$0
<i>Reclamation Funding Paid:</i>	\$299,000.00
<i>Total Project Funding:</i>	\$977,456.67

3. One paragraph Project Summary (Project Goals/ Objectives): *Briefly describe the goals/objectives of the project/ activity as they were identified in the original executed agreement*

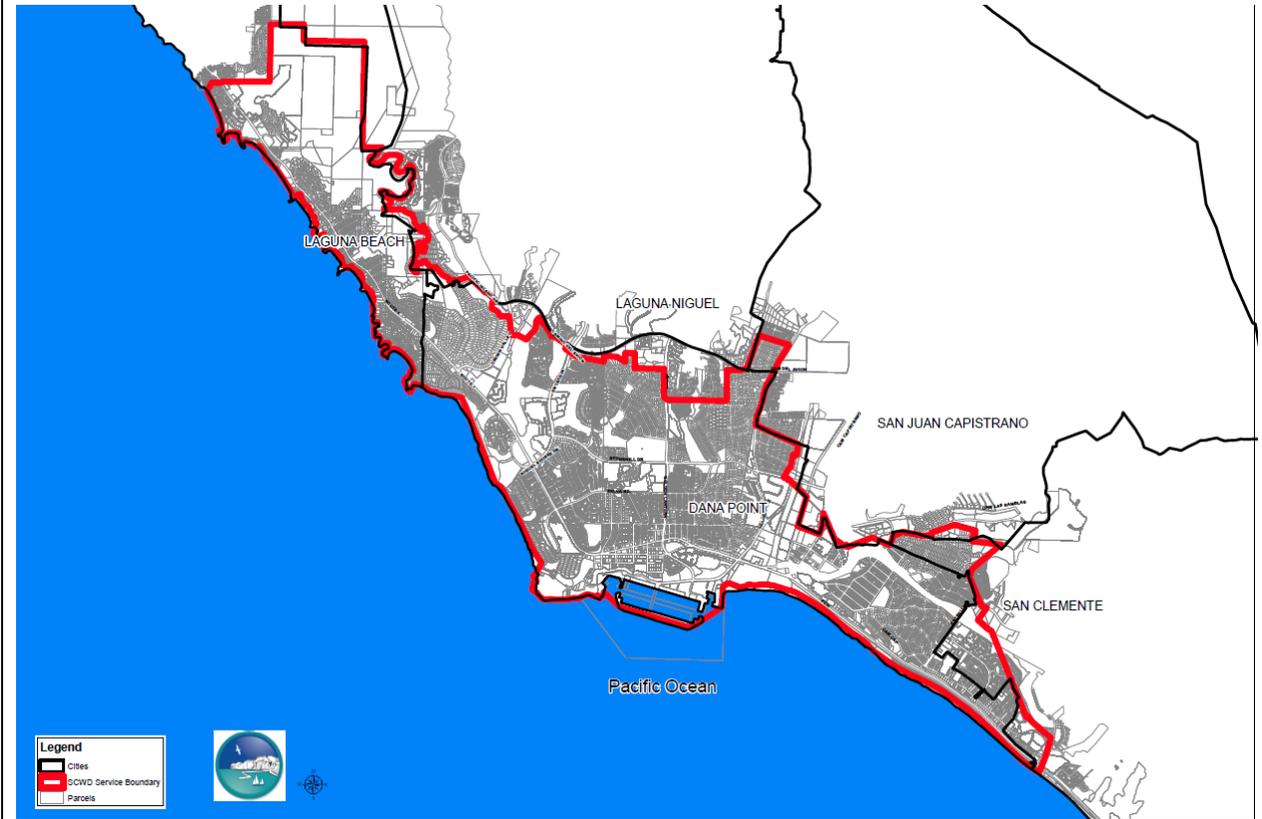
The Advanced Metering Infrastructure Implementation Program Phase 1 Project (Project) goals/objectives in the original executed agreement were: (A) to conserve water and (B) to increase water use efficiency. The Project will convert remove and replace 3,008 existing meters to an advanced system that uses telecommunications to deliver real-time data (advanced metering infrastructure or “AMI”). This data will be available to the consumer and the South Coast Water District (District) for planning and implementing an adaptation strategy. This is in line with the findings of Reclamation’s WaterSMART Colorado River Basin Water Supply and Demand Study. The Project is expected to result in annual water savings of 90 acre-feet.

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4. Final Project Description: *Briefly describe each element of the scope of work that was identified in Section I.5 of the Agreement, and the work that completed at each stage of the project. Please include maps, sketches, and/or drawing of the features of the completed project, as appropriate. In addition, please describe any changes that were made to the scope of the project that was identified in the original Agreement.*

The Project included converting 3,008 manual read meters to Advanced Metering Infrastructure (AMI) meters with an online customer portal that can automatically collect and store hourly consumption data and provide real-time updates. This was done through a cellular network. Phase 1 is expected to result in annual water savings of 90 acre-feet per year (AFY), 252,000 kilowatt hours per year (kWh/year), and 157,797 pounds of CO₂ per year. Furthermore, deployment of the software, a Customer Portal, allows water users with online access to view their own real-time hourly water usage data. The Project implements adaptation strategies that were identified in the completed Reclamation WaterSMART Colorado River Basin Water Supply and Demand Study. This Project is a phase of the Recipient's long-term goal of water supply reliability and efficient water management. Although the original agreement proposed installing meters in the following milestone amounts 900 meters, 1,200 meters, and 908 meters; the actual Project implementation was completed at 900 meters, 1,900 meters, and 208 meters. Project progress was tracked with semi-annual reports prepared based on milestones of meters installed. After review of the methodology used to estimate water conservation savings, consideration of the supporting documentation provided by the District, and adjustments made during the evaluation of the Project, it is estimated that the Project will result in annual water savings of 90 acre-feet. The meters were installed throughout the District's Service Boundary; therefore, a map of the South Coast Water District Service Boundary is shown in Figure 1 below. Additional images of the Customer Portal Features are included in Figures 2-7 in subsequent pages. No major changes to the scope of the Project were made; 3,008 meters were installed/replaced. Only a slight change occurred in November 2018, when the District realized that some areas required antenna ready meter box lids for cellular reception. The District utilized meter box antenna ready meter lids for the remainder of the project. In July 2019, the District realized that some meter registers did not pick up meter reading. The Meter vendor was contacted and provided the District with the register replacements. Meter reading was successful after the antenna ready meter box lids were used and the register replacements on some were completed.

Figure 1. SCWD Service Boundary Map and Project Location



5. Accomplishment of Project Goals: *Describe whether the project goals/ objectives, identified in Section 2- Project Goals/ Objectives, above, were achieved through the completion of the project. If applicable, please state the reasons why goals/ objectives were not met, and describe any problems or delays that were encountered in completing the project. Additionally, please indicate whether or not the project was completed within the cost outlined in the original Agreement.*

The project goals/objectives there were achieved through the completion of the project included the Milestone Goals and Scope of Work identified in the Agreement, which include the following:

1. Environmental Compliance achieved through a Categorical Exclusion (CE) or Finding of No Significant Impact (FONSI) under NEPA was issued by Reclamation given the nature of the Project that includes simply replacing existing Badger meters with upgraded AMI meters.
2. Procure Equipment installed as part of the AMI Project included 3,008 AMI water meters and registers.
3. Installation of Communication System.
4. Removing and Replacing 3,008 Meters with AMI Technology

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The Project was completed within the cost and the schedule outlined in the original agreement. As shown in Table 1 and Table 2 in this report, the final total Project cost was below the estimated budget because the AMI meter costs varied by size and costs were lower than anticipated.

6. Discussion of Amount of Water Conserved, Marketed or Better Managed: *In responding to the questions set forth below, Recipients should rely on the best data or information available. Actual field measurements should be used whenever possible (e.g., baseline data or post-project data derived from measuring devices, diversion records, seepage tests, etc.) Where actual field measurements are not available, water savings (or amounts marketed or better managed) may be estimated based on studies, other similar improvement projects, or anecdotal evidence.*

A. Recipient's total water supply (average, annual, available water supply in acre-feet per year):

The District's current total water supply is 5,071 AF annually.

B. Amount of water conserved, marketed or better managed as a result of the project (in acre-feet per year):

90 AFY

C. Describe how the amounts stated in response to 6.B were calculated or estimated:
In responding to this question, please address (1) – (3) below.

(1) Describe the information/data being relied on to calculate/estimate the project benefits. State how that data/information was obtained, if appropriate. Provide any other information necessary to explain how the final calculation/estimate of project benefits was made.

Amount of average water saved/conserved (AFY) for Proposed Phase 1 AMI Project:
(Water Loss Reduction + Reduction in Consumption)

8.6 + 81 AFY = 89.6 AFY or **approximately 90 AFY of water saved by proposed Phase 1 AMI Project.**

Detail and supporting calculations for estimate:

Water loss reduction for Proposed Phase 1 AMI Project:

Water Use for 3,008 meters identified is 777 AFY for FY 2016.

Current 2.1% Water Loss will be reduced by 1%= 1.1% Water Loss Savings

Estimated Water Savings from Phase 1 AMI Project implementation = 777 AFY*1.1% = **approximately 8.6 AFY water saved.**

The AMI Project will achieve water savings by implementing the following: 1) More rapid identification and correction of water leaks (currently meters are read every month allowing leaks to go undetected and water to be wasted for a month before being noticed), 2) More

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accurate meter readings compared to aging meters (half the District's meters are at replacement age and are likely erroneously registering lower water use than actual water use), and 3) Reduced potable water usage based on customer education through the AMI Project's data on water usage.

Empirical data demonstrates that customer portals help improve water use efficiency and reduce consumption by up to five percent. Other water agencies that have installed AMI have been able to reduce water losses down to nearly one percent. The District has estimated that the AMI Project will reduce water losses from 2.1% down to 1%, saving approximately 8.6 AFY.

Savings will also result from the deployment of a Customer Portal, through which customers for all AMI units will be able to independently access their own real-time flow data on the District's website. These additional water savings will come from self-leak detection and water use behavioral change on the part of customers who access the data for the purpose of monitoring their consumption. Eastern Municipal Water District (EMWD), which is a wholesaler of water in Southern California, recently implemented a demonstration project, which included implementation of a Customer Portal similar to the proposed AMI Project. For EMWD's demonstration project, they installed AMI units for a subset of their customer base, included daily water use information on their water bills, and made flow data available to customers on their website. EMWD determined that an average annual savings of 0.027 AF per meter was realized through implementation of their project. Since the District's proposed AMI Project includes these same activities, it is anticipated that this same level of savings can be achieved at a minimum for all of the District's AMI units. Therefore, applying the same savings of 0.027 AFY/meter to the proposed Project results in the following calculation:

Customer Portal Reduction in Consumption for Proposed Phase 1 AMI Project:
0.027 AFY/meter * 3,008 meters = approximately **81 AFY** water saved through the Customer Portal.

Therefore, total water savings for the Phase 1 AMI Project is 8.6 AFY + 81 AFY = 89.6 AFY.

(2) As appropriate, please include an explanation of any concerns or factors affecting the reliability of the data/information relied on.

There are no concerns.

(3) Attach any relevant data, reports or other support relied on in the calculation/estimate of project benefits, if available. Please briefly describe the data/information attached, if any.

The Customer Portal has proven successful in identifying and resolving water leaks quickly. Customers can sign up for leak or high use alerts, whereby they receive an email with a leak detection notification. For example, an alert came in by email for 35131 Camino Capistrano. The customer was able to troubleshoot to find and fix the leak and they found a leak in their irrigation system that caused a spike in water usage. This specific leak detection email notification feature is shown in Figure 7 of this report.

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D. Use of Conserved Water: *Please explain where the water saved, better managed, or marketed as a result of the project is going (e.g. used by the recipient, in stream flows, available to junior water users, etc.*

The water better managed is available to remain in the State Water Project (Bay-Delta) and Colorado River Aqueduct.

E. Future tracking of project benefits: *Please state whether and how the Recipient plans to track the benefits of the project (water saved, marketed or better managed) in the future. If no actual field measurements are currently available to support the estimate of project benefits in 6.B., please state whether actual field measurements will become available in the future. If so, please state whether the Recipient is willing to provide such data to Reclamation on a voluntary basis once it is available.*

Project progress can be tracked with a report based on the 3,008 meters installed. The Project can produce consumption data reports from the Computer Information System. The first consumption data report comparison can be provided by 11/30/19 for all 3,008 meters. The District is willing to provide water savings data to Reclamation on a voluntary basis if requested.

7. Describe how the project demonstrates water efficiency, collaboration, stakeholder involvement or the formation of partnerships, if applicable: *Please describe the collaboration involved in the project, and the role of any cost-share or other types of partners. If there were any additional entities that provided support (financial or otherwise) please list them.*

The Project demonstrates water efficiency by saving 90 AFY of potable water for irrigation uses. Implementing the AMI meters and customer portal results in water conservation and reduced leaks, totaling 90 AFY in water saved. Collaboration was achieved through public outreach with their customers to educate them about the customer portal and real-time water usage information.

8. If applicable, please describe any other pertinent issues regarding the project:

There are no other pertinent issues to report.

9. Feedback to Reclamation regarding the WaterSMART Program:

The email communication from Reclamation was valuable. The District appreciated receiving notifications/email reminders when the semi-Annual and final reports were due. The process was very streamlined and made completing the Project efficient.

10. Attachments: *Please attach the following*

Any available data or information relied on in responding to paragraph 7, above;

- (1) A map or illustration showing the location of the recipient's facilities (see paragraph 4, above);**

The meters were installed throughout the South Coast Service Boundary; therefore, a map of the South Coast Water District Service Boundary is shown as Figure 1. above in question #4. In addition, Figure 9. below shows the locations where the AMI meter were installed.

- (2) Maps, sketches, and/or drawings of the features of the completed project, as appropriate (see paragraph 5, above);**

Figure 2. below shows the Customer Portal Features and Figures 3-6 show what the customers now see when they log into the Customer Portal, including water consumption by Month, Day, Hour, and Minute. In addition, the Customer Portal allows a customer to sign up for leak or high use alerts and an example of this is provided in Figure 7, which shows the email that was sent out notifying a customer of a leak alert. The leak was quickly fixed and the issue was resolved due to the Customer Portal Leak Notification email alert system implemented through this project.

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Figure 2. Customer Portal Features (Completed Project)

EyeOnWater: Making Water Visible.™

Page 1 of 1

EyeOnWater

9999 SCWD AVE
LAGUNA BEACH, CA
Account Number: 11538300
Meter ID: 17031187

Customers can receive leak notifications

Leaks



No leak detected. Great job!

Edit Leak Alert

Customers can view gallons used in the last 7 days and more

At a Glance



208% Increase

613

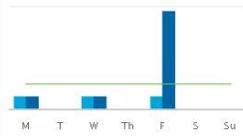
Last 7 days
Gallons

199

Previous 7 days
Gallons

124

30 Day Average
Gallons



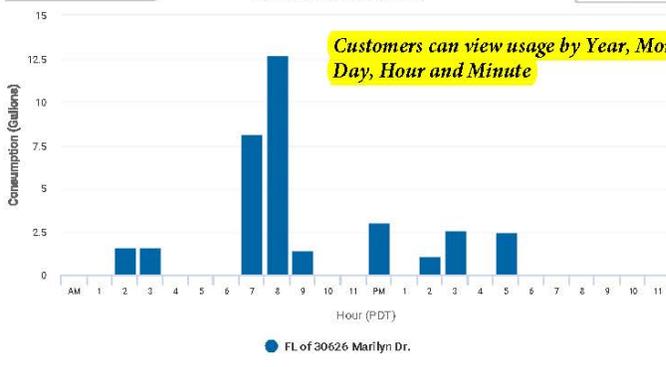
Customers can download usage to pdf or excel

Total 35 Gallons

Minute Hour Day Month Year
Today
Print Bar Globe

▼ Print/Download ▼ More Options

Tuesday, October 08, 2019



Export Data 

Customers can view usage by Year, Month, Day, Hour and Minute

Your Meter



Your meter measures the quantity of water used in your household. Flow is measured electronically at hourly intervals, and updated every 24 hours for billing and leak detection.

Read Frequency
Daily

Meter Read
3:44 PM on Oct 27
200.86949 CCF

Next Update
3:46 PM on Oct 28

Powered by Badger Meter, Inc.

Legal

<https://eyeonwater.com/dashboard/>

10/28/2019

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Figure 3. Customer Portal Water Consumption by Month (Completed Project)

EyeOnWater: Making Water Visible.™

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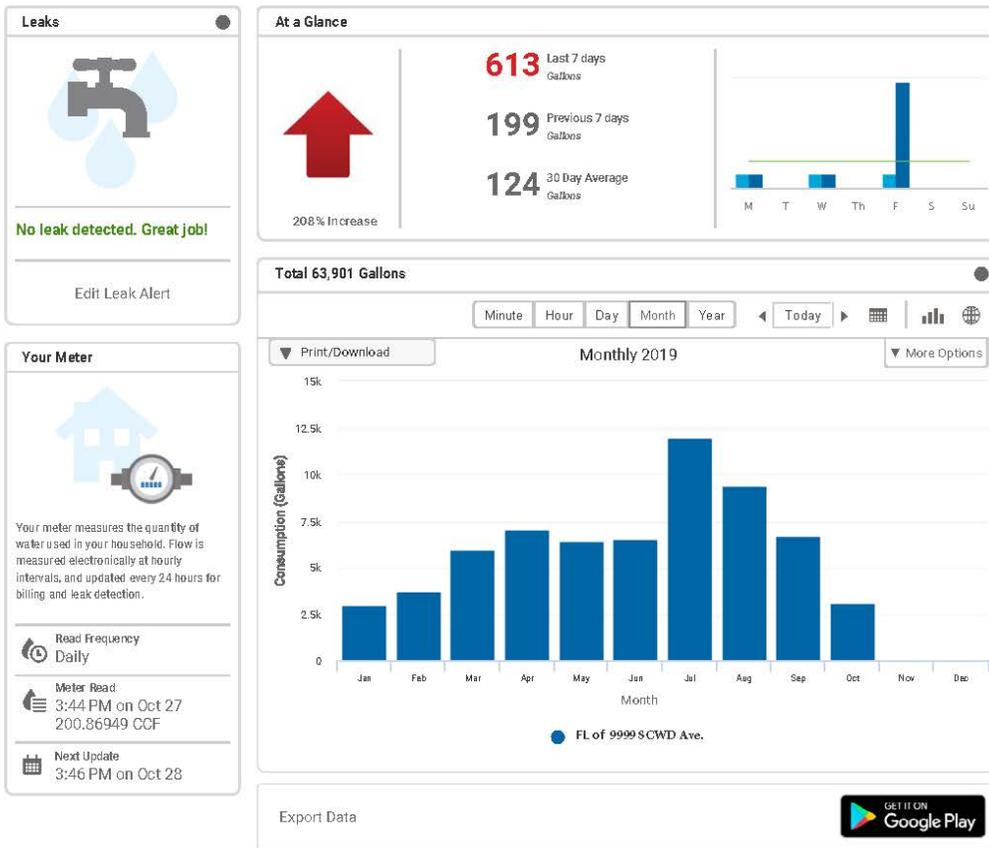
(These next four pages depict water consumption detail from the customer portal.)

EyeOnWater

WATER CONSUMPTION BY MONTH

9999 MARILYN DR
LAGUNA BEACH, CA
Account Number: 99998300
Meter ID: 17039999

[Link More Accounts](#)



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Figure 4. Customer Portal Water Consumption by Day (Completed Project)

EyeOnWater: Making Water Visible.™

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EyeOnWater

WATER CONSUMPTION BY DAY

9999 SCWD AVE
LAGUNA BEACH, CA
Account Number: 99998300
Meter ID: 17039999

[Link More Accounts](#)

Leaks



No leak detected. Great job!

[Edit Leak Alert](#)

At a Glance

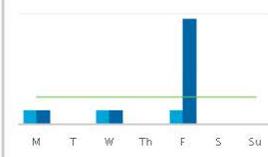


613 Last 7 days
Gallons

199 Previous 7 days
Gallons

124 30 Day Average
Gallons

208% Increase



Day	Consumption (Gallons)
M	~50
T	~50
W	~50
Th	~50
F	~50
S	~50
Su	~50

Your Meter

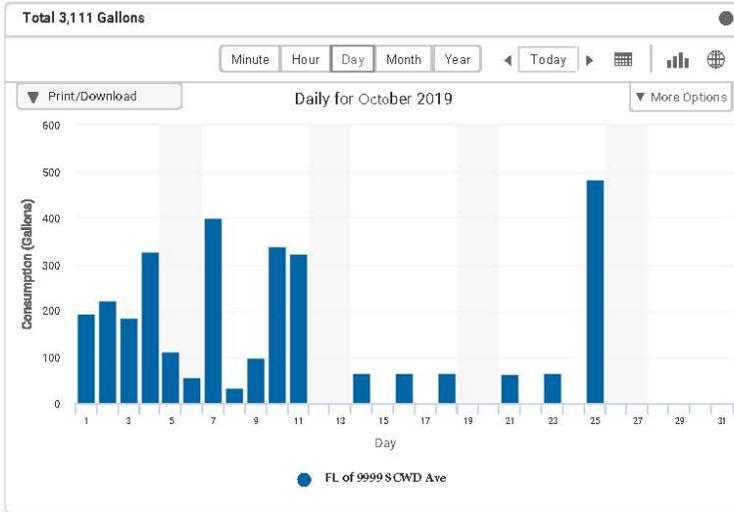


Your meter measures the quantity of water used in your household. Flow is measured electronically at hourly intervals, and updated every 24 hours for billing and leak detection.

Read Frequency
Daily

Meter Read
3:44 PM on Oct 27
200.86949 CCF

Next Update
3:46 PM on Oct 28



Export Data



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Figure 5. Customer Portal Water Consumption by Hour (Completed Project)

EyeOnWater: Making Water Visible.™

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EyeOnWater

WATER CONSUMPTION BY HOUR

9999 SCWD AVE
LAGUNA BEACH, CA
Account Number: 99998300
Meter ID: 17039999

[Link More Accounts](#)

Leaks



No leak detected. Great job!

Edit Leak Alert

Your Meter



Your meter measures the quantity of water used in your household. Flow is measured electronically at hourly intervals, and updated every 24 hours for billing and leak detection.

Read Frequency
Daily

Meter Read
3:44 PM on Oct 27
200.86949 CCF

Next Update
3:46 PM on Oct 28

At a Glance



208% Increase

613

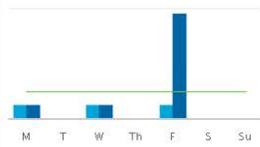
Last 7 days
Gallons

199

Previous 7 days
Gallons

124

30 Day Average
Gallons

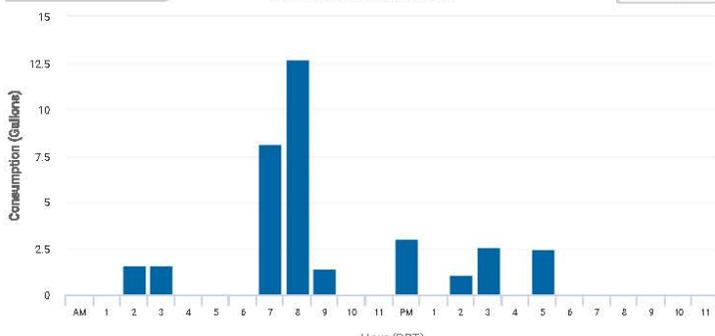


Total 35 Gallons

Minute Hour Day Month Year Today

Tuesday, October 08, 2019

Print/Download More Options



Hour (PDT)

● FL of 9999 SCWD AVE.

Export Data



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Figure 6. Customer Portal Water Consumption by Minute (Completed Project)

EyeOnWater: Making Water Visible.™

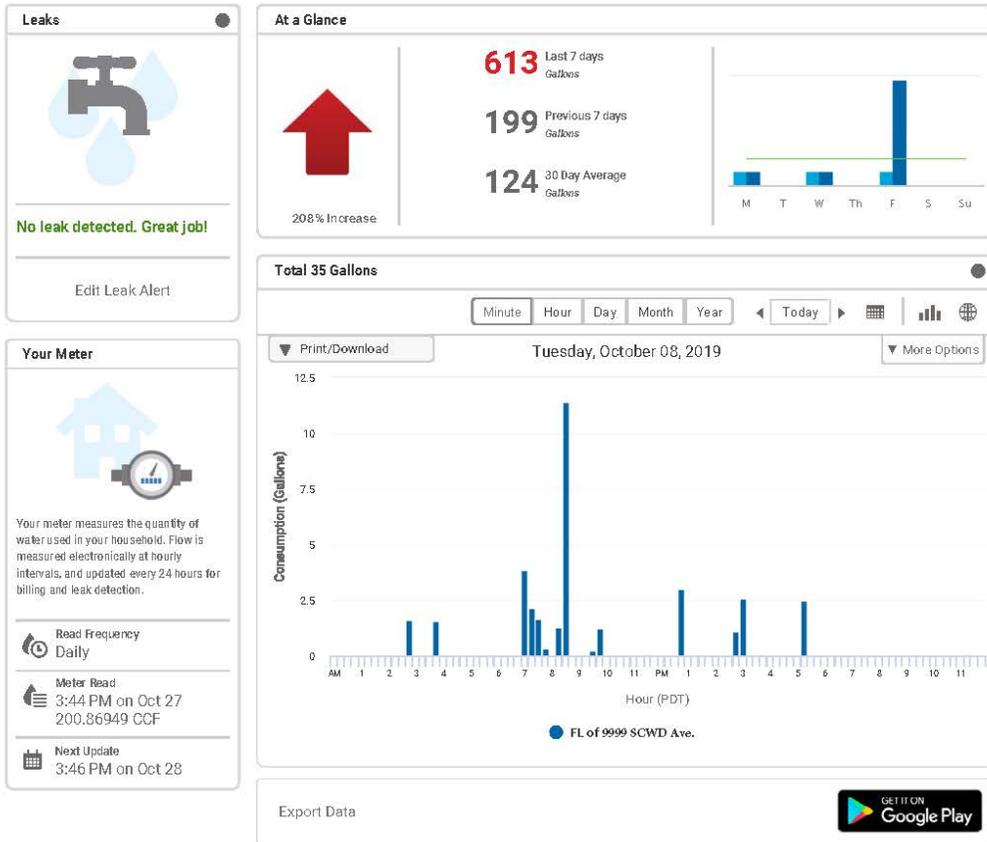
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EyeOnWater

WATER CONSUMPTION BY MINUTE

9999 SCWD AVE
LAGUNA BEACH, CA
Account Number: 99998300
Meter ID: 17039999

[Link More Accounts](#)



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Legal

NOTE: The usage information on all usage documents is from an actual customer address at the District. The actual account address, and meter have been hidden with 9999 numbers.

Figure 7. Leak Detection (Completed Project)

-----Original Message-----

From: alerts-noreply@beaconama.net <alerts-noreply@beaconama.net>

Sent: Tuesday, October 1, 2019 4:28 AM

To: CustomerEmail

Subject: Leak Alert for FC of 35131 Camino Capistrano 18482048
[Reminder]

Location: FC of 35131 Camino Capistrano, 35131 CAMINO CAPISTRANO
Meter: 18482048

In the past 24 hours, BEACON has detected base flow of 22.4 GAL/hour
which still exceeds the maximum threshold of 1.0 GAL/hour.

-----Original Message-----

From: alerts-noreply@beaconama.net <alerts-noreply@beaconama.net>

Sent: Tuesday, October 2, 2019 10:31 PM

To: CustomerEmail

Subject: Leak Alert for FC of 35131 Camino Capistrano 18482048 [Stop]

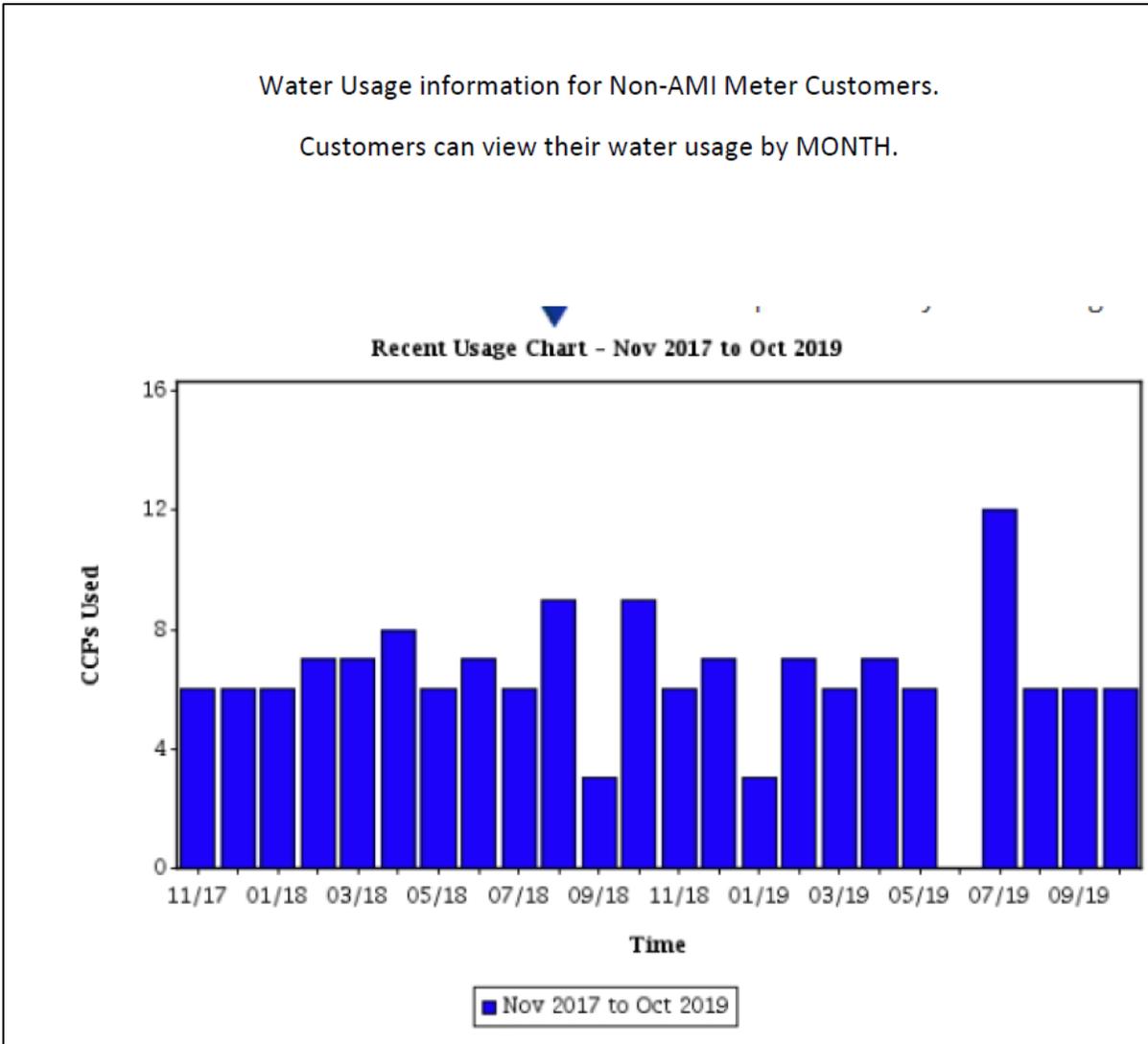
Location: FC of 35131 Camino Capistrano, 35131 CAMINO CAPISTRANO
Meter: 18482048

Leak has stopped.

(3) Representative before and after photographs, if available;

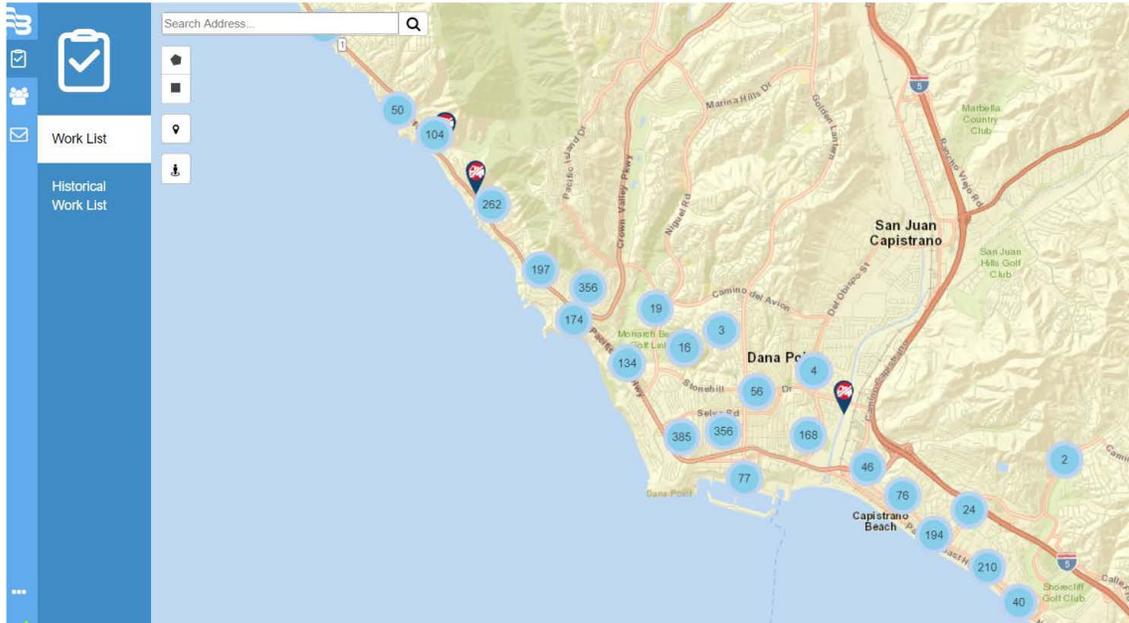
Figure 8. below is an image of the graph that customers saw before Project implementation, without AMI meters. It is a graph of monthly usage only. The graph also demonstrates the Customer Usage before the Customer Portal was implemented through the Project. Figures 2-7 shows the completed project (after implementation). Figure 9 below is a map that shows the before and after location areas where meters were removed and replaced with AMI Meters.

**Figure 8. Water Usage Information for Non-AMI Meter Customers
(Before Project)**



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Figure 9. AMI Meter Implementation Project Locations (After Project)



(4) A table showing the total expenditures for the completed project.

Table 1, appearing earlier in this report shows final expenditures. Table 2, below, shows the estimated project costs from the funding agreement, whereas Table 3 below shows the final costs of the Project, including lower unit costs and total costs than estimated in the agreement. This is because the AMI meter costs varied by size and costs were lower than anticipated.

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Table 2. Estimated Project Costs (From Agreement)

BUDGET ITEM DESCRIPTION	COMPUTATION		Quantity Type	BUDGET TOTAL COST (Estimated)
	\$/Unit	Quantity		
Supplies and Materials				
AMI Water Meters	\$426.48	3008	Meters	\$1,282,852
Other				
Environmental Compliance Costs	\$1,000.00	1	LS	\$1,000.00
TOTAL PROJECT COSTS				\$1,283,852

Table 3. Actual Project Costs (Completed Project)

BUDGET TOTAL COST (Estimated)	COMPUTATION		Quantity Type	ACTUAL TOTAL COST
	\$/Unit	Quantity		
Supplies and Materials				
AMI Water Meters	\$324.95	3008	Meters	\$977,456.67
Other				
Environmental Compliance Costs	\$1,000.00	1	LS	\$1,000.00
TOTAL PROJECT COSTS				\$978,456.70