

This presentation premiered at WaterSmart Innovations

watersmartinnovations.com





Using Water Budgets to Assist Drought Response

Scott Snyders, Austin Krcmarik, Phill Segura



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WHAT YOU
NEED.**

 **DENVER WATER**
denverwater.org

Water Budgets

Introduction/Background (Phill Segura)

Implementation (Austin Krcmarik)

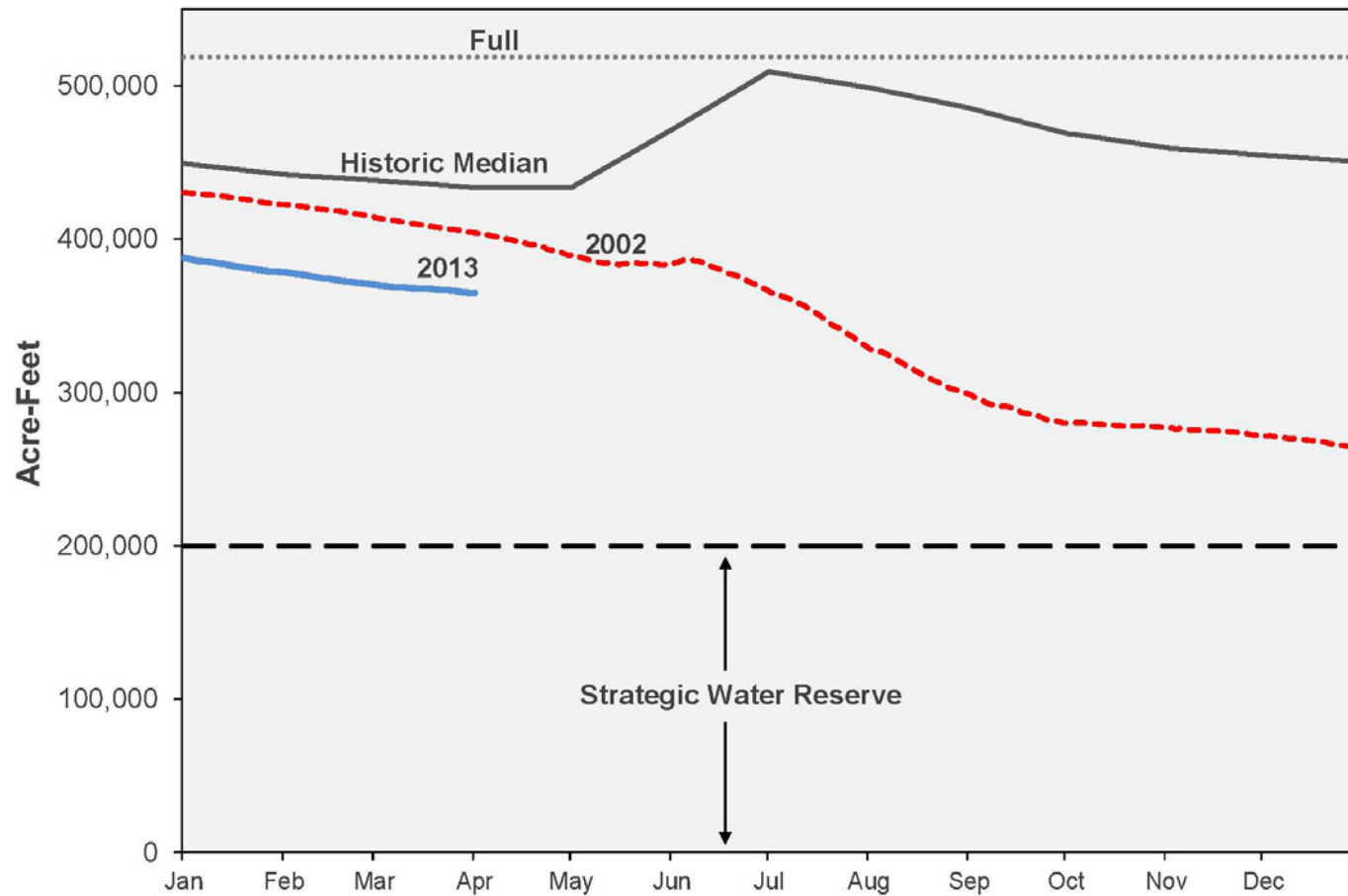
Making it work on the ground (Scott Snyders)

The bottom of the slide features a banner with a blue background on the left and right showing water splashes, and an orange background in the center. The slogan "USE ONLY WHAT YOU NEED." is written in white capital letters on the orange background.

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SUPPLY RESERVOIR CONTENTS



Note: The Board has designated 200,000 acre feet of stored water to protect against unforeseen circumstances such as a dam or tunnel failure, a water quality crisis, climate change or catastrophic drought.

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Water Budgets

- Stage 2 drought declared in 2013
- 2 day a week watering restriction presents challenge to large customers

Solution = Water Budget

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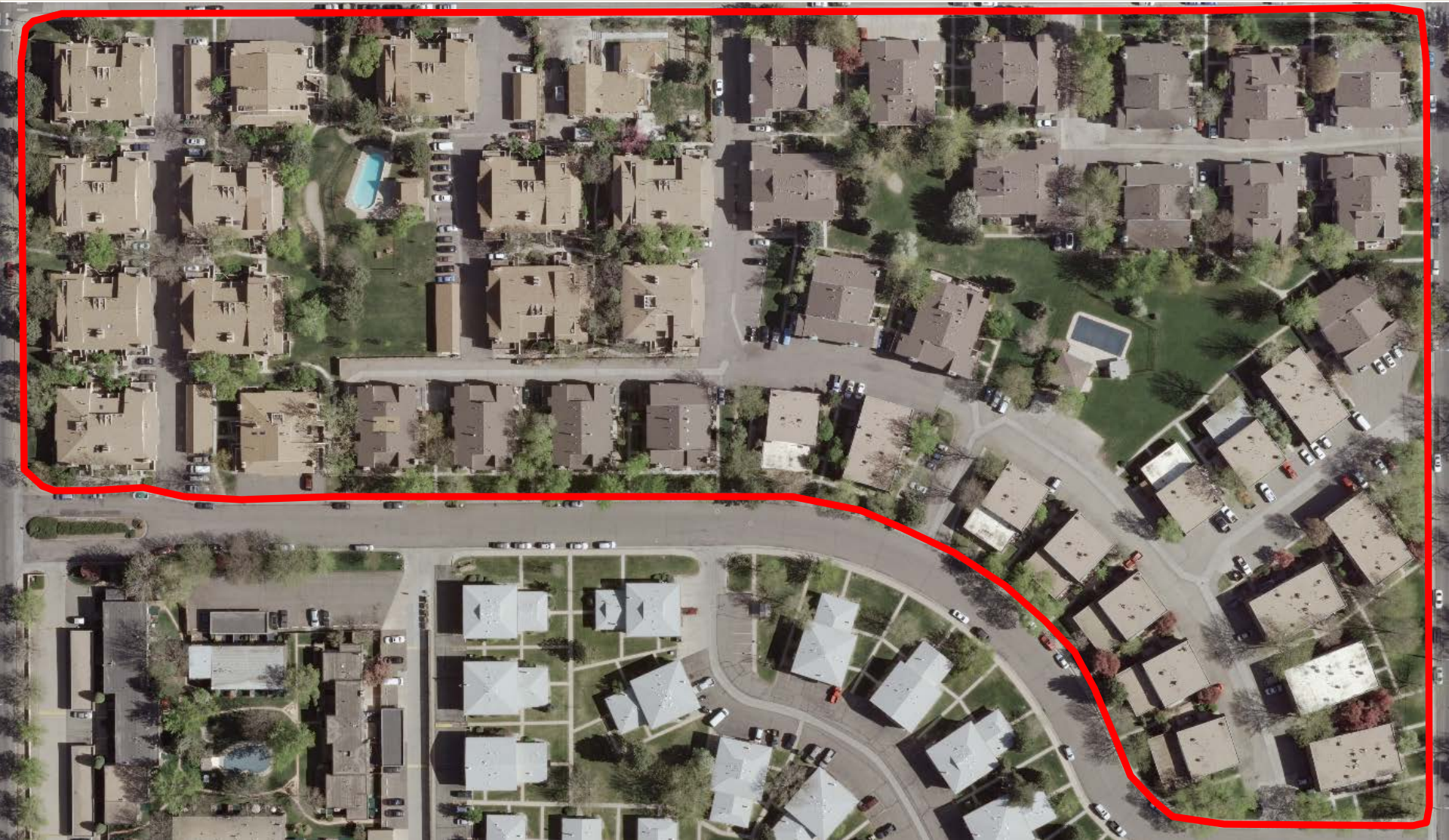
Requirements

- Based on efficient use, not historical
- Ability to monitor and report progress
- Ability to grant exception from watering restrictions (*but not all restrictions!*)

The bottom of the slide features a blue background with a white, bubbly water splash pattern. A solid orange horizontal bar spans the width of the slide, containing the text 'USE ONLY WHAT YOU NEED.' in white, bold, sans-serif capital letters.

USE ONLY WHAT YOU NEED.

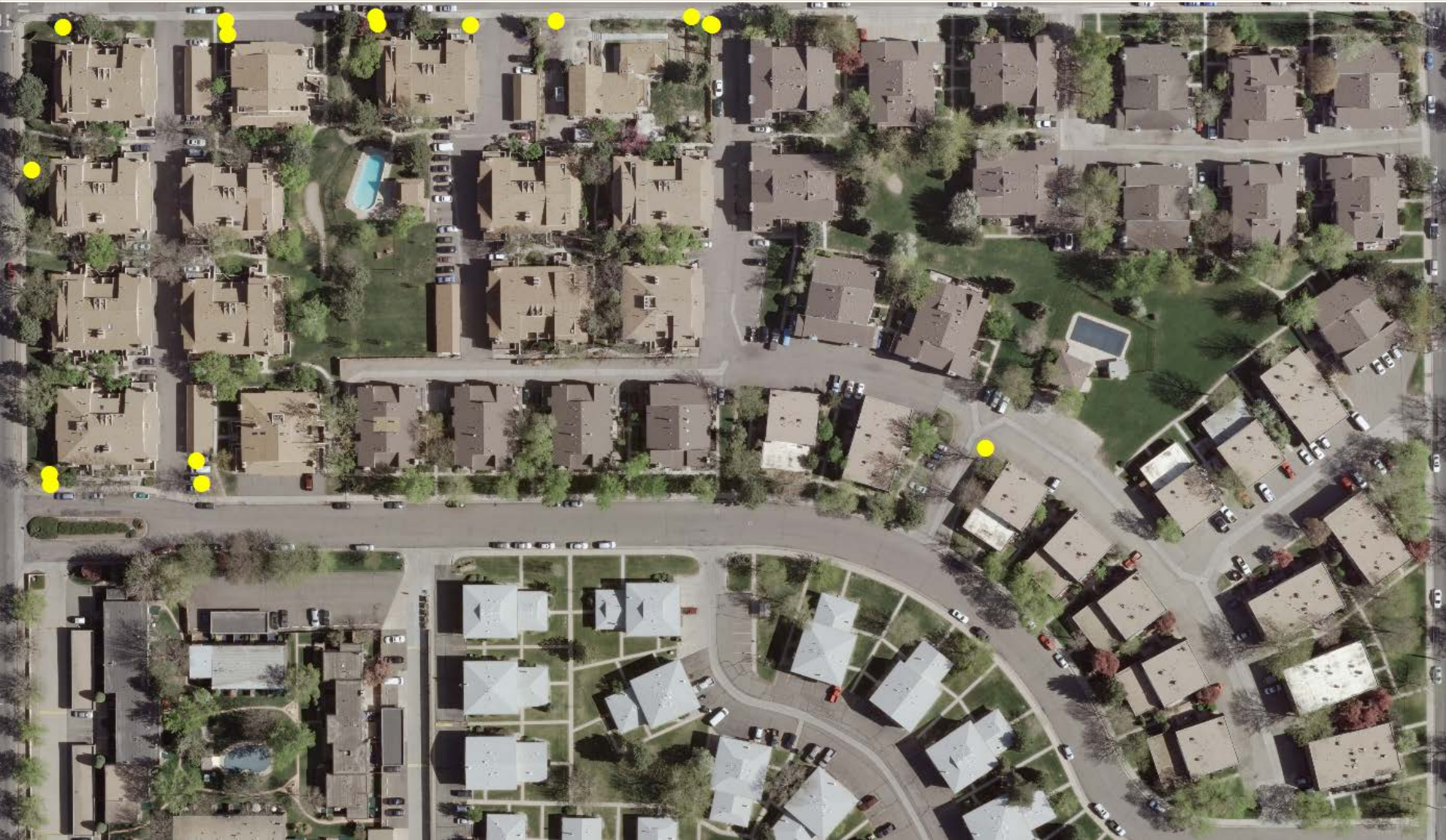
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How well do we really know our customers?

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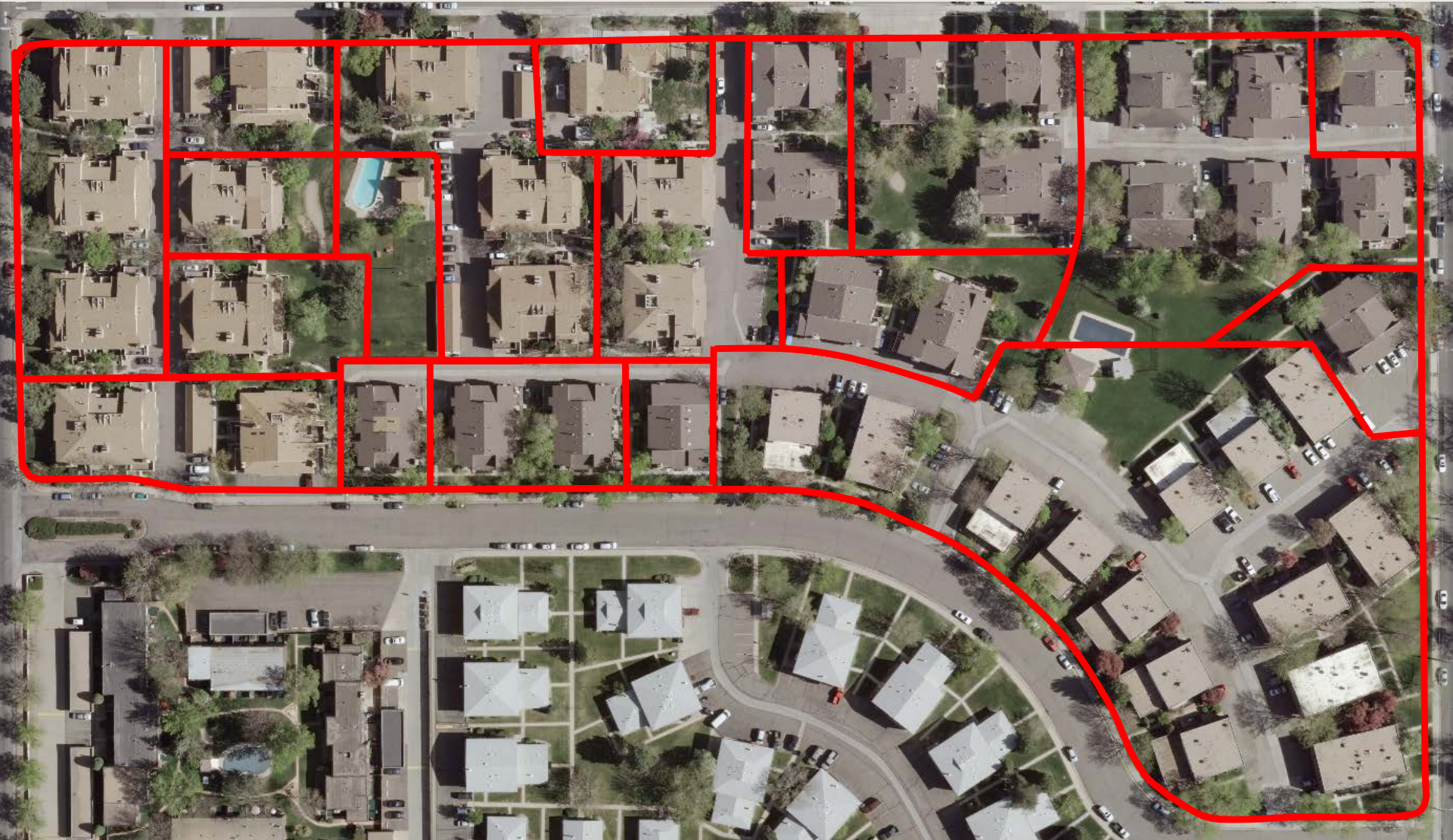




Meters

USE ONLY WHAT YOU NEED.

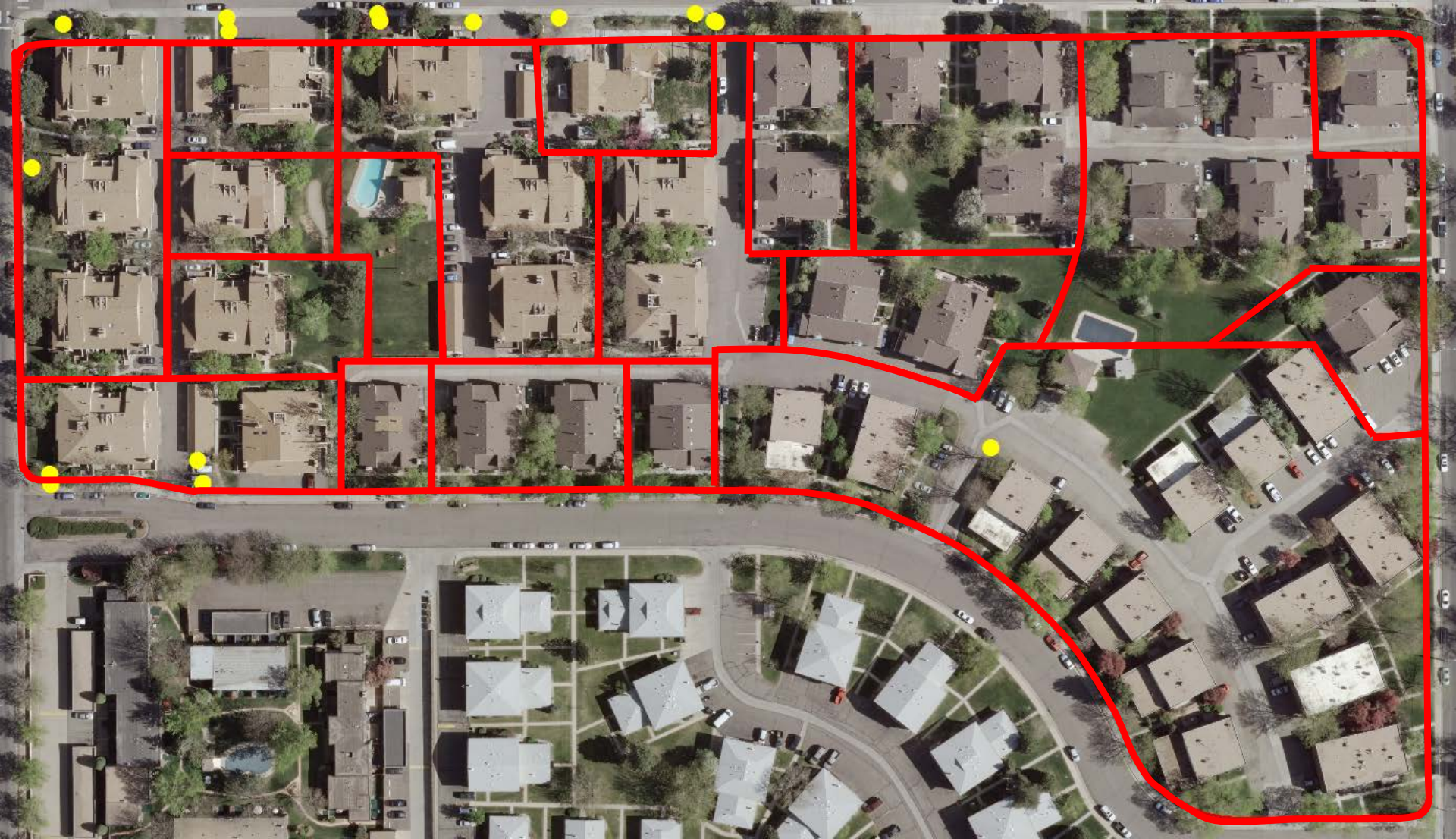
 DENVER WATER



Parcels

USE ONLY WHAT YOU NEED.





Clear as Mud

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Billing System Addresses (15)

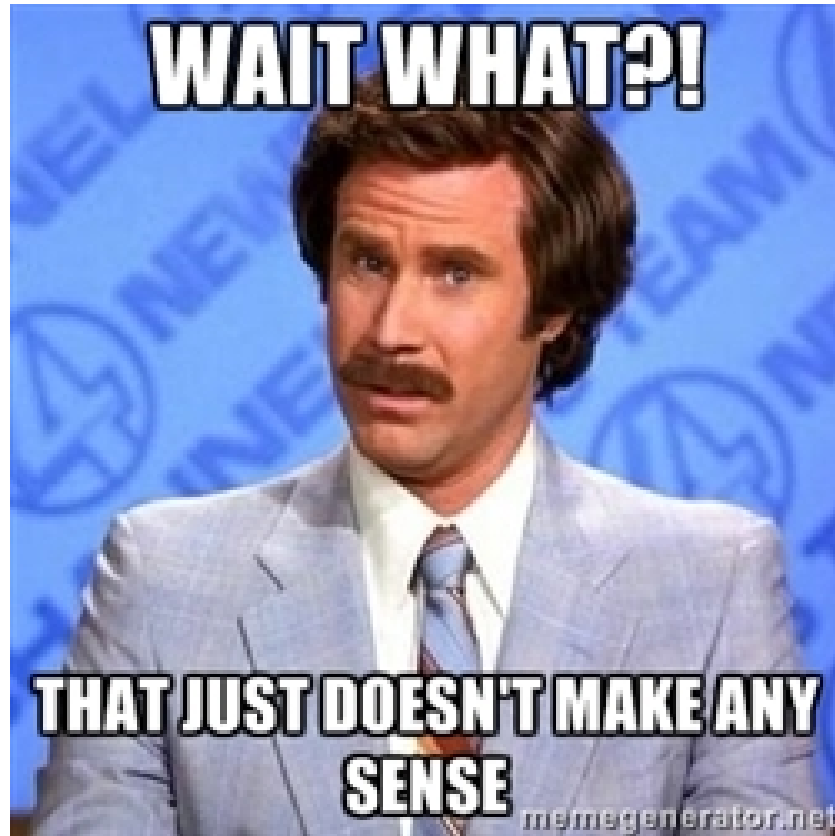
Meter	Address
224715	6785 E ARIZONA AVE
257524	1180 S MONACO PKWY
257525	6565 E ARIZONA AVE
258548	1160 S MONACO PKWY
258549	6545 E ARIZONA AVE
259489	6660 E MISSISSIPPI AVE
259490	6680 E MISSISSIPPI AVE
260224	6620 E MISSISSIPPI AVE
260225	6640 E MISSISSIPPI AVE
260450	6610 E MISSISSIPPI AVE
260451	6600 E MISSISSIPPI AVE
261661	6550 E MISSISSIPPI AVE
261662	6570 E MISSISSIPPI AVE
261769	1110 S MONACO PKWY
261770	1140 S MONACO PKWY

Valid USPS Address on the Ground (46) (274) including unit designation

ADDRESS	ADDRESS
6545 E ARIZONA AVE	6615 E ARIZONA AVE
6565 E ARIZONA AVE	6625 E ARIZONA AVE
6550 E MISSISSIPPI AVE	6665 E ARIZONA AVE
6570 E MISSISSIPPI AVE	6685 E ARIZONA AVE
6600 E MISSISSIPPI AVE	6735 E ARIZONA AVE
6620 E MISSISSIPPI AVE	6745 E ARIZONA AVE
6640 E MISSISSIPPI AVE	6785 E ARIZONA AVE
6660 E MISSISSIPPI AVE	6795 E ARIZONA AVE
6680 E MISSISSIPPI AVE	6805 E ARIZONA AVE
6690 E MISSISSIPPI AVE	6825 E ARIZONA AVE
6700 E MISSISSIPPI AVE	6845 E ARIZONA AVE
6720 E MISSISSIPPI AVE	6865 E ARIZONA AVE
6750 E MISSISSIPPI AVE	6885 E ARIZONA AVE
6770 E MISSISSIPPI AVE	1135 S ONEIDA ST
6790 E MISSISSIPPI AVE	1145 S ONEIDA ST
6800 E MISSISSIPPI AVE	1155 S ONEIDA ST
6820 E MISSISSIPPI AVE	1165 S ONEIDA ST
6840 E MISSISSIPPI AVE	1175 S ONEIDA ST
6860 E MISSISSIPPI AVE	1185 S ONEIDA ST
6880 E MISSISSIPPI AVE	1195 S ONEIDA ST
6890 E MISSISSIPPI AVE	1180 S MONACO PK
	1160 S MONACO PK
	1140 S MONACO PK
	1110 S MONACO PK

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Who are we establishing a water budget for?

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Customer Defined

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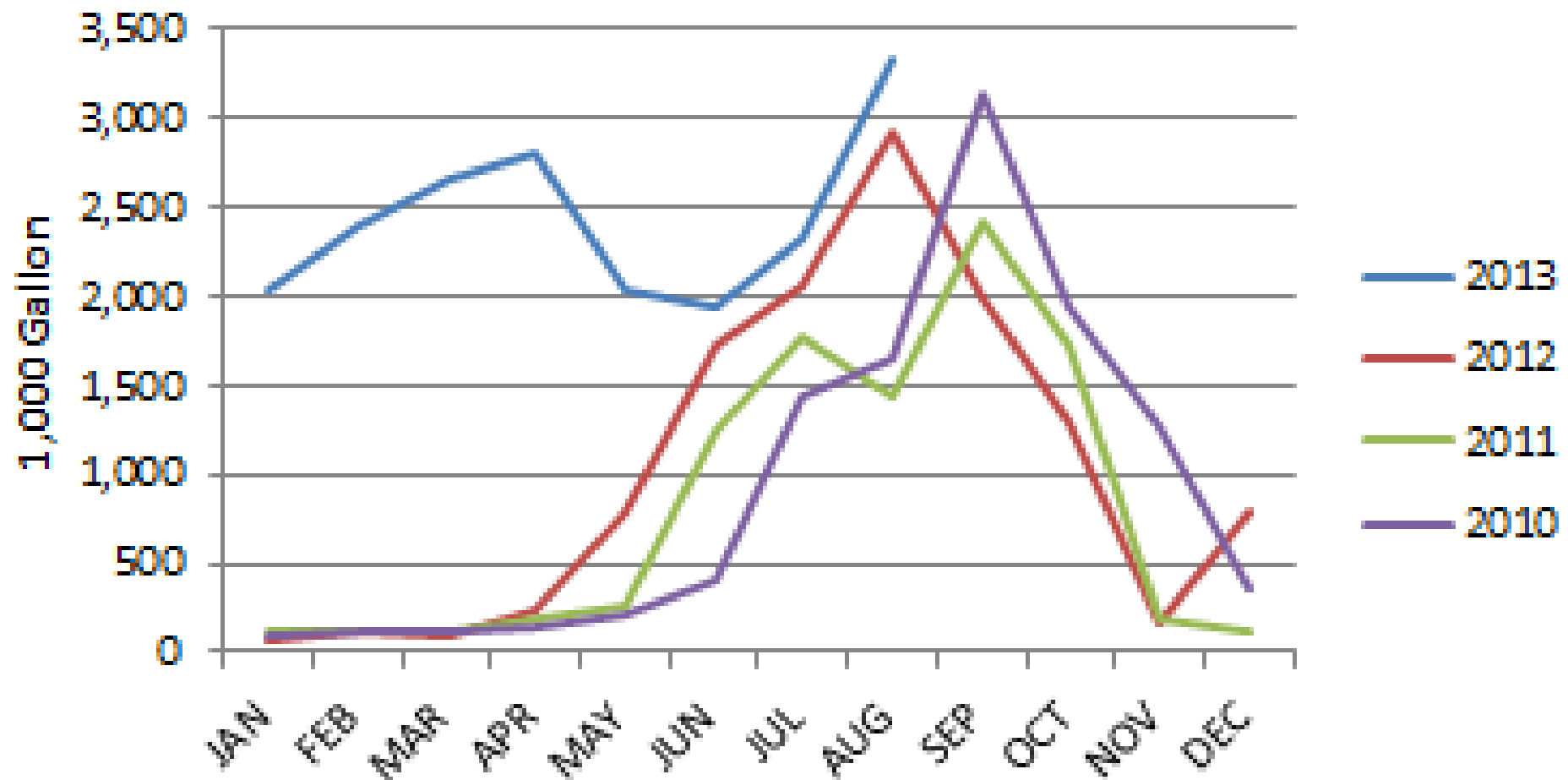
Developing a Water Budget



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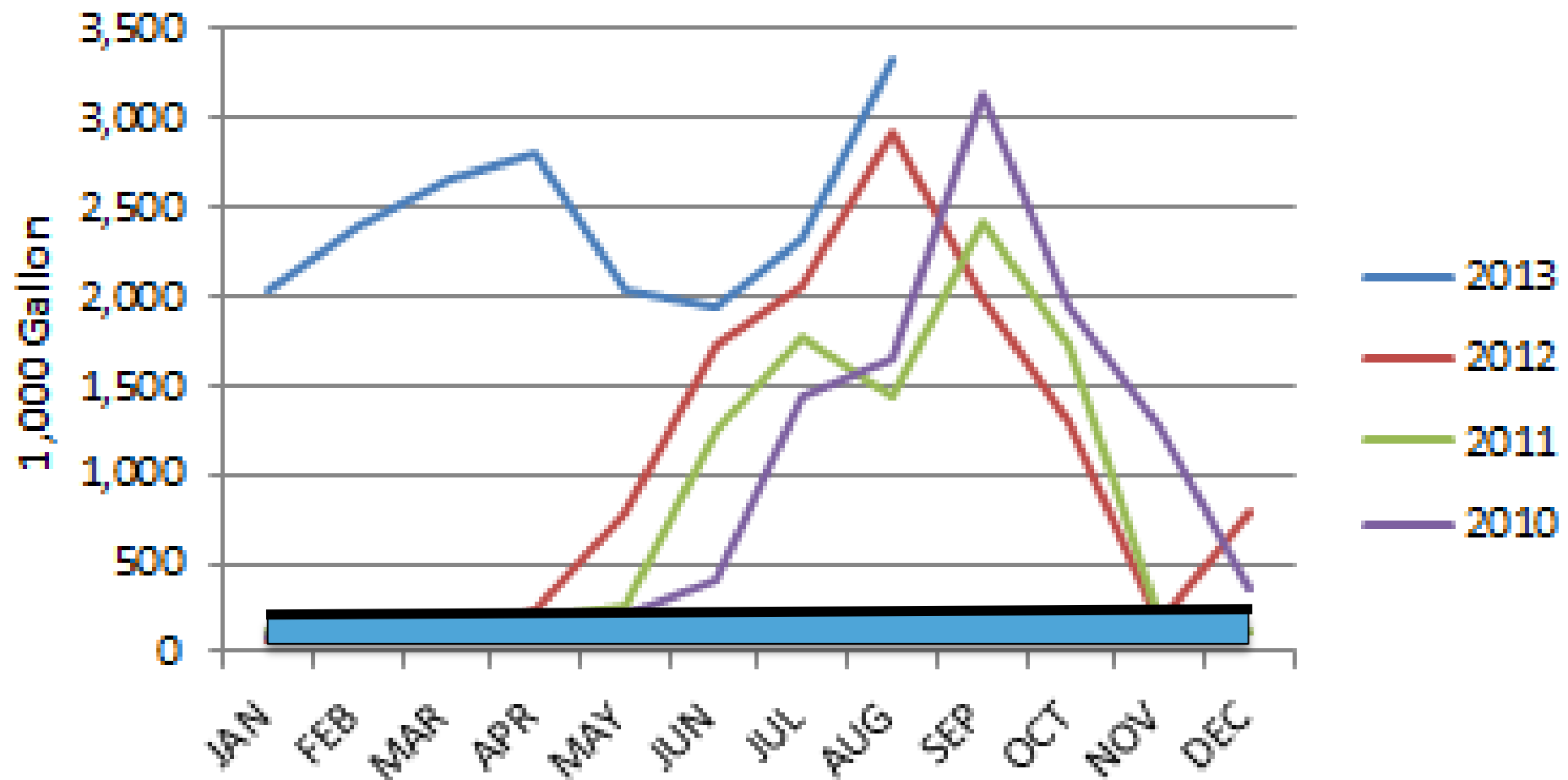
Water Use



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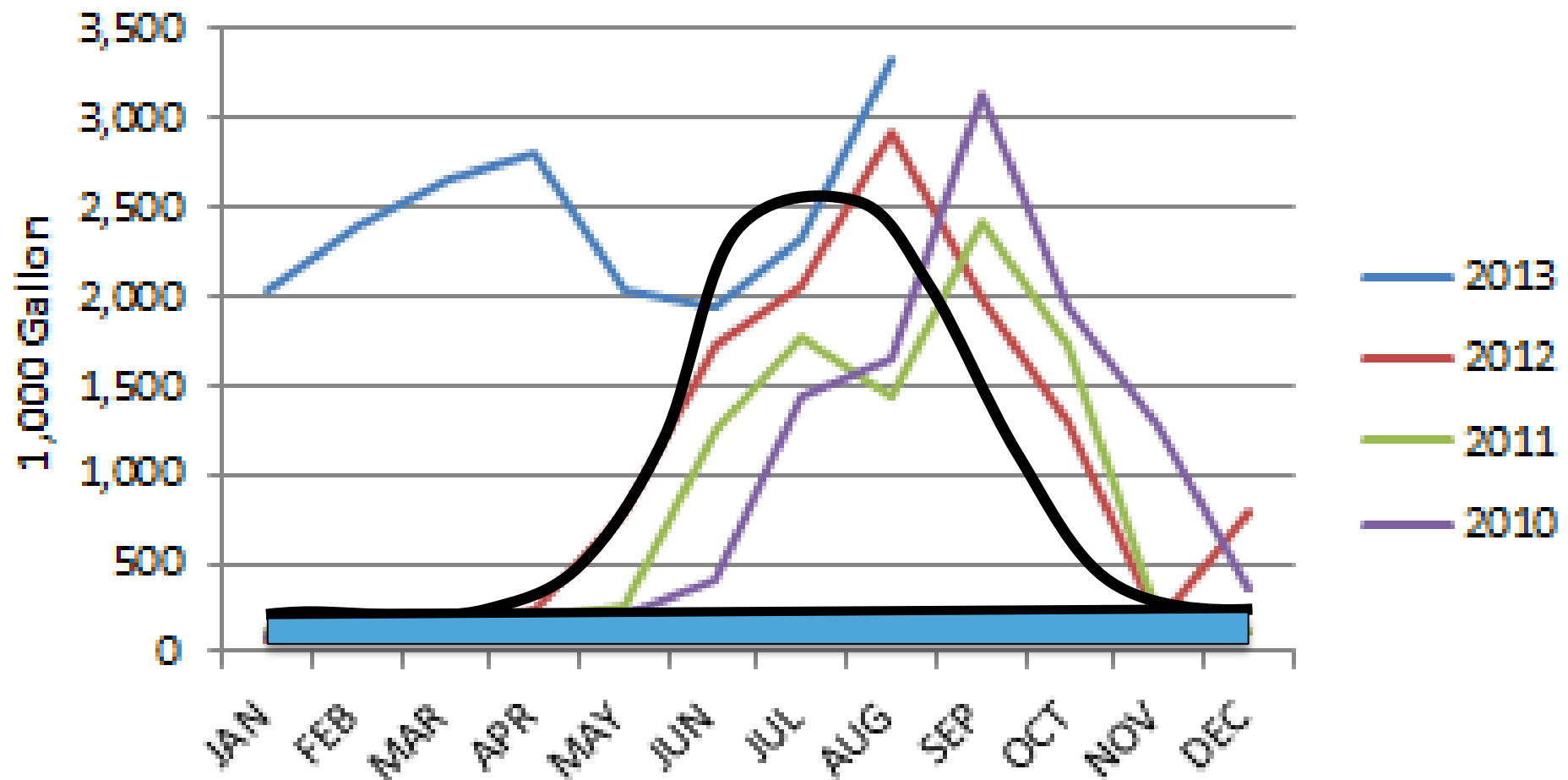
Water Use



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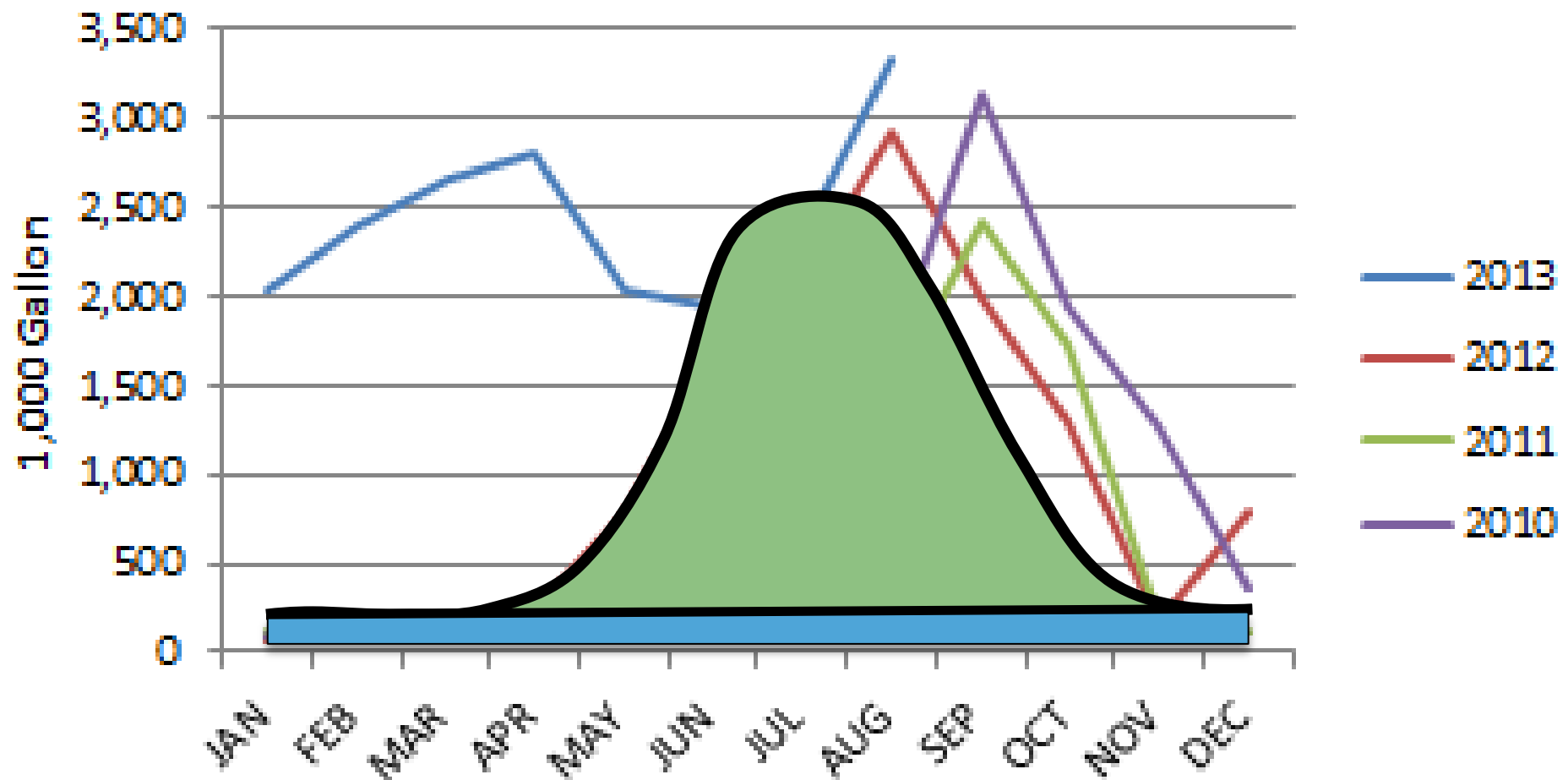
Water Use



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Water Use



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Application Process

- Property Manager
- Landscape Company
- Number of Accounts
- Map or image of the property with boundary marked



2014 WATER BUDGET PROGRAM APPLICATION

Qualifications:

- Must have a minimum of 1 acre of irrigated landscaped area.
- The application form and additional information must be submitted to Denver Water in its entirety before the property will be considered for the Water Budget Program.

Date:

Enter the name and address of the person/company applying for the Water Budget Program:

Name of property owner/responsible party		Daytime Phone No.
Property Name		Email
Address	City	Zip code

Enter the landscape maintenance company responsible for operation of the irrigation system:

Company		Daytime Phone No.
Contact		Email
Address	City	Zip code
Denver Water or Water Provider Account No.	Water Provider	
(See next page for multiple accounts)		
Applicant Signature		Date

Additional information required:

- Map of property and identified irrigated areas

As the authorized representative for _____, I authorize Denver Water to release the water consumption information for the account(s) and years listed in Water Budget Program application to the following identified companies or organizations, and their employees, during the 2014 calendar year, unless I otherwise instruct in writing. (Customer) releases and waives any and all claims that it may have against Denver Water, its officers, agents and employees for the release of such information as authorized in this letter.

Landscape Maintenance Company: _____

Special District (e.g. Metro District): _____

Other: _____

Please submit this application along with the property map to:

Water Budget Program
1600 W. 12th Ave., MC 330, Denver CO 80204
or waterbudget@denverwater.org

The deadline to enter the program is May 31, 2014

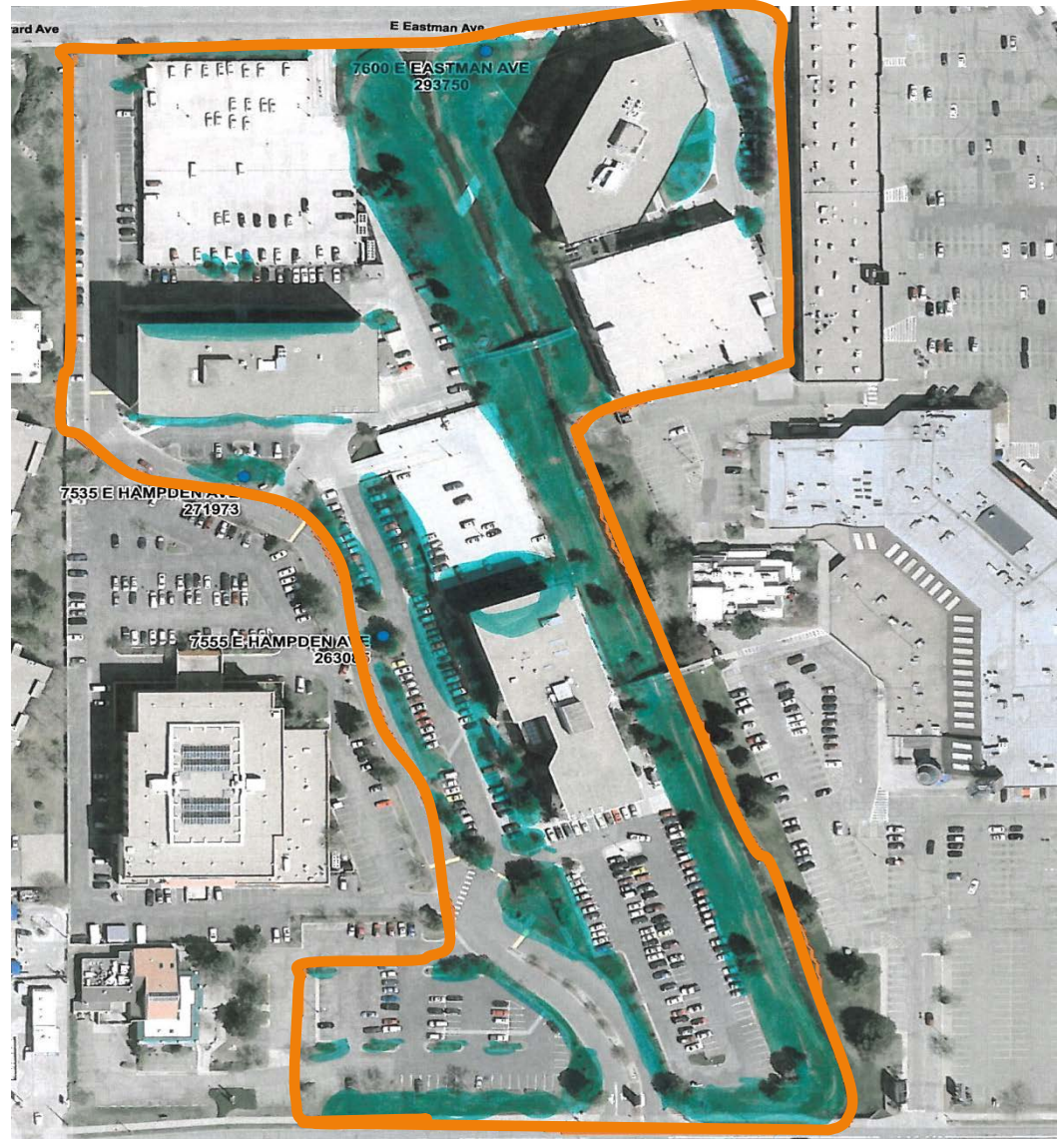
FULL APPLICATION IS 2 PAGES - PAGE 1

VMP Form/11/13

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Application Process

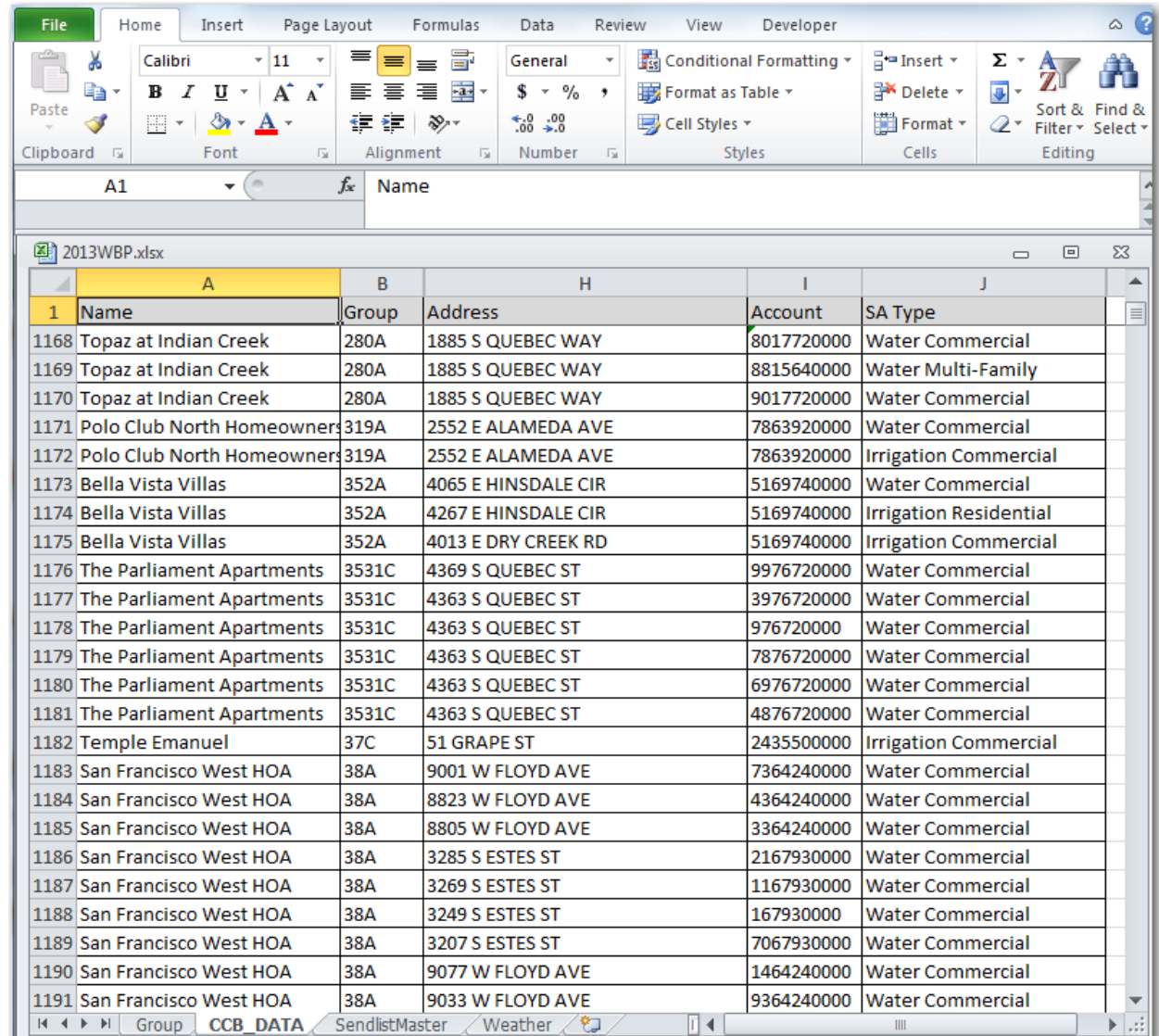


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Application Process

- Group code created to match customer defined information
- Names are not consistent in billing
- Addresses are not consistent in billing
- Accommodates different account types



	A	B	H	I	J
	Name	Group	Address	Account	SA Type
1168	Topaz at Indian Creek	280A	1885 S QUEBEC WAY	8017720000	Water Commercial
1169	Topaz at Indian Creek	280A	1885 S QUEBEC WAY	8815640000	Water Multi-Family
1170	Topaz at Indian Creek	280A	1885 S QUEBEC WAY	9017720000	Water Commercial
1171	Polo Club North Homeowners	319A	2552 E ALAMEDA AVE	7863920000	Water Commercial
1172	Polo Club North Homeowners	319A	2552 E ALAMEDA AVE	7863920000	Irrigation Commercial
1173	Bella Vista Villas	352A	4065 E HINSDALE CIR	5169740000	Water Commercial
1174	Bella Vista Villas	352A	4267 E HINSDALE CIR	5169740000	Irrigation Residential
1175	Bella Vista Villas	352A	4013 E DRY CREEK RD	5169740000	Irrigation Commercial
1176	The Parliament Apartments	3531C	4369 S QUEBEC ST	9976720000	Water Commercial
1177	The Parliament Apartments	3531C	4363 S QUEBEC ST	3976720000	Water Commercial
1178	The Parliament Apartments	3531C	4363 S QUEBEC ST	976720000	Water Commercial
1179	The Parliament Apartments	3531C	4363 S QUEBEC ST	7876720000	Water Commercial
1180	The Parliament Apartments	3531C	4363 S QUEBEC ST	6976720000	Water Commercial
1181	The Parliament Apartments	3531C	4363 S QUEBEC ST	4876720000	Water Commercial
1182	Temple Emanuel	37C	51 GRAPE ST	2435500000	Irrigation Commercial
1183	San Francisco West HOA	38A	9001 W FLOYD AVE	7364240000	Water Commercial
1184	San Francisco West HOA	38A	8823 W FLOYD AVE	4364240000	Water Commercial
1185	San Francisco West HOA	38A	8805 W FLOYD AVE	3364240000	Water Commercial
1186	San Francisco West HOA	38A	3285 S ESTES ST	2167930000	Water Commercial
1187	San Francisco West HOA	38A	3269 S ESTES ST	1167930000	Water Commercial
1188	San Francisco West HOA	38A	3249 S ESTES ST	167930000	Water Commercial
1189	San Francisco West HOA	38A	3207 S ESTES ST	7067930000	Water Commercial
1190	San Francisco West HOA	38A	9077 W FLOYD AVE	1464240000	Water Commercial
1191	San Francisco West HOA	38A	9033 W FLOYD AVE	9364240000	Water Commercial

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Water Budget Report

- Weather Adjusted Target Consumption
- Five Year Average
- Actual Consumption

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1600 W. 12th Avenue, Denver, CO 80204-3412
Phone 303-628-6000, Fax 303-628-6199, www.denverwater.org

November 18, 2013

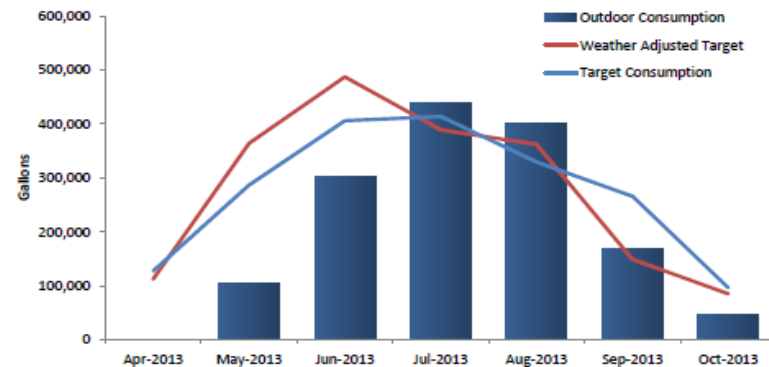
Bella Vista Villas 2013

Re: Water Budget Program - Drought Stage I

Due to a very wet spring our Board of Water Commissioners has adopted a resolution to move to Stage I drought. Under Stage I drought we are able to increase your allocation to the normal 18 gallons per square foot, but we are still asking for customers to reduce consumption by 10% as we are still in a drought. You may still irrigate your property any day of the week but not between the hours of 10 a.m. and 6 p.m. Please pay attention to the weather and reduce days per week or run times as rain and cooler weather occur.

This report is designed to monitor your actual water use as compared to your water budget. Staying within your water budget will help Denver Water meet its conservation goals. Please note that the new "Target" below is based off 18 gallons per square foot of irrigated area.

Target	Actual	Balance	% Remaining
1,924,269	1,458,000	466,269	24%



Visit www.denverwater.org/Conservation/WeatherReporting/ for information regarding irrigation requirements.

For questions regarding this program contact: waterbudget@denverwater.org

Thank you,
Denver Water Conservation

It's a drought. **USE EVEN LESS.**

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Water Use Education(WUE) field technicians have been used for years to educate customers on proper outdoor water usage.



Francis Rodriguez, one of the Drought Patrol crew members, stops at a house to educate customers about drought rules.



These techs are seasonal staff that change from year to year. Their job was essential for enforcement of our stage 2 drought restrictions.

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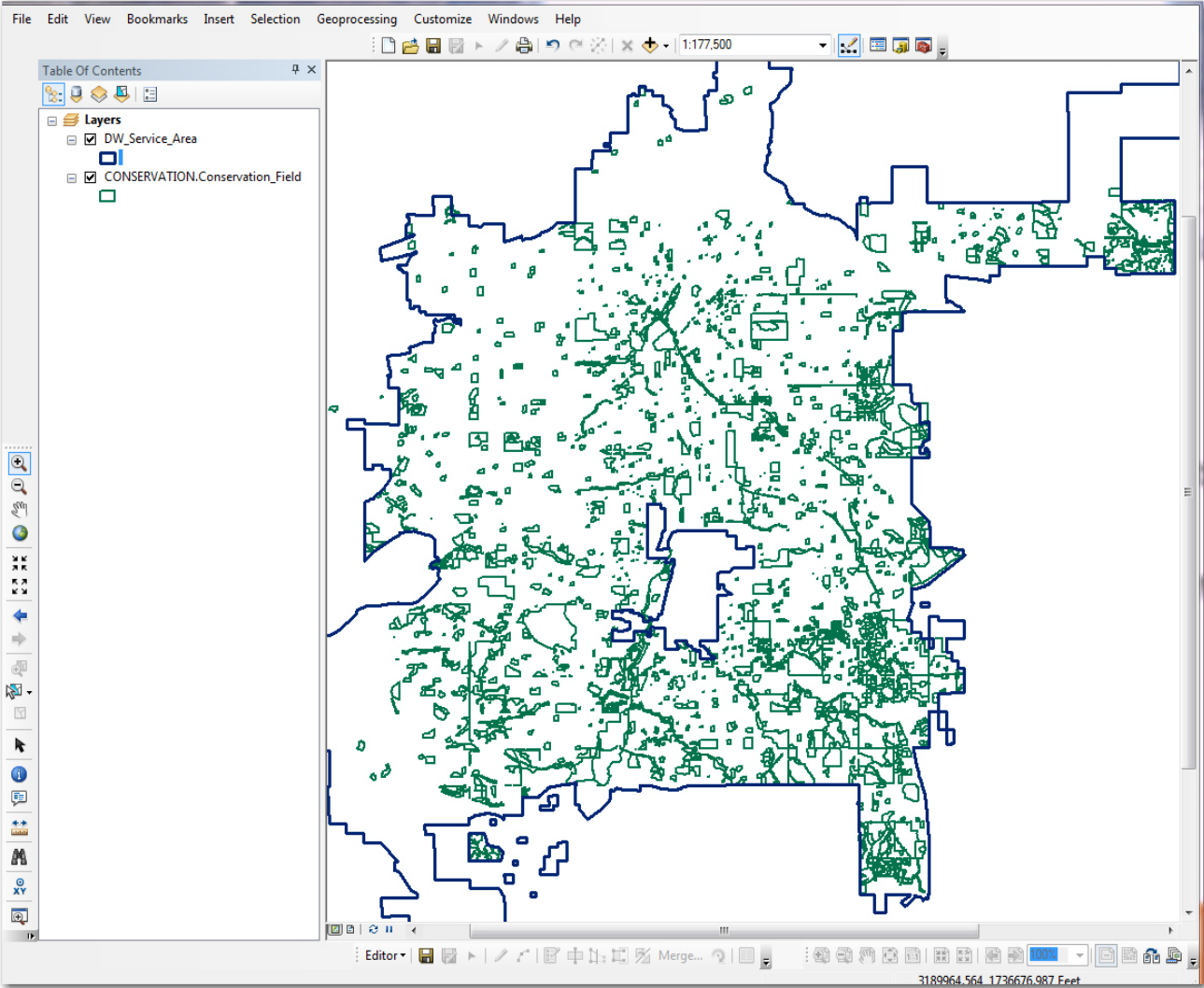
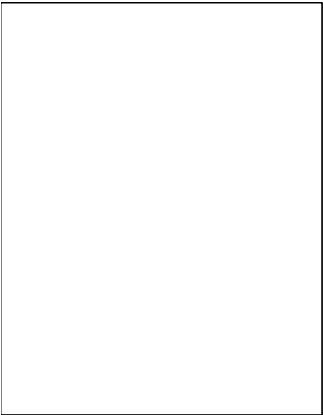
A problem WUE encounters is that it is difficult to determine who is the responsible party for each property – especially medians and streetscapes adjacent to parks and HOA's.



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- The WUE field staff needs to be able locate information that conservation staff is capturing directly from Water Budget Customers



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Solution:

Piggy back on existing mobile work force application and add a GIS layer of Water Budget properties

The screenshot displays a web application interface. On the left, a map shows a residential area with streets like W Mississippi Ave, W Florida Ave, W Jewell Ave, and W Morrison Rd. Green shaded regions on the map represent water budget properties. On the right, a data table lists work items with columns for Address, Priority, Schedule, Work Group, Current, Status, and Work Type. The table is filtered to show 3722 items. The status column includes labels like 'SUSPEND', 'ACKNOWLEDGE', 'ASSIGNMENT', and 'STARTED'.

Address	Pri	Schedule	Work Gro	Current	Status	Work Type
2799 E FREMONT PL (Ple)		2012 1:28	TDEAST	STONE, DI	SUSPEND	CM
W 10TH AVE & SHERIDAN		2012 4:42	TDEAST	GUTIERRE	ACKNOWLEDGE	CM
HOLLY PL & LOCUST		2012 3:18	TDEAST	GUTIERRE	ACKNOWLEDGE	CM
	adult		TDEAST	MORTON,	SUSPEND	STD
IN VALLEJO ST FROM 7	adult		TDEAST	LOMBARD:	ASSIGNMENT	IA
VARIOUS LOCATIONS	adult		TDEAST	LOMBARD:	SUSPEND	STD
VARIOUS LOCATIONS	adult		TDEAST	LOMBARD:	ASSIGNMENT	STD
VARIOUS LOCATIONS	adult		TDEAST	LOMBARD:	ASSIGNMENT	STD
VARIOUS LOCATIONS	adult		TDEAST	LOMBARD:	SUSPEND	STD
VARIOUS LOCATIONS	adult		TDEAST	LOMBARD:	ASSIGNMENT	STD
IN LEYDEN ST FROM 33	Prior		TDEAST	LOMBARD:	ASSIGNMENT	IA
MISC T&D EXPENSES 2	adult		TDEAST	CORDOVA	SUSPEND	STD
CAPITAL HILL PUMP ST	adult		TDEAST	CORDOVA	SUSPEND	STD
VALVES 2012 CENTRAL	adult		TDEAST	CORDOVA	SUSPEND	STD
VALVES OUTSIDE DEN	adult		TDEAST	CORDOVA	ASSIGNMENT	STD
	adult		TDEAST	CORDOVA	ASSIGNMENT	STD
	Prior		TDEAST	MCMANUS	ASSIGNMENT	IA
foothills treatment	Prior		TDEAST	MCMANUS	SUSPEND	CM
Foothills Water Treat	adult		TDEAST	MCMANUS	STARTED	CM
	Prior		TDEAST	MCMANUS	ASSIGNMENT	CM
	Prior		TDEAST	MCMANUS	SUSPEND	CM
Marston/Foothills	Prior		TDEAST	MCMANUS	ASSIGNMENT	STD
VARIOUS LOCATIONS	adult		TDEAST	KIPPES, R.	ASSIGNMENT	STD
VARIOUS LOCATIONS	adult		TDEAST	KIPPES, R.	SUSPEND	STD
VARIOUS LOCATIONS	adult		TDEAST	KIPPES, R.	ASSIGNMENT	STD
IN VINE ST FROM E 37	Prior		TDEAST	KIPPES, R.	SUSPEND	IA
NEC 27TH & VINE	Prior		TDEAST	KIPPES, R.	ASSIGNMENT	IA
NEC 28TH & VINE	Prior		TDEAST	KIPPES, R.	ASSIGNMENT	IA
29TH & VINE NEC	Prior		TDEAST	KIPPES, R.	ASSIGNMENT	IA
NEC 30TH & VINE	Prior		TDEAST	KIPPES, R.	ASSIGNMENT	IA
	Prior		TDEAST	DEHERRE	ASSIGNMENT	CM

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A boundary layer of Water Budget customers was loaded into the mobile workforce app to help our field techs correctly identify the properties on location.



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By clicking on a boundary, field staff are able to determine the correct owner of a location.

This ensured that water use violations or leaks could be assessed accurately.



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A look at the attribute table shows what information was available to the field staff in the GIS layer. The first contact # is for the landscaper and the second # is for the property manager. The tap number is used to generate a Field Activity (FA) in our Customer Care & Billing (CC&B).

GRP	ACCOUNTNAM	ADDRESS	TAP_NUMBER	CONTACT_1	CONTACT_2
5563A	CENTENNIAL @ RIVERWALK	2894 W RIVERWALK CIR	X32849	303-761-9262	303-948-8198
5565A	DAKOTA STATION HOA	9648 W CHATFIELD AVE	281779	303-478-5552	303-339-9715
38A	SAN FRANCISCO WEST HOA	3121 S ESTES ST	275501	303-356-4112	303-980-7446
949A	CLUB TERRACE HOA	9252 MILES DR	295541	303-472-5514	303-755-2732
476A	PHEASANT CREEK HOA	10102 W DARTMOUTH AVE	285110	303-693-3072	303-952-9257
2142C	PTARMIGAN AT CHERRY CREEK	3773 E CHERRY CREEK NORTH DR	271712	720-732-7443	303-321-5010
2147C	PARKWAY POINT	8200 E PARK MEADOWS DR	299445	303-750-8867	720-528-7208
2242C	DENARGO MARKET	3250 WEWATTA WAY	73728	303-912-6975	303-987-0835
5097A	HIGHLAND VIEW II	8180 S FILLMORE CIR	285644	303-761-9262	303-369-1800 x123
2125C	DIAMOND HILL OFFICE PARK	2420 W 26TH AVE	201026	303-761-0444	303-458-0800
447C	SOUTHGATE BUSINESS COMMONS	7006 S ALTON WAY	259209	303-814-6070	303-741-2703
17A	WOODRIDGE TERRACE HOA	1443 E NICHOLS CIR	279073	303-693-3072	303-745-2220
126A	WOLHURST LANDING HOA	7101 S BRYANT ST	268702	303-257-3594	720-257-3594
646C	CREEKSIDE AT AMHERST	7510 W AMHERST AVE	201019	303-693-3072	303-986-9572

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Lessons Learned

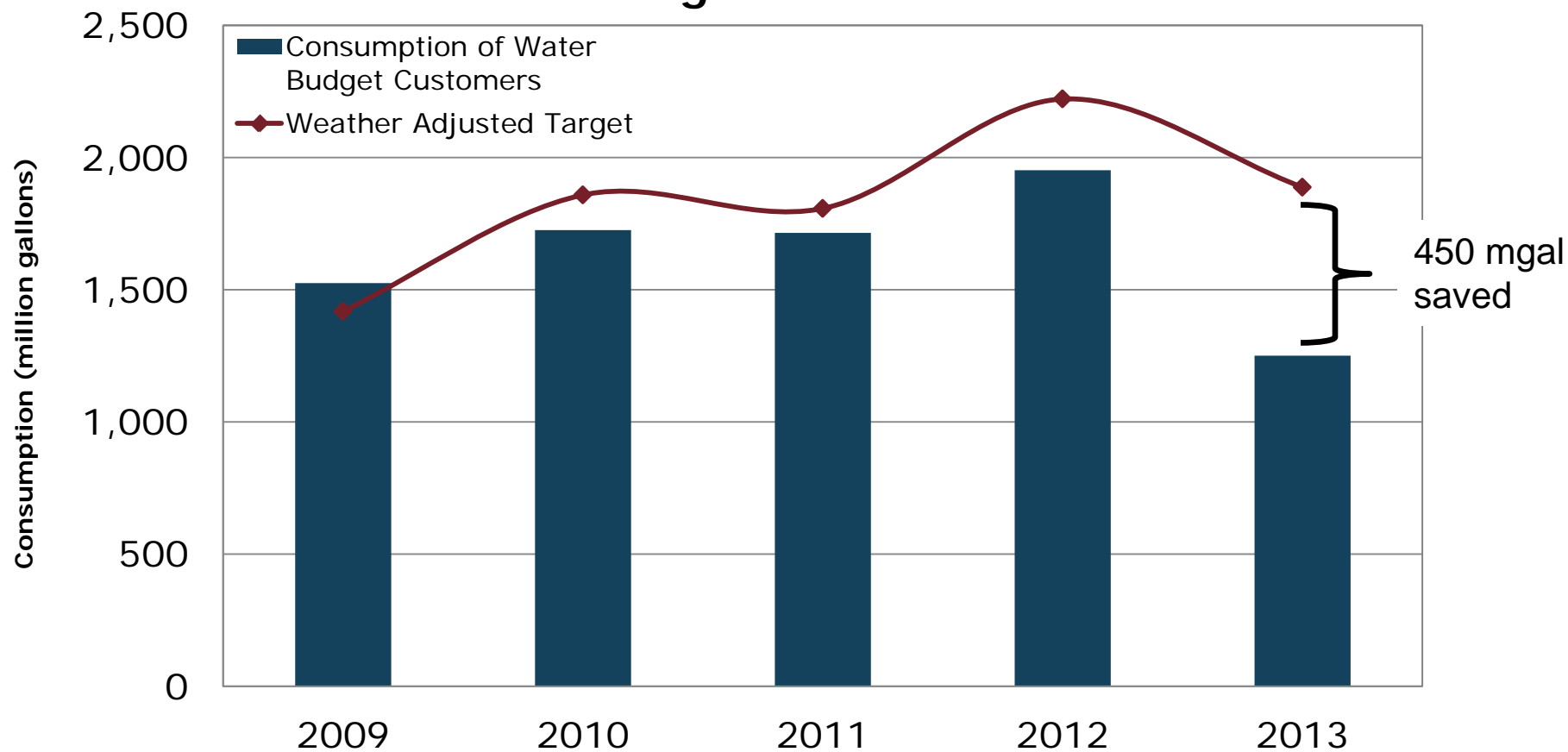
- Was the right tool to manage drought response for large customers:
EXEMPTIONS and ENFORCEMENT!
- Billing system did not have the answers.
- Customers want this!

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Lessons Learned

Savings Attributed to Commercial Water Budget Customers



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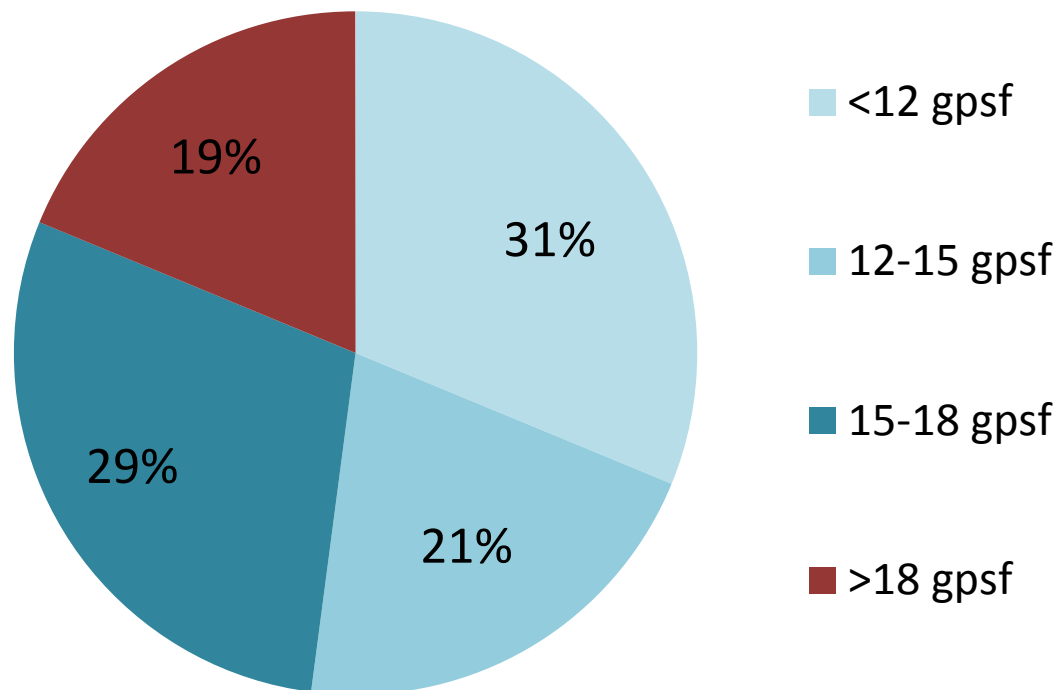
Questions?



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Commercial Water Budget Customer Use Classification



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Thank you for participating in the Water Budget Program. The following is your customized water usage profile for 2014. Our goal is to provide our customers a baseline for efficient water use, helping to define "Use Only What You Need".

Customer Name:

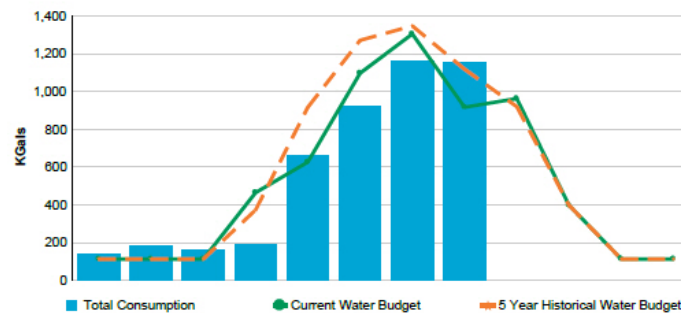
Address:

Est. Irrigated Sq.Ft. 178,991

To-Date Gallons Per Sq.Ft.	11.15	GPSF
To Date Allowable Budget	5,713	kgals
To Date Consumption	4,570	kgals

To Date % of Budget 80%

Water Use Categories	kgals	%
Indoor	1,026	18%
Other Indoor	0	0%
Irrigation	2,749	48%
Cooling Tower	1,937	34%
Total	5,713	100%



	1	2	3	4	5	6	7	8	9	10	11	12
Indoor Budget	114	114	114	114	114	114	114	114	114	114	114	114
Total Outdoor Budget	0	0	0	351	513	682	1,190	802	848	284	0	0
Current Water Budget	114	114	114	465	627	1,066	1,304	916	962	398	114	114
Total Consumption	143	180	161	192	660	923	1,159	1,152	0	0	0	0
% of Monthly Budget	125%	158%	141%	41%	105%	84%	89%	126%	0	0	0	0

For questions regarding this program visit www.denverwater.org/conservation/waterbudget or email waterbudget@denverwater.org.

Thank you,

Denver Water Conservation Team

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