

# EBMUD Commercial Irrigation Programs



- LAC meeting
- July 23, 2018



- EBMUD – Commercial WELO Landscapes using water efficiently?
- EBMUD Water Budgets, Audits, Rebates, CIMIS, and Success Story Web page.

# Creative Water Management ...





# Post 2010 WELO – Type Landscapes. *Big Changes...*



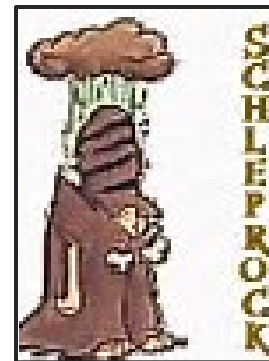
- DWR 2010 AB  
1881 Model Water  
Efficient Landscape  
Ordinance
  - 490 Purpose
    - (b) (4) *“Use water efficiently without waste by setting a Maximum Applied Water Allowance as an upper limit for water use and reduce water use to the lowest practical amount”.*



# New commercial landscapes guarantee water savings...



- *Dave ruins everything...*
- *So far, very few seem to be using water efficiently in the new post 2010 commercial landscapes*



# Post 2010 – WELO Type Landscapes. *Using Water Efficiently?*



- (86) Commercial Water Budget (irrigation only metered) properties. 2010-2014.
  - **ALL Billing periods.**
  - 2016/2017 calendar years evaluated. *Actual* consumption versus budget.
  - Plant material had at least 2 years of establishment.
- Consumption **176%** of Budgeted amount for 969 total budgets.
- **68 (79%)** properties had consumption exceed budget over this two year period.
  - Budget based on 80% of ET for pre 2010 customers.
  - Budget adjusted to 70% of ET post 2010.
  - Budget adjusted to 45% of ET post 2016.





# Barriers... Knowledge of “End User”



# Barriers... Information




- Does Property or Facility manager ..
  - Receive actual water bill.
  - Receive water budget report.
- Many commercial properties billed to companies out of the area or state.

EAST BAY MUNICIPAL UTILITY DISTRICT

**water SMART** Maximum Allowable Water Budget

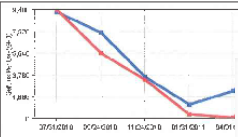
"Thank you for participating in our Landscape Irrigation Water Budget Program. The following is your customized water usage profile for the past two years. EBMUD records indicate that this account primarily serves landscape irrigation. The graph compares your measured water usage to your budgeted water usage for each billing period.

Customer Name	Gardens of Watertown HOA	
Service Address	1000 Winding Ct.	
City	Watertown	
Account #	123456789000	
Meter #	12345678	
Est. Irrigated Area	62,839	



Used: 2,361,436 | Budget: 3,283,513 | Percent: 72%


Congratulations—meeting your water budget saved you \$3,682.



Billing Period	7/1/16	9/30/16	11/30/16
Budget(GPD)	2205	7/28	3631
Consumption(GPD)	9400	5671	3397
Evapotranspiration(ET)	14.1	0.41	5.65

\*ET represents the estimated water need of local plants and grass. It is calculated based on local weather data and is not accurate for all areas. Irrigation systems can be tuned off for the Maximum Water Budget, which on January 22, 0, is calculated based on the new Model Efficient Landscape System. The irrigated area is not accurate or would like more information.

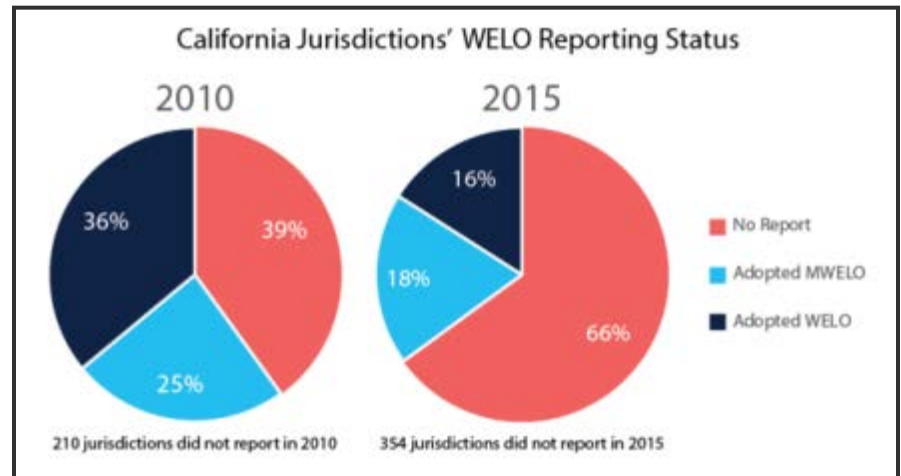
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# Barriers.... Implementation



- Who locally implements WELO?
  - “Local Agency” means a City/County that is responsible for adopting and implementing the ordinance.
  - National Resource Defense Council (NRDC)





# Maintenance and Scheduling concerns...Drip Irrigation / Bubblers



- Drip Irrigation is not for everybody !!!.
- How fast is water being applied?
  - How many minutes?
  - How many days?



## Bubblers?

- “Fixed rate” (0.25 - 0.50) gallons per minute.
- Adjustable Bubblers.... ???



# Where's the waste??

- This is what 10,000 GPD (Gallons per Day ) can look like – actually happened.
- Valves “stick” or are manually opened.
- Very common...





# Suggestions...

- Contact CUSTOMER (end user) directly.
  - Create document explaining what a WELO designed landscape and irrigation system is.
  - Provide clear information stating that once established, this landscape requires minimal irrigation.
  - Revisit some landscape design elements.
    - Avoid possible hazards to public.





# EBMUD Commercial Water Budget Report 2017



- Water Budgets reviewed daily.
  - 4,100 total accounts (meters) in program.
  - 60 to 70 budgets produced daily on average.
  - Over 23,000 budgets sent to customers.
- Automatically emailed to customers.
  - Over 300 High consumption alerts manually sent to customers.

**EAST BAY MUNICIPAL UTILITY DISTRICT**

**water SMART** Recommended Water Budget

Thank you for participating in our Landscape Irrigation Water Budget Program. The following is your customized water usage profiles for the last two years. EBMUD records indicate that this account primarily serves landscape irrigation. The graphical description compares your measured water usage versus your budgeted water usage for each billing period.

Customer Name: City Of San Ramon  
Service Address: 90 Alisma Ct  
City: San Ramon  
Account #: 5486960001  
Meter #: 16027494  
Est. Irrigated Area(sq. ft): 48303

Water Budget Summary	Used	Budgeted
Gallons used last 12 months	68,160	1,060,535
Gallons used previous year	492,344	1,132,064

Used: 1,120,504 Budget: 2,192,648 Percent: 51%  
Congratulations, meeting your water budget saved you \$ 6,761

**Irrigated Area at 90 Alisma Ct**

Billing Period	04/06/15	06/03/15	08/03/15	10/03/15	12/02/15	02/04/16	04/03/16	06/02/16	08/02/16	10/02/16	12/01/16	01/31/17
Budget(GPD)	2393	3738	5204	4479	2102	858	2007	3831	5169	4224	1610	770
Consumption(GPD)	965	2928	1864	1217	217	58	26	832	4010	4630	1923	12
Evapotranspiration(ET)	6.16	9	13.18	10.97	5.41	2.28	4.75	9.86	13.09	10.17	4.21	1.95

\*ET=Represents the estimated water need of cool season grass (in inches) for each billing period. The Water Budget Calculation does not use rain, typically irrigation systems can be turned off for the winter months of November, December, January, and February. The Maximum Allowable Water Budget, effective January 2010, is calculated using the new Model Efficient Landscape Ordinance from the State of California, Department of Water Resources (DWR). If you feel the irrigated area is not accurate or would like more information on this program, contact EBMUD at (510) 986-7615.

www.ebmud.com/watersmart *We make it easy to conserve.*

# Landscape Water Budgets Post - 2012



Parcels



Aerial Image



Aerial Photo

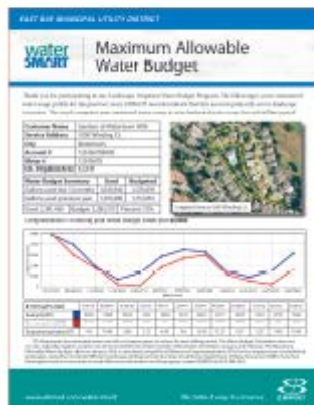


Weather Data



Oracle  
Database

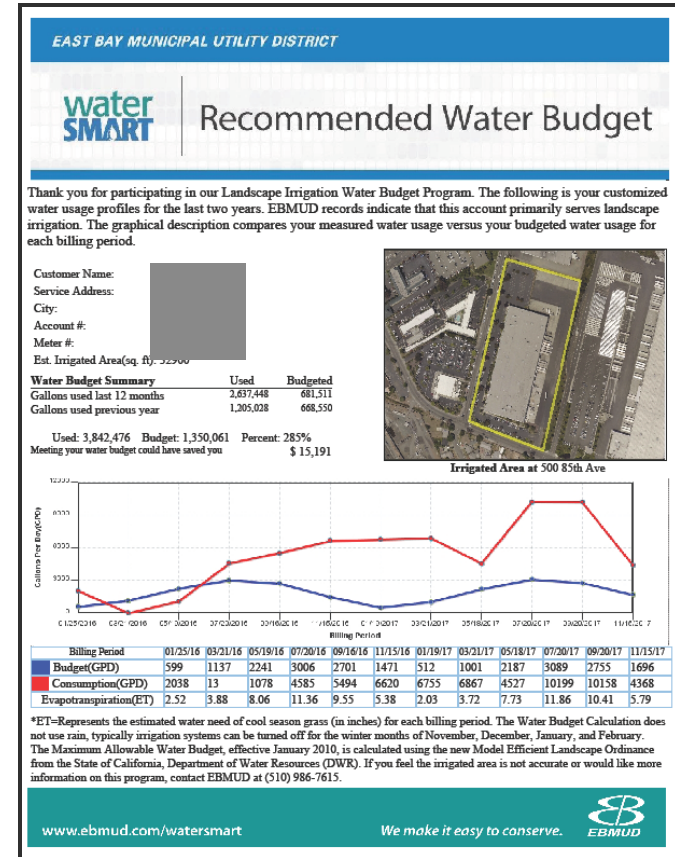
- Free to EBMUD customers
- Over 3,000 customers in program
- 60-70 budgets sent out daily



# 2013 EBMUD Water Budget Report



- Customer Type - (2) specific customers make up the majority of accounts in the program.
  - **All Customers** Consumption was 76% of Budgeted amount.
  - HOA's: 42% of all customers.
    - 31% of total water used.
    - Consumption 77% of budgeted amount.
  - Cities: 32% of all customers.
    - 25% of total water used.
    - Consumption 87% of budgeted amount.
- Budgets also provided for:
  - Office Building, Apartments, Business, and more.





# Water Budget Report



- Informs customers on how efficiently water is being used for the landscaping?
- High Consumption Alerts.
  - Mainline leaks, stuck valves
- Trends.
  - Scheduling, late to adjust.
- “Stuck” meters.
- Past rebate customers.
  - Saving water?

X:) MAWB > 2018 > Mar > 05 > Email-05

Burn New folder

Name

- ALAMO HIGHLANDS HOA\_I
- CASA LEANDRO HOA\_Parce
- CITY OF ALBANY\_Parcel\_55
- CITY OF BERKELEY PARKS &
- CITY OF BERKELEY PARKS &
- CITY OF BERKELEY PARKS &
- CITY OF ORINDA\_Parcel\_516
- CITY OF ORINDA\_Parcel\_55
- CITY OF SAN RAMON\_Parce
- DANVILLE STATION HOA\_P
- EAST BAY REGIONAL PK DIS
- EAST BAY REGIONAL PK DIS
- EAST BLUFF LTD\_Parcel\_170
- EASTGATE HOA\_Parcel\_123
- EBMUD\_Parcel\_171153
- EVERGREEN CEMETERY\_Par
- GREENBROOK HOMES ASSN
- GREENBROOK HOMES ASSN
- GREENBROOK TOWNHOUS
- GREENBROOK TOWNHOUS
- GREENBROOK TOWNHOUS
- GREENBROOK TOWNHOUS
- GREENBROOK TOWNHOUS
- HARBOR BAY I, LLC\_Parcel\_
- HORIZON OWNRS ASSOC, F
- JUPITER INVESTMENTS LLC,
- KAISER FOUND HEALTH PLU
- LANDMARK OAK OWNERS,
- LAUREL LANE HOA\_Parcel\_
- MARQUIS NEIGHBORHOOD
- MAUBERT GARDENS\_Parcel
- MIRA VISTA COUNTRY CLU
- ON THE HILL TOWNHOMES
- PALOMARES HILLS HOA\_Pa
- PALOMARES HILLS HOA\_Pa
- PALOMARES HILLS HOA\_Pa

**EAST BAY MUNICIPAL UTILITY DISTRICT**

**water SMART** Recommended Water Budget

Thank you for participating in our Landscape Irrigation Water Budget Program. The following is your customized water usage profiles for the last two years. EBMUD records indicate that this account primarily serves landscape irrigation. The graphical description compares your measured water usage versus your budgeted water usage for each billing period.

Customer Name: Alamo Highlands Hoa  
 Service Address: 503 Justin Morgan Dr  
 City: Alamo  
 Account #: 54781400001  
 Meter #: 17051545  
 Est. Irrigated Area(sq. ft): 42000

Water Budget Summary	Used	Budgeted
Gallons used last 12 months	1,118,764	983,740
Gallons used previous year	769,692	932,636

Used: 1,886,456 Budget: 1,916,376 Percent: 98%  
 Congratulations, meeting your water budget saved you \$ 183

**Irrigated Area at 503 Justin Morgan Dr**

Billing Period	04/25/16	06/23/16	08/22/16	10/19/16	12/15/16	02/23/17	04/20/17	06/22/17	08/21/17	10/19/17	12/15/17	02/22/18
Budget (GPD)	2339	3979	4472	3033	997	789	2178	4068	4499	3472	1213	981
Consumption (GPD)	673	2662	4613	4320	712	0	0	3055	5111	5337	2565	2434
Evapotranspiration(ET)	6.7	11.21	12.81	8.4	3	2.41	6.24	11.46	12.89	9.78	8.65	2.95

\*ET=Represents the estimated water need of cool season grass (in inches) for each billing period. Calculation does not use rain, typically irrigation systems can be turned off for the winter months of November, December, January, and February. The Maximum Allowable Water Budget, effective January 2010, is calculated using the new Model Efficient Landscape Ordinance from the State of California, Department of Water Resources (DWR). If you feel the irrigated area is not accurate or would like more information on this program, contact EBMUD at (510) 986-7615.

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# 2013 EBMUD Commercial Budget Information



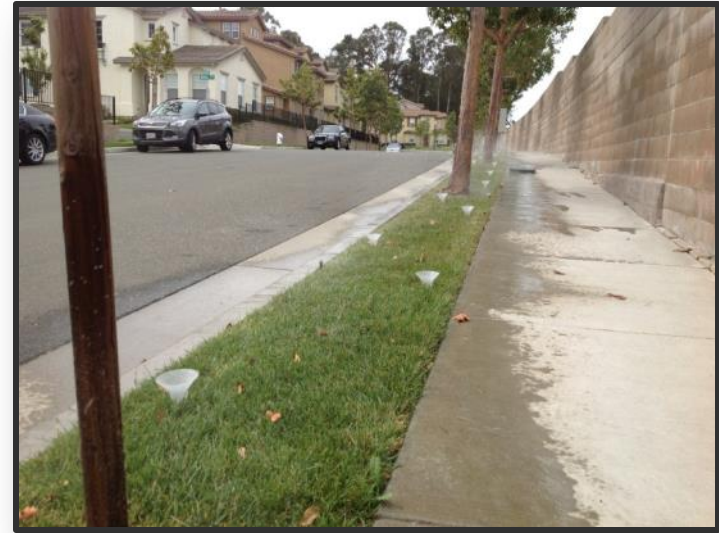
- GOLF Courses – Most Efficient customer in the program.
  - Potable Water.
  - Plant type – Cool Season Turf Grass.
  - Overhead irrigation
- Less than 1% of total budgets.
  - 17% of total water used.
  - Consumption 59% of budgeted amount.



# 2013 EBMUD Commercial Budget Information

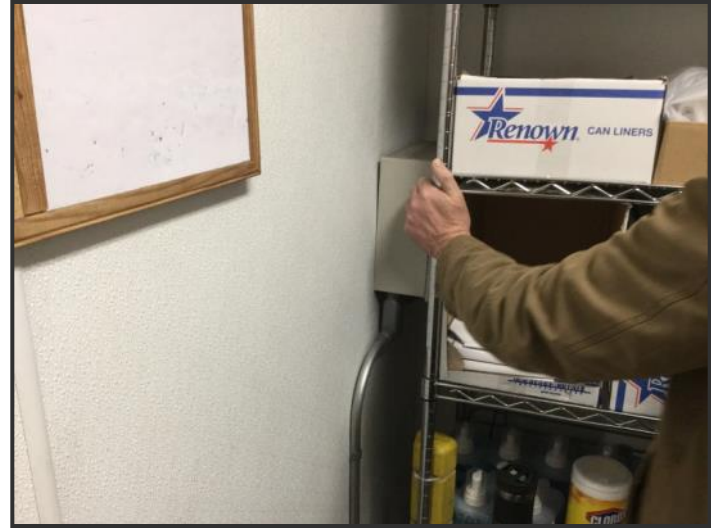


- Lawn Strips (3-5 foot wide) identified areas of water waste.
  - One of the most inefficient customers.
  - (62) Accounts (Irrigation only meters).
  - **207% of Budget.**





# EBMUD Commercial Irrigation Audits



# “Irrigation Only” Accounts (Meters) – Consumption trends



# Accounts	Year	Annual GPD Per Acct.	
4,585	2001	3,233	
5,118	2007	2,786	Drought
5,307	2013	2,575	Base Year
5,351	2015	1,498	Drought
5,414	2016	1,598	7/1/16 No drought restrictions
5,460	2017 (est)	1832	No drought restrictions



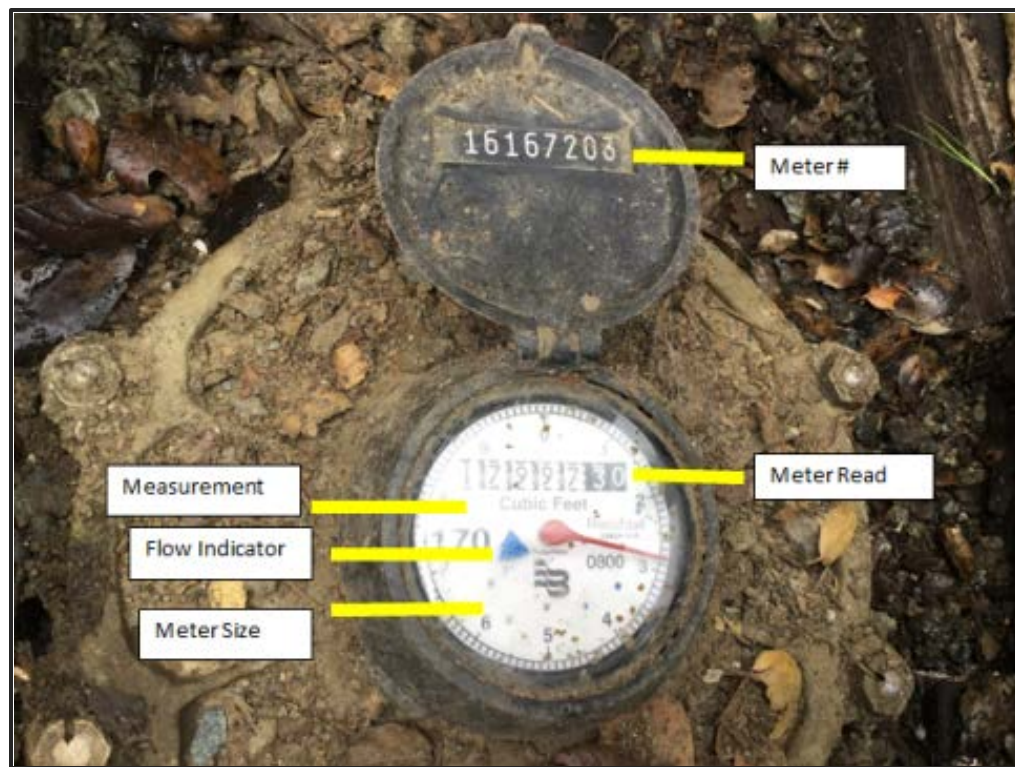
# Irrigation Audit – Maintenance



# Know your meter...Leaks, Monitor consumption



- Meter type?
  - “Irrigation Only” or Mixed Use Meter?
  - Read the Odometer to track consumption.
  - CCF (Unit) or gallons.
  - Flow and/or Leak indicator.
  - Meter Size.





# Water Pressure



**Excessive Pressure**



**Low pressure**

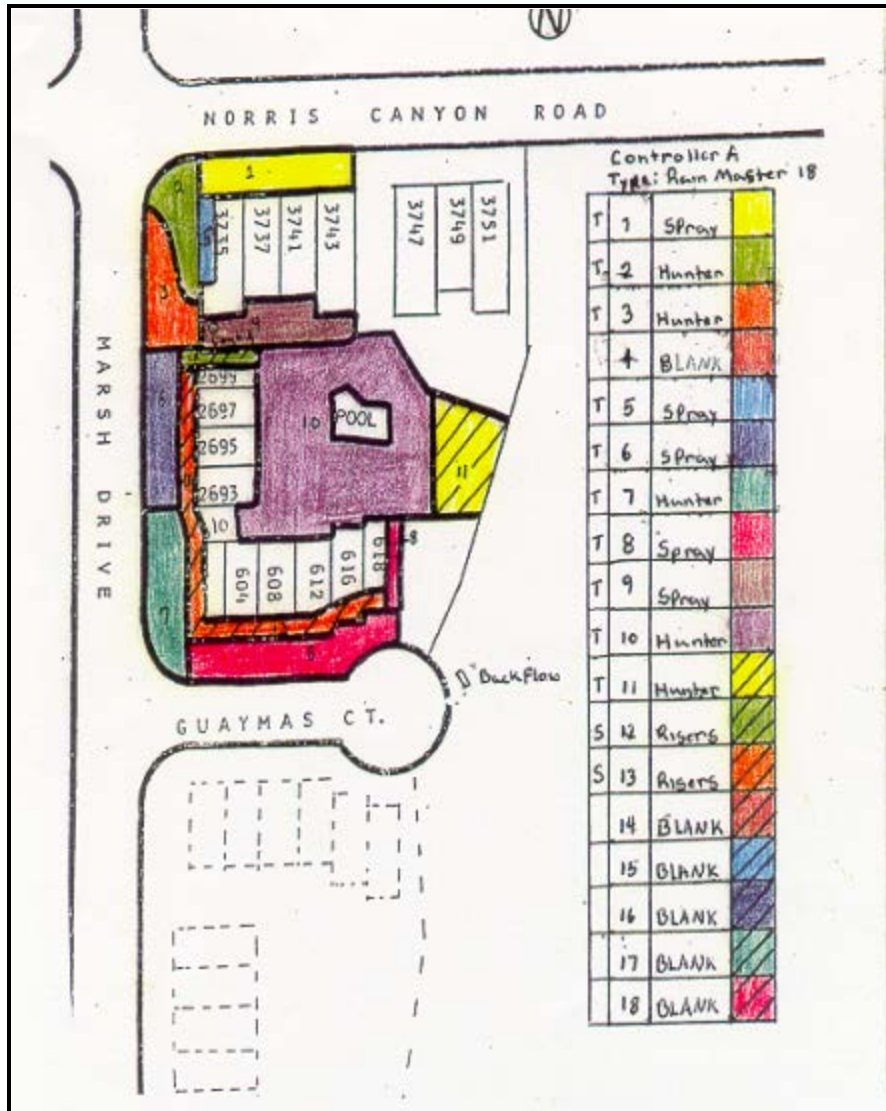
# Irrigation Scheduling

- As the season changes
- BASE irrigation schedule
- Adjust number minutes/days
- % Water Budget
- SMART, ET Controllers





# Controller Maps



- Identify:
  - Irrigated areas per station
  - Sprinkler type
  - Plant Type
  - Create Legend

# Drought Lessons Learned- Irrigation Scheduling



- Two day a week watering mandate - summer.
  - Maintained color
  - Mow every 2-3 weeks
  - Fertilize only Spring /Fall
  - SMART Controller used
  - Run cycle +100 degree days





# No Mow Turf types – sometimes!



# Plant Material Water Needs



- Most Cal Trans, BART, EBMUD, etc. irrigation meters show ZERO to very little consumption.
- Mature, low water landscapes can survive on little to no water.



# Plant Material Water Needs



# Where's the waste??

- Overspray
  - What is acceptable?
- In some cases, it is very obvious...
  - Check consumption and compare against budget.





# Difficult Areas to Irrigate Efficiently



# EBMUD Lawn Conversion and Irrigation Upgrade Rebate Program



Eligible upgrades:

- Lawn Conversion
- Drip Conversion
- High-Efficiency Nozzles
- Self-Adjusting Controllers
- Pressure Regulators
- Irrigation Submeters

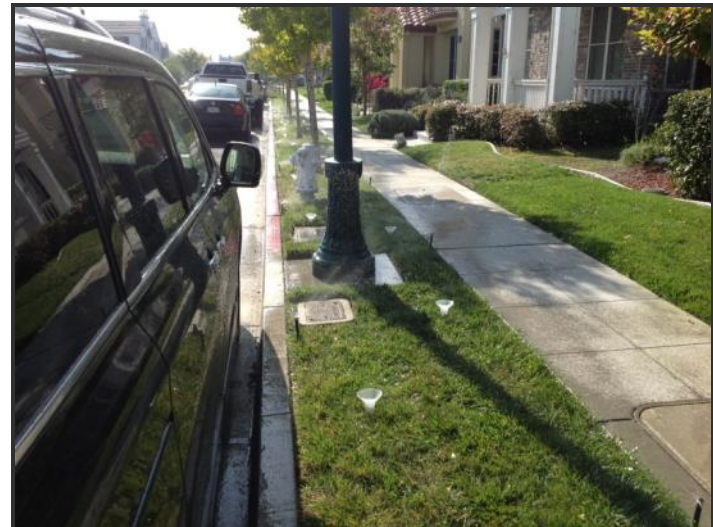
Up to \$2,000 Residential.

Up to \$15,000 - Commercial & Multi-family (5 or more units)  
- Over a two year period





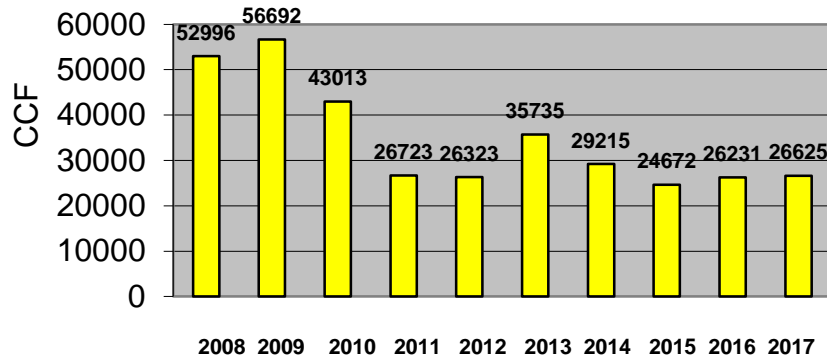
# EBMUD Lawn Conversion and Irrigation Upgrade Rebate Program



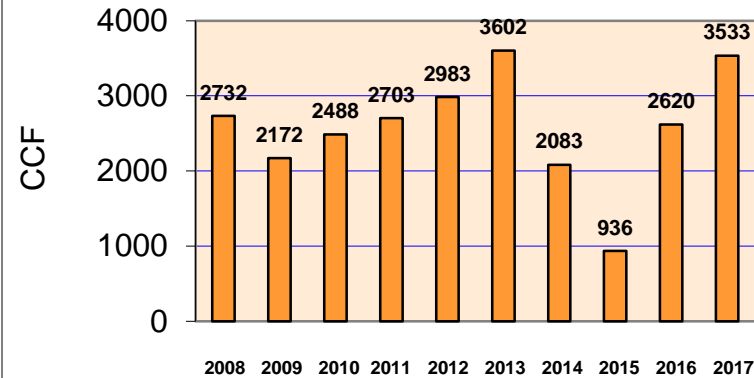
# EBMUD Commercial Rebates working??



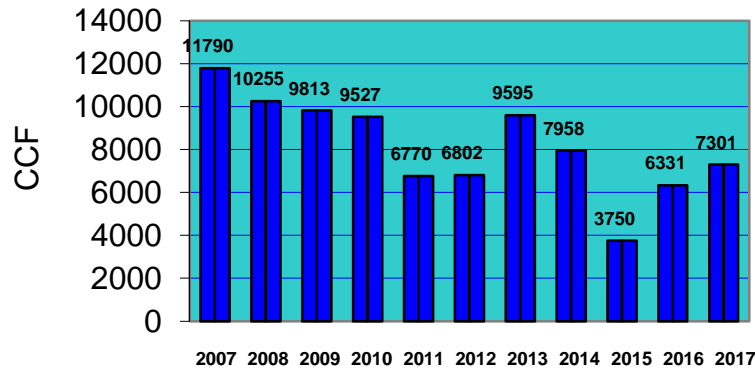
**BLANK HOA 2008 - 2017**  
(39) "Irrigation Only" Meters



**BL HOA**  
(2) "Irrigation Only Meters



**C C HOA**  
(9) "Irrigation Only" Meters



- **Yellow**
  - 2014-2016 \$15,000+ rebate
    - Rebates SMART Controllers, Lawn Reduction, HE Nozzles.
    - 2017 consumption similar to 2011-2012 Consumption (Pre-Drought) before rebates.
- **Orange**
  - 2016 \$20,000 rebate max
    - Overhead shrub spray to drip conversion.
    - 40% increase in 2017 from 2015 consumption.
- **Blue**
  - 2014 \$20,000 rebate max
    - Overhead shrub spray to drip conversion.
    - 2017 cons higher than pre-rebate years of 2011-2012.



# CIMIS (California Irrigation Management Information System)



- ET Data downloaded every night for IRIS Water Budget program.
- Moraga Station #178
- El Cerrito #213
- Oakland Metro #254 (pictured). March, 2018.
- EBMUD Staff maintains stations monthly.
  - Change out sensors when needed.

A screenshot of a web browser displaying the 'CIMIS Readings' page. The page has a light blue background and a table of data. On the left, there is a sidebar with navigation links. The main content area shows a table with columns for City, Station No., Name, Date, Station ET Reading, and Zip ET Reading. The table contains data for various stations across different cities and dates.

City	Station No.	Name	Date	Station ET Reading	Zip ET Reading
ALA	171	Union City	07/18/2012	0.17	94501 0.19
					94502 0.18
ALB	171	Union City	07/18/2012	0.17	94706 0.19
AMO	170	Concord	07/18/2012	0.22	94507 0.2
					94701 0.19
					94702 0.19
					94703 0.19
					94704 0.19
					94705 0.19
					94707 0.19
					94708 0.19
					94709 0.19
					94710 0.19
					94720 0.19
BHK	170	Concord	07/18/2012	0.22	
CR	178	Moraga	07/18/2012	0.16	94525 0.19
CV	178	Moraga	07/18/2012	0.16	94446 0.19
					94552 0.19
DAN	170	Concord	07/18/2012	0.22	94506 0.19
					94526 0.2
DBO	170	Concord	07/18/2012	0.22	94528 0.19
EC	171	Union City	07/18/2012	0.17	94530 0.19
ELS	178	Moraga	07/18/2012	0.16	94803 0.19
EMY	171	Union City	07/18/2012	0.17	94608 0.19

# CIMIS (California Irrigation Management Information System)

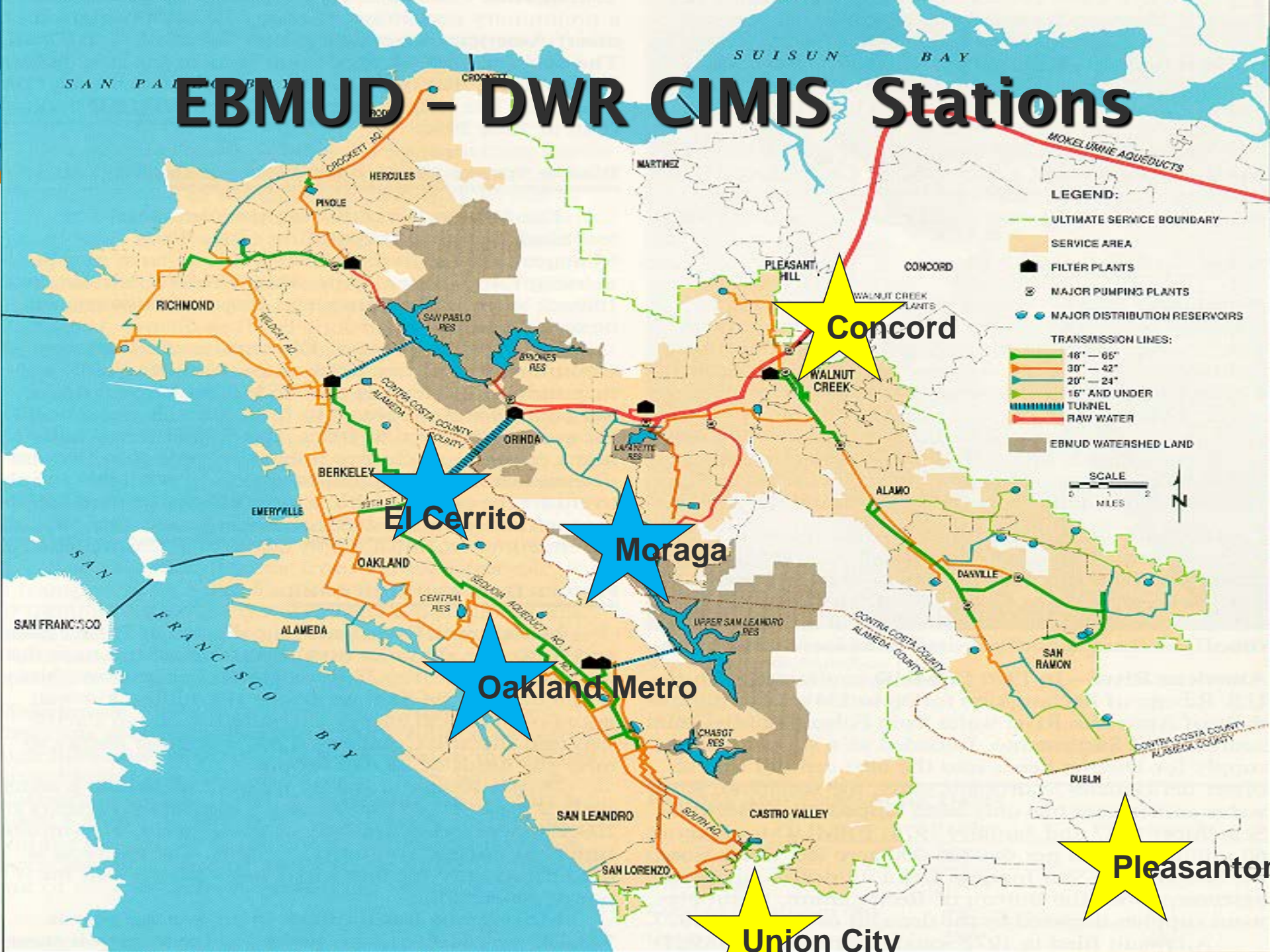


- Stations have to be sited in a irrigated area of cool season turf grass.
- Area must be secure.
- DWR (Dept. Of Water Resources).
  - Monitors data.
  - Change out sensors when needed.





# EBMUD - DWR CIMIS Stations





# EBMUD Web Page Success Stories



## Most recent – Blackhawk Master Association

## Participants are HOA's, Cities, and Business Parks

use in the landscape -- and implementing water irrigation measures -- varies with each business customer. EBMUD works closely with landscapers to help them reduce water usage by installing drip irrigation systems and other water saving devices that work for them. EBMUD thanks each customer for their dedication to water conservation. EBMUD provides technical assistance, technology and training to all customers to help them save water and lower their water bills.

**Blackhawk Homeowners Association, Danville**

Blackhawk is a beautiful community in Danville with over 2,000 homes. Landscaped roadsides, sports fields, turf athletic fields, and parks make up the 24 common areas within Blackhawk. In 2003, Community Manager Mark Goldberg researched new irrigation controller technologies to reduce water used in these open spaces. The Blackhawk Homeowners Association Board of Directors decided on an In-line Drip Irrigation System and installed 32 controllers in 2004.

Blackhawk now has more than 50 controllers on site. Working with EBMUD, Blackhawk dropped the amount of water used for irrigation by 25 million gallons. How? They removed narrow lawn areas and replaced overhead sprinklers with in-line drip irrigation.

A great example of how to reduce costs and maintenance without sacrificing the beauty of a well-kept landscape.

**How much water was saved?**

Blackhawk HOA dramatically reduced the amount of water used for irrigation -- from 51 million gallons in 2001 to 37 million gallons in 2011. This is a savings of \$45,000 in water costs alone. Adding in savings from reduced maintenance results in savings of millions of gallons and thousands of dollars for years to come.

**Blackhawk HOA, 2001 - 2011  
32 Irrigation Only Meters**

Year	Water Usage (Gallons)
2001	67,207
2002	67,833
2003	62,856
2004	68,580
2005	65,817
2006	51,583
2007	52,823
2008	46,187
2009	46,122
2010	34,879
2011	37,401

**Success Stories**

Below are a few more success stories that we hope will inspire other customers to find ways to reduce their irrigation water use.

EBMUD recognizes these businesses and customers for their water conserving efforts. However, EBMUD makes no representation regarding these businesses or that similar water savings will be achieved at other sites.

The documents below are PDF files which can be viewed and printed with Adobe Acrobat Reader, a free software.

Success Story	File Size
Irrigation Savings for Blackhawk HOA, Danville	2.94 MB
Irrigation Savings for City of San Ramon, Upper Bollinger Canyon	2.77 MB
Harbor Bay Business Park Association	656.56 KB
Irrigation Savings for Cobblestone Court HOA (Pleasant Hill)	636.62 KB
Irrigation Savings for Crow Canyon Heights HOA (Danville)	644.43 KB
Irrigation Savings for Palomares Hills HOA (Castro Valley)	640.72 KB
Irrigation Savings for Skywest HOA (Walnut Creek)	638.54 KB
Irrigation Savings for City of El Cerrito	809.64 KB
Irrigation Savings for El Cerrito Plaza	642.43 KB
Irrigation Savings for Trevarl HOA (San Ramon)	626.77 KB
Irrigation Savings for Danville Ranch	645.52 KB
Irrigation Savings for West Court Village Condo HOA (Richmond)	628.78 KB

**water & wastewater**

- water supply
- wastewater collection & treatment
- water quality
- private sewer lateral program
- water conservation
- residential pollution prevention
- recycled water

**RELATED LINKS**

- project updates
- rates & charges
- emergency preparedness

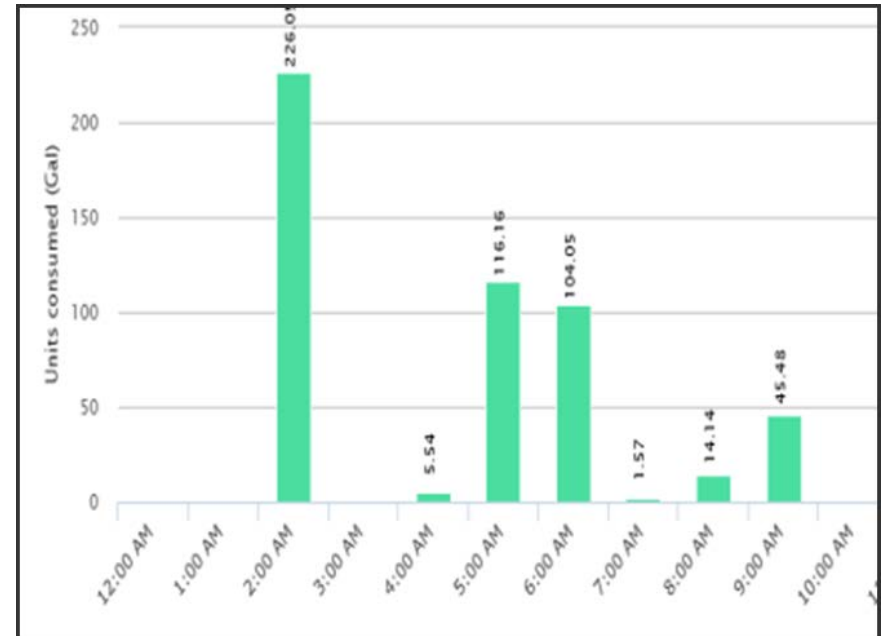


# SMART Meters...



Understand the new technology.

Use to your advantage.







# Summary....



- Customers ultimately responsible for how efficiently water is being used in the landscape.
- Patience...It may take years for customer to start improving overall irrigation management.
- Water Budgets: Summarizes how efficiently water is used in the landscape.
- Drought, an effective tool against - Drought.

# Thank You from EBMUD



- Dave Langridge  
EBMUD Water  
Conservation Rep.  
Commercial Irrigation
- 510 986-7615
- [dlangrid@ebmud.com](mailto:dlangrid@ebmud.com)



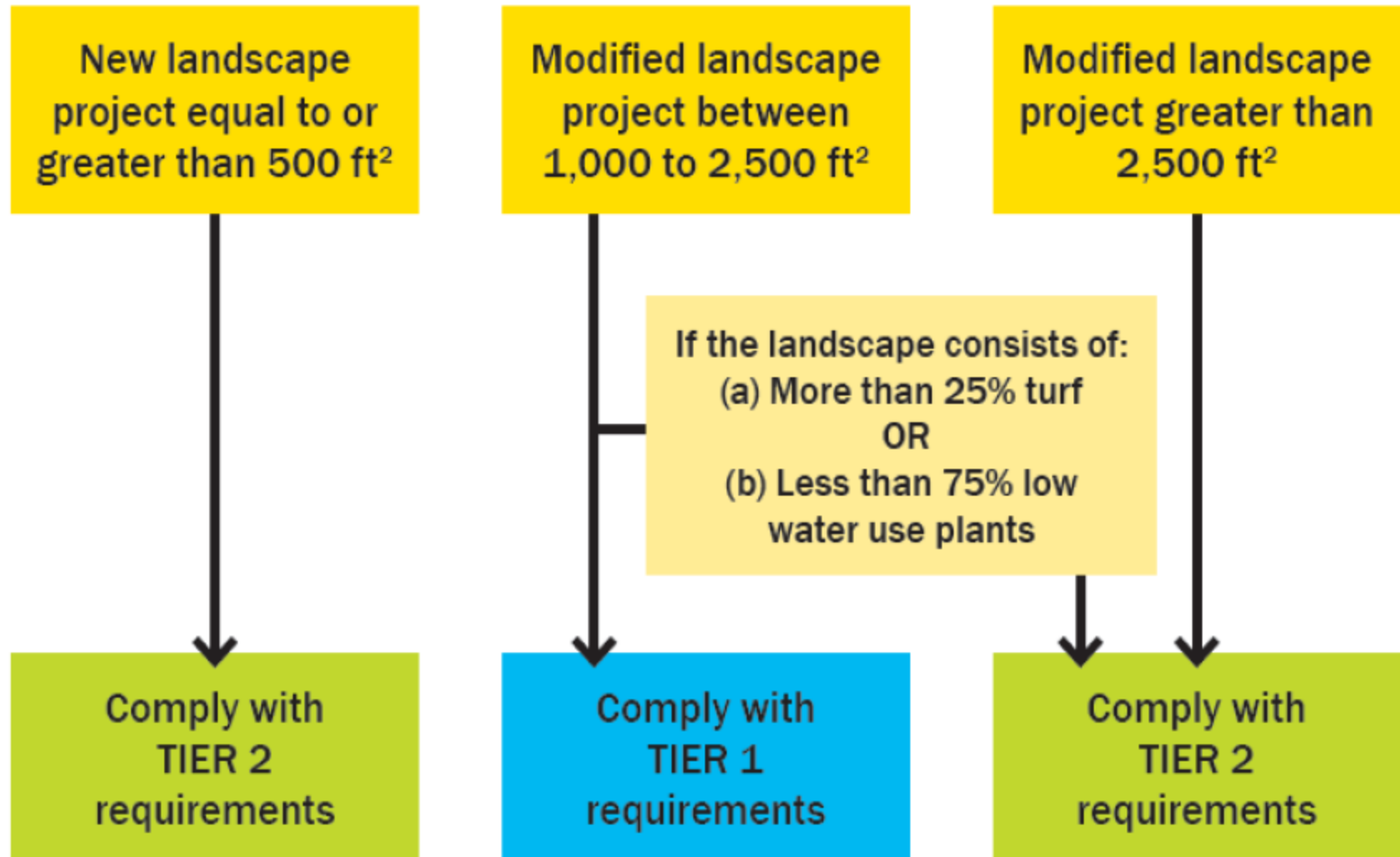
# **San Francisco's Water Efficient Irrigation Ordinance (WEIO)**

**July 23, 2018**  
**Sergio Ramirez, Water Conservation Administrator**  
**Water Resources Division**  
**Water Enterprise**



# San Francisco Water Efficiency Irrigation Ordinance (WEIO)

## Triggers for Compliance







# Tracking Projects

- 45 Confirmed Dedicated Irrigation Meters
- 62 Confirmed Mixed or Standard Use Meters
- 108 Projects under construction/meter undetermined

## Projects Received by Fiscal Year

<b>Fiscal Year</b>	<b># of Projects</b>
10-11	11
11-12	17
12-13	30
13-14	21
14-15	30
15-16	33
16-17	32
17-18	40
18-19	1
<b>Total</b>	<b>215</b>

# Assessment Observations

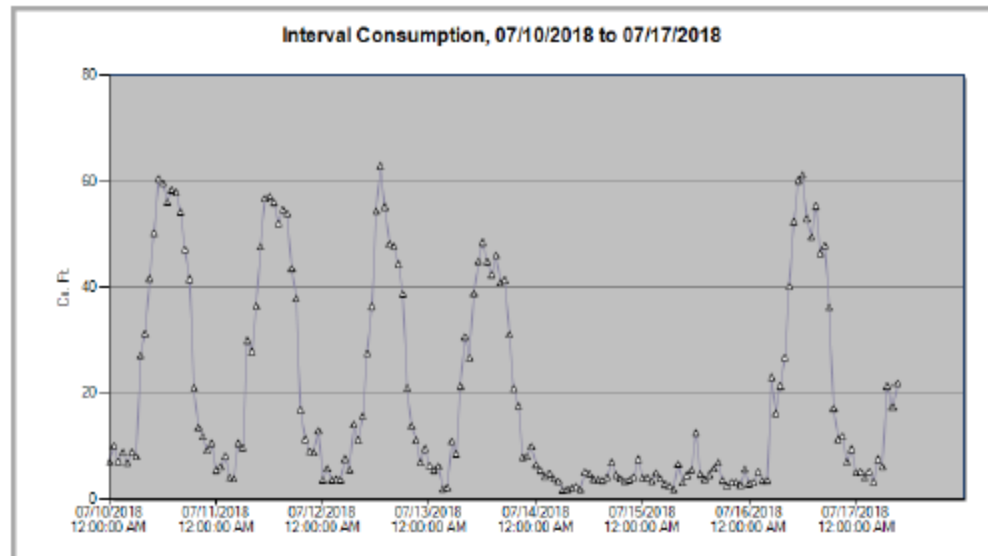
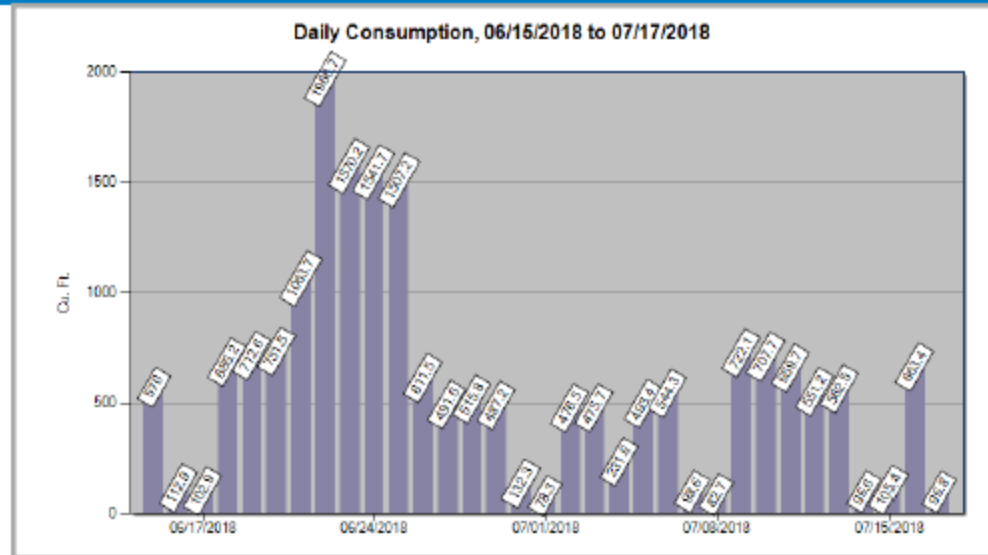
- 13 Landscape Assessments Performed
- Irrigation Systems are predominantly well-designed
  - Valve and emitter placements, plant selection, accessibility to timers
- Site managers hit or miss: landscape/irrigation knowledge
- Follow-up with managers to complete Certificate of Completion





# Challenges to WEIO Project Verification

- Mixed Use Meters
- Contacting Responsible Parties
- Scheduling Post-Assessments
- Follow-up with maintenance/landscape company
- Construction timing



# Calculated vs. Actual

- Preliminary review of Irrigated Meters
- FY 17-18 water use
- Across all account types
- Approximately half meet their MAWA







# More Information

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Website:

[www.sfwater.org/landscape](http://www.sfwater.org/landscape)

**Sergio Ramirez**

Water Conservation Administrator

San Francisco Public Utilities Commission (SFPUC)

[sramirez@sfwater.org](mailto:sramirez@sfwater.org)

(415) 551.4745

# Marina Seagate HOA in San Leandro



- Built in 1988
- 22 acre property
- ½ mile from the Bay
- Streams and fountains
- 23 ponds





# Marina Seagate HOA San Leandro



## 2013 Northern Landscape Management

### Water Saving Projects

- 18,000 sq. ft. of lawn reduction
- Converting 5 ponds to low water use gardens
- Monthly analysis of water use
- Fixing leaks
- Close relationship with Northern Landscape Management



# Pond Renovation



- Asphalt pond bottom
- 8-12 inches of drain rock
- Layer of filter fabric
- 2-3 feet of fill dirt
- 6-12 inches of planter mix
- Netafin irrigation
- 2 inches of mulch
- Moss rock accent boulders
- WUCOLS rates low and very low water use plants.





# Water Consumption (CCF's) 2007-2017



**Marina Seagate HOA 2007 - 2016**  
**8 Irrigation Only Meters**

