



Recycled Water Demand Prioritization and Management; Maximizing Beneficial Use

WaterReuse Inland Empire Chapter
January 27, 2014

John Wuerth
Recycled Water Program Analyst

Agenda

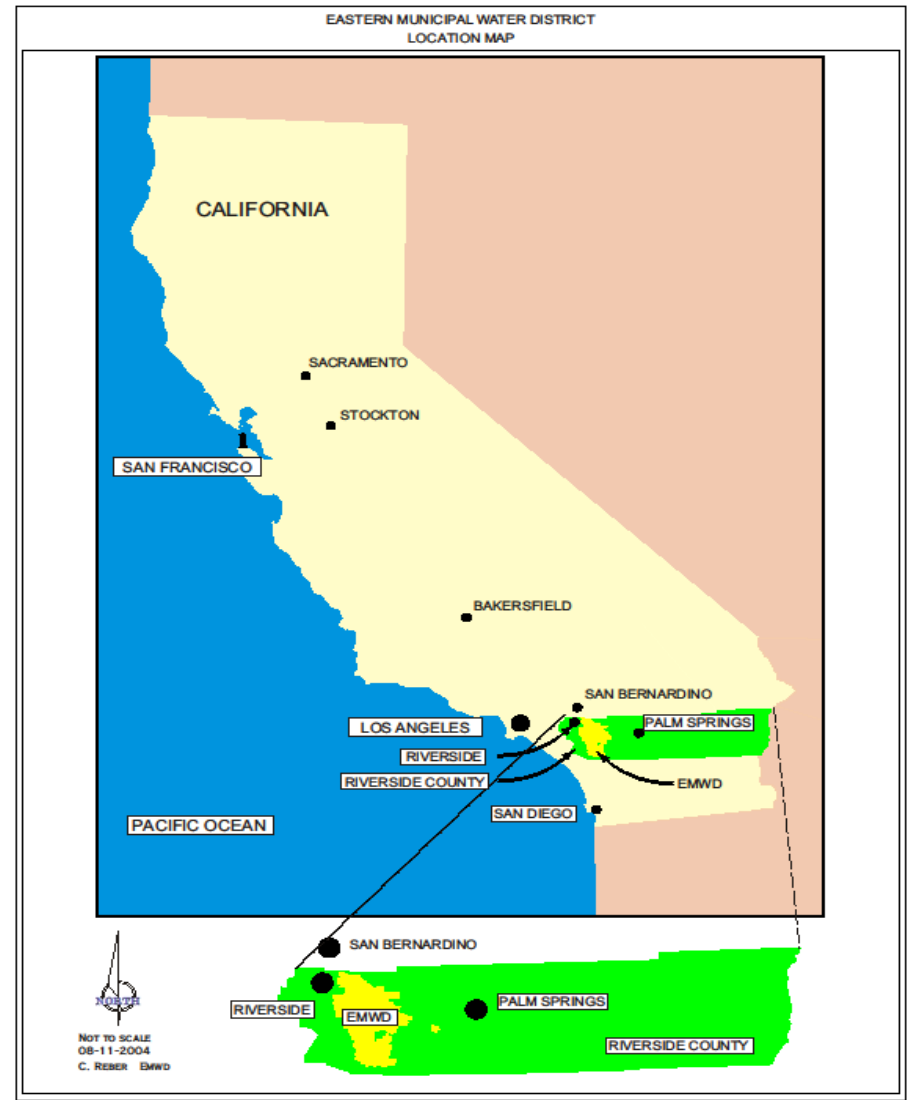


- Eastern Municipal Water District (EMWD) and Recycled System Overview
- September 2011 System Conditions
- Demand Management Plan
- Results
- Challenges
- Opportunities

EMWD Overview



- 542 Square Miles
- Population of 768,000 / 45% Ultimate Build-out
- Water, Wastewater and Recycled Water Services
- 7 Cities plus Un-incorporated Riverside County



Recycled Water System History



- EMWD Began Treating Wastewater in the 1960's
- Originally Disposed in Ponds & Fields
- In 1991, Began To Develop a Recycled Water "Backbone" to Expand Reuse



San Jacinto Valley RWRP 1960's



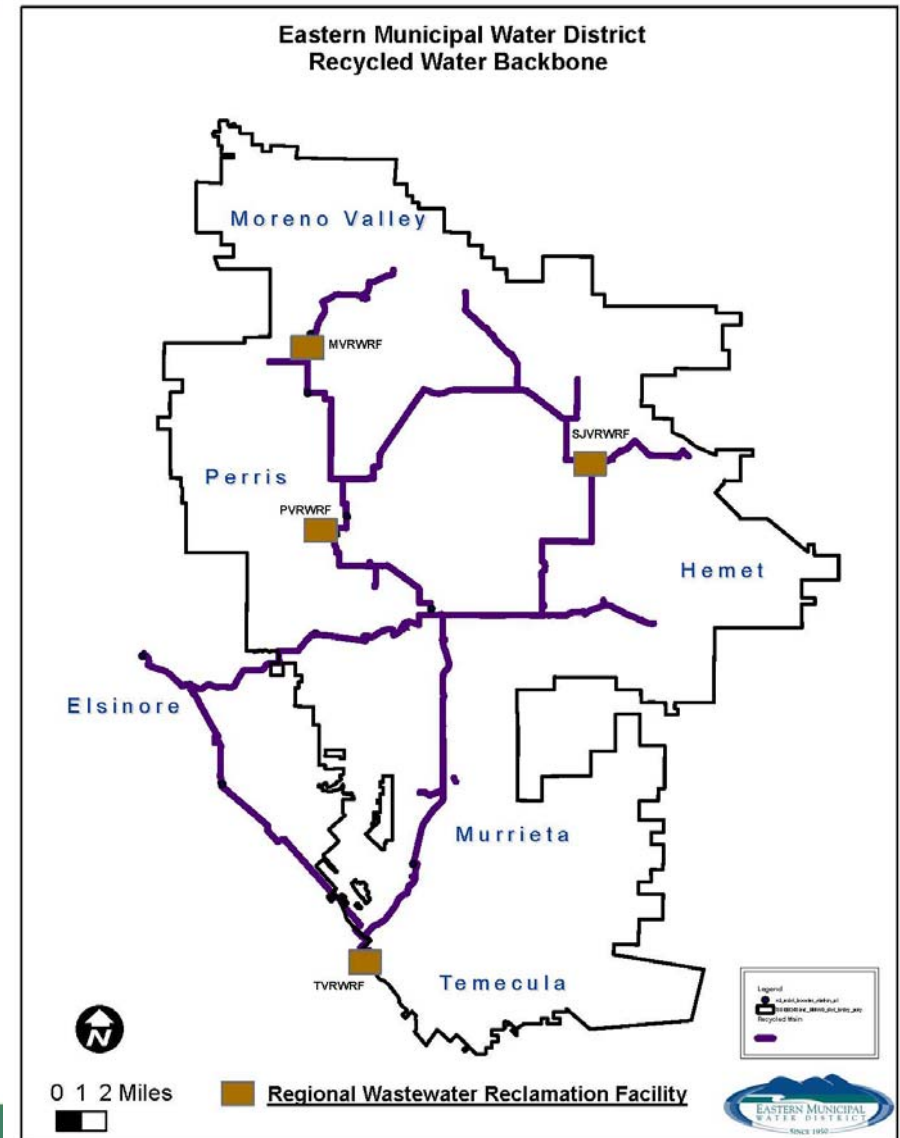
Recycled Water System History



- Four Operating RWRf's
- Two Billion Gallons of Storage
- Over 200 Miles of Pipeline
- All RWRf's Connected

Since 2003 – Increase Demands:

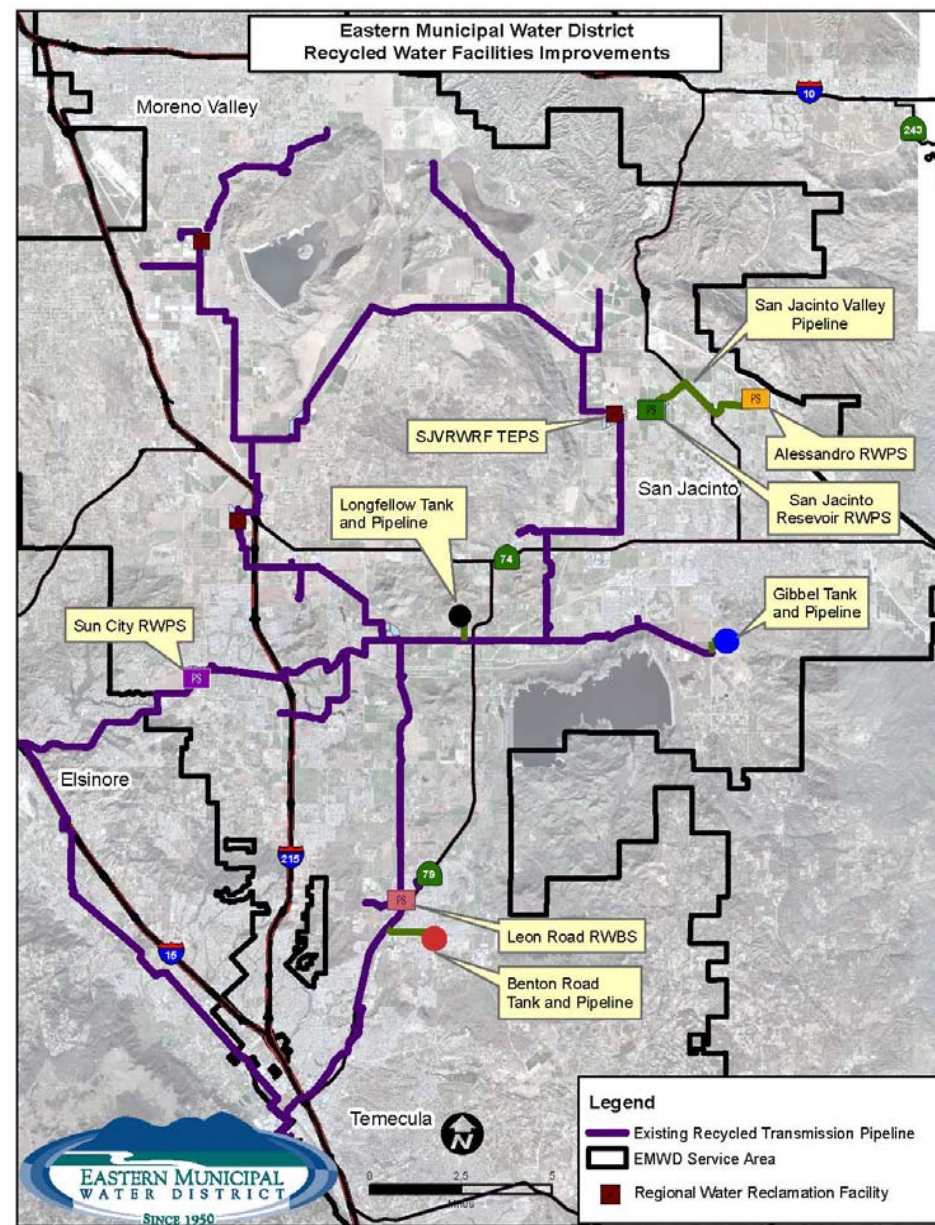
- System Pressurization
- Mandatory Use Policy
- RW Strategic Plan
- Facilities Master Plan
- Operations Plan



The Current Recycled Water System



- \$50M Improvements
 - American Recovery and Reinvestment Act - \$12M
- Recently Completed:
 - 5 MG Converted Tanks
 - 11 MG New Tanks
 - 2 – In Line Boosters
 - 5 – Miles 36-Inch Pipeline
- Currently Constructing:
 - 3 – Pond Pump Stations
- In Design:
 - 1,500 AF New Seasonal Storage
 - Storage Optimization Study

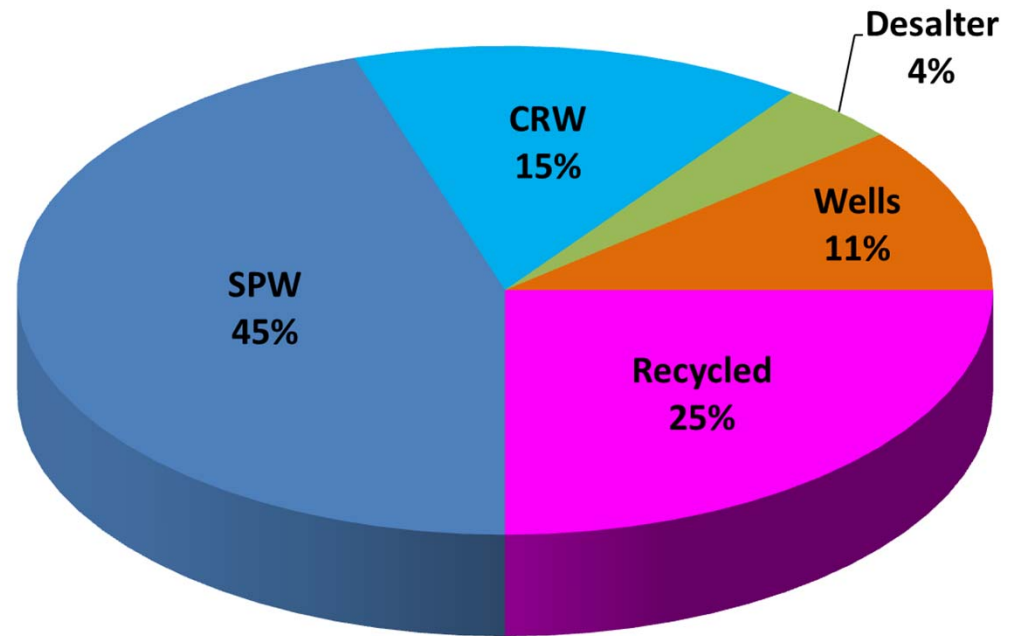


Path: J:\2. RECYCLED WATER RE-OROVRECYCLED WATER MASTER PLAN\RECYCLED WATER 015 MAPS\120RW_RecoveryAct_ARRA_overview_080812.mxd

Recycled Water's Role



- 90% Current Reuse
- 25% Total Water Supply
- RW Planning Objectives:
 - Maximize Beneficial Use
 - 100% Utilization
 - Optimize Salt Balance
 - Minimize Cost
- Primary “New” Supply



The Start of Demand Management



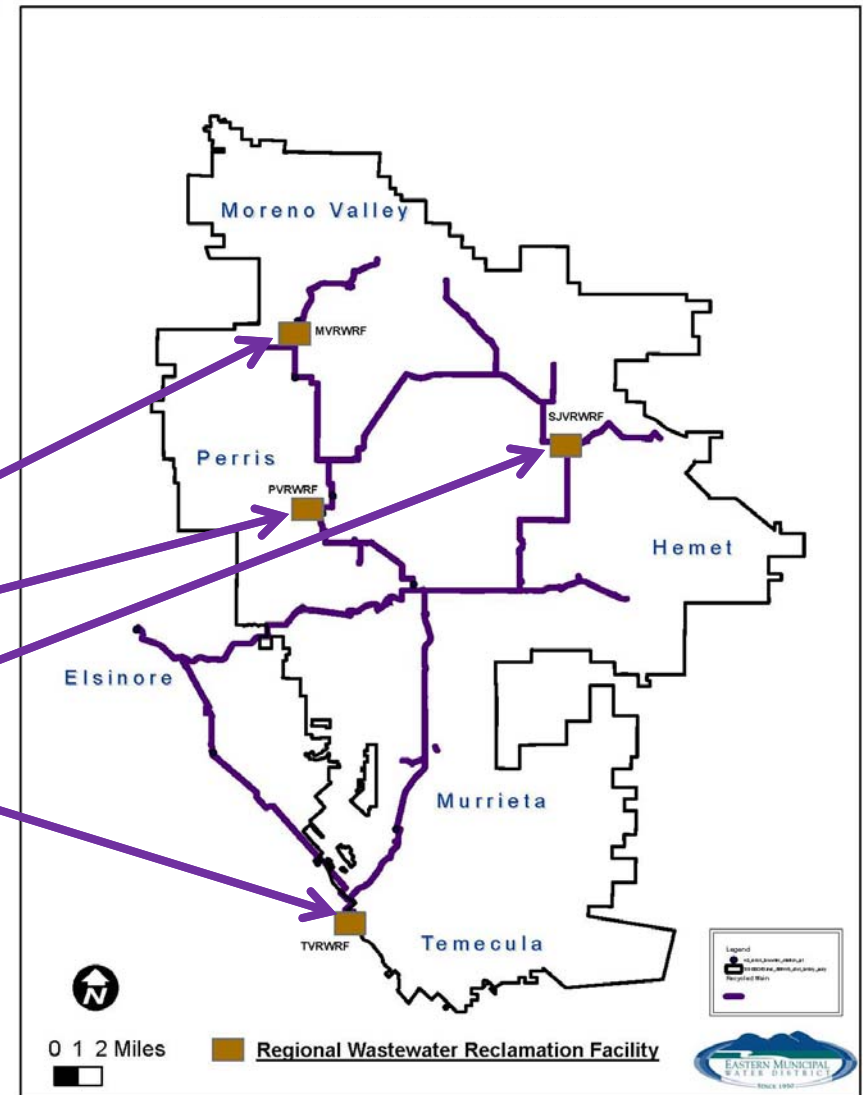
- System Conditions – September 2011:
 - High Demands
 - System Pressures Dropped
 - Customer Supply Shortages
 - Required System Augmentation
- Demand Management Plan Initiated:
 1. Evaluate Supply, Commitments, and Demands
 2. Classify / Analyze Customer's Needs
 3. Develop Customer Allocations
 4. Develop Demand Monitoring Tool
- Primary Focus: What Happened, Why and Prevent

Recycled Water Production Supplies



Recycled Water Annual Production (GPM)

Facility	Production (09-11 avg)	Average Rounded Flow
MVRWRF	9.6 MGD	6,725
PVRWRF	10.4 MGD	7,275
SJVRWRF	8.2 MGD	5,725
TVRWRF	13.3 MGD	9,275
Total	41.5 MGD	29,000



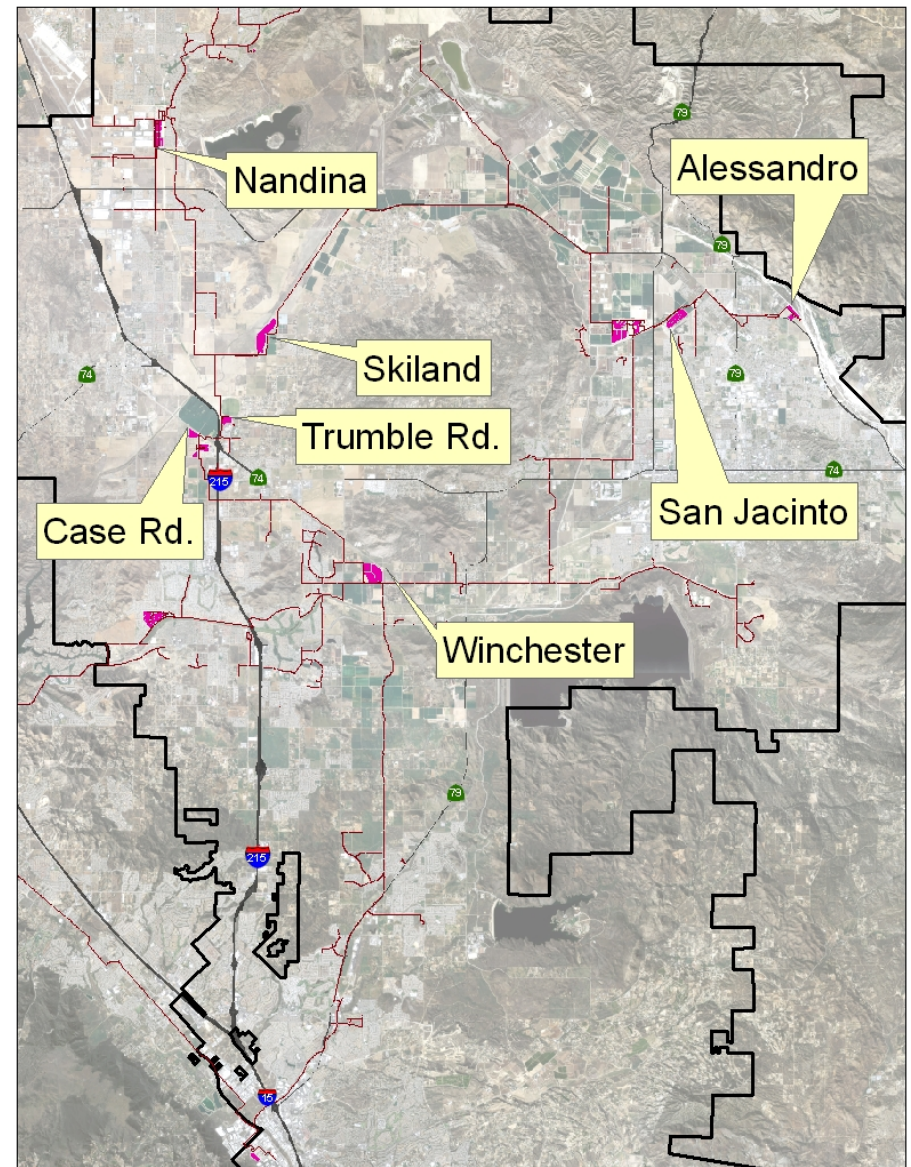
Recycled Water Storage Supplies



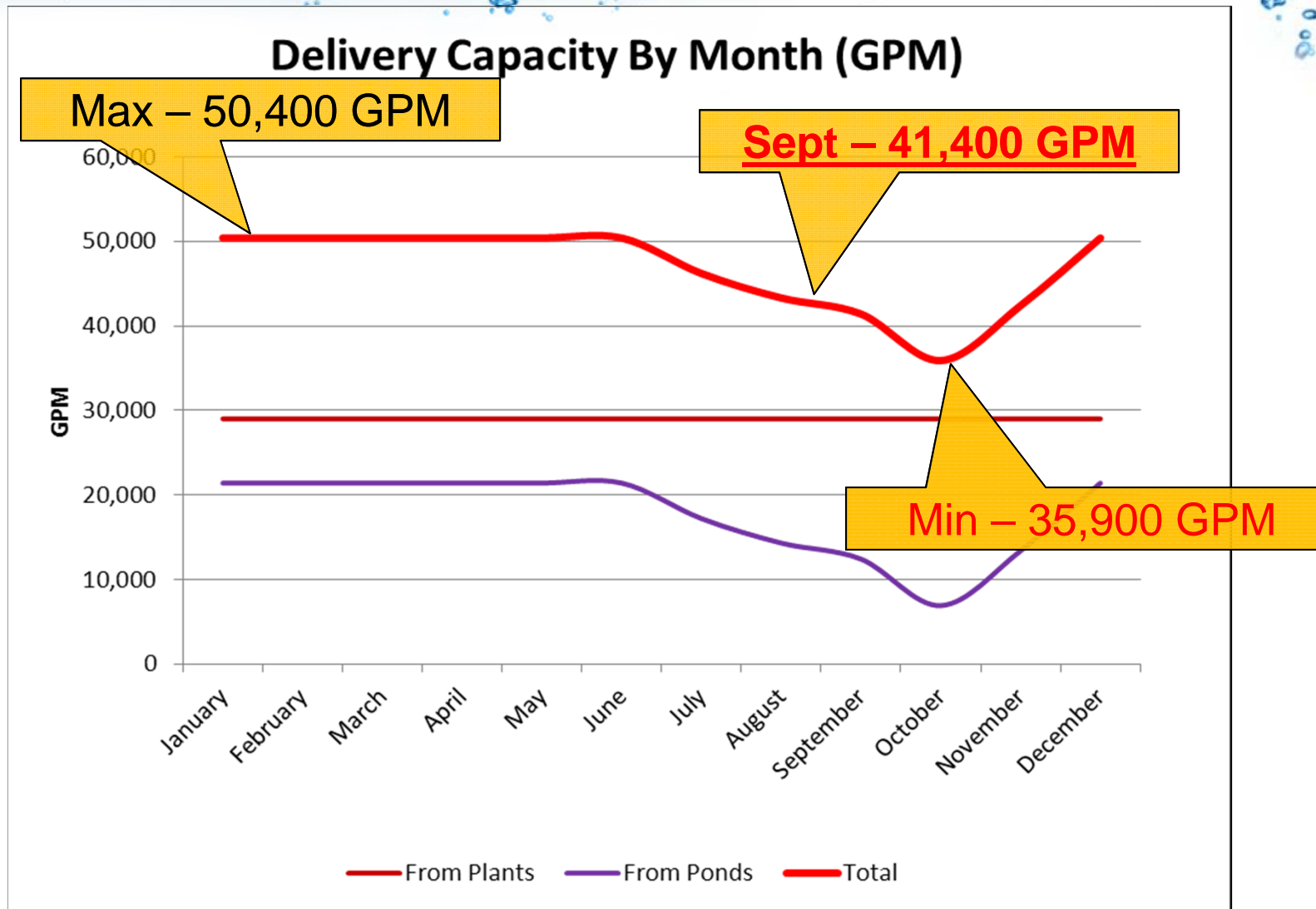
Storage Pond Delivery Capacities

(GPM)

Pond Site	Capacity
Nandina Pump Station	4,200
Skiland Pump Station	1,900
Case Rd. Floating Pump	1,900
Trumble Rd. Floating Pump	1,900
Winchester Caisson Pumps	6,500
Winchester Floating Pump	1,000
MWD Ponds Pump Station	1,000
Alessandro Pond Gravity Pipe	3,000
Total	21,400



Total System Delivery Capacity



Commitments

“Allocated” and
“As-Available”

Manual Reads

Max Daily Supply & Demand (GPM)			
	Contract	Actual Use (Meter Reads) Sept. 19-20)	Max Day (Sept.) Available Supply
Ag	40,220	19,808	
Ag In-Lieu	8,500	3,900	
Golf	3,300	2,800	
Landscape	-----	5,000 (estimate)	
Rec/Env.	9,250	7,370	
Industrial	5,000	3,500	
Wholesale	2,650	2,600	
Constr	-----		
Total	68,920	44,978	41,400

Other Contributing Factors



Challenges:

- Customer flows exceeded allocations
- Pressure fluctuations changed flow conditions
- RWRf Maintenance / construction activities
- Manual meter read process
- Storage pond pumping constraints

Immediate Mitigation Measures:

- Augmentation
- RWRf coordination
- Frequency of manual reads
- Customer coordination



Customer Analysis

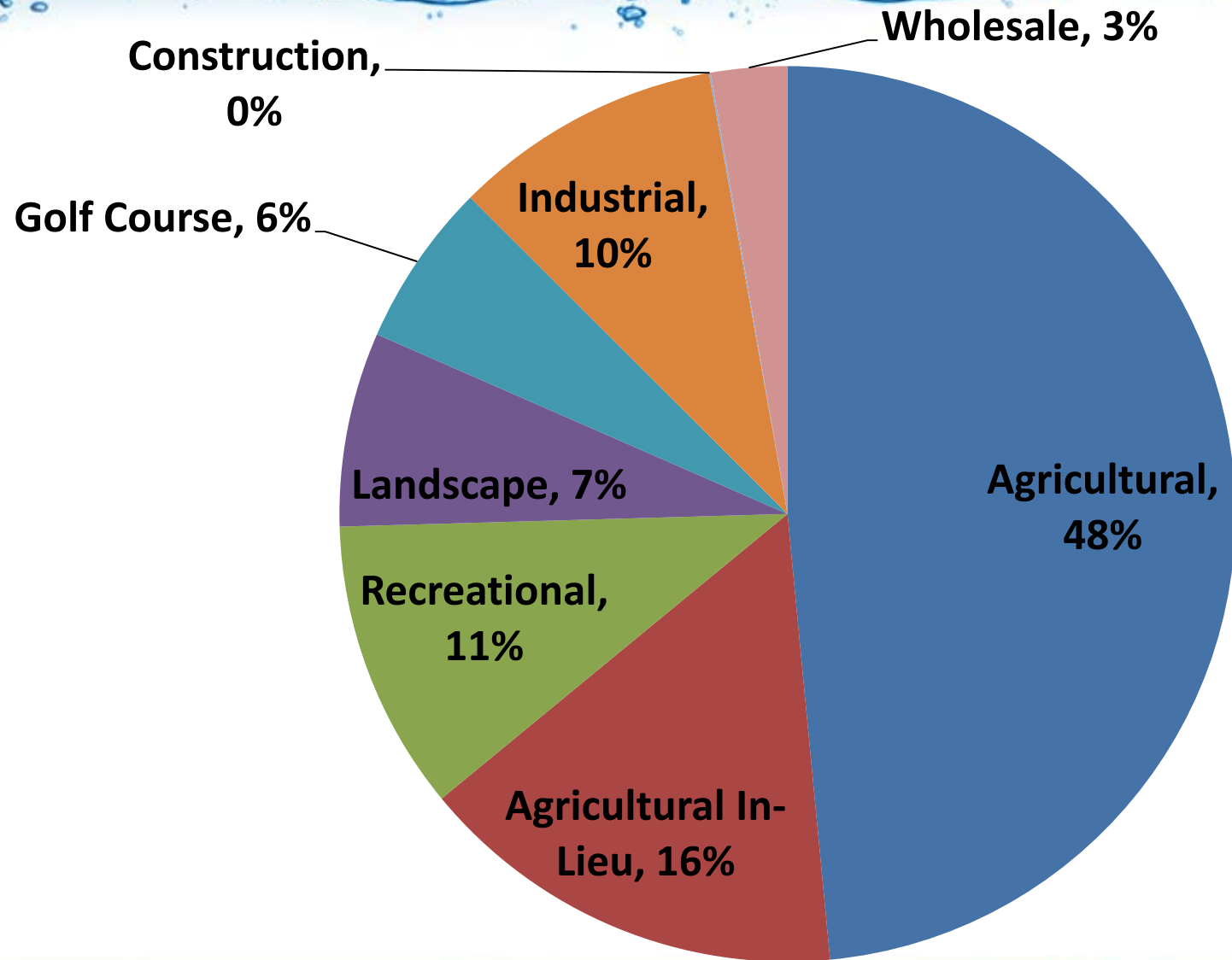


- Classify Customers
 - Level of Service

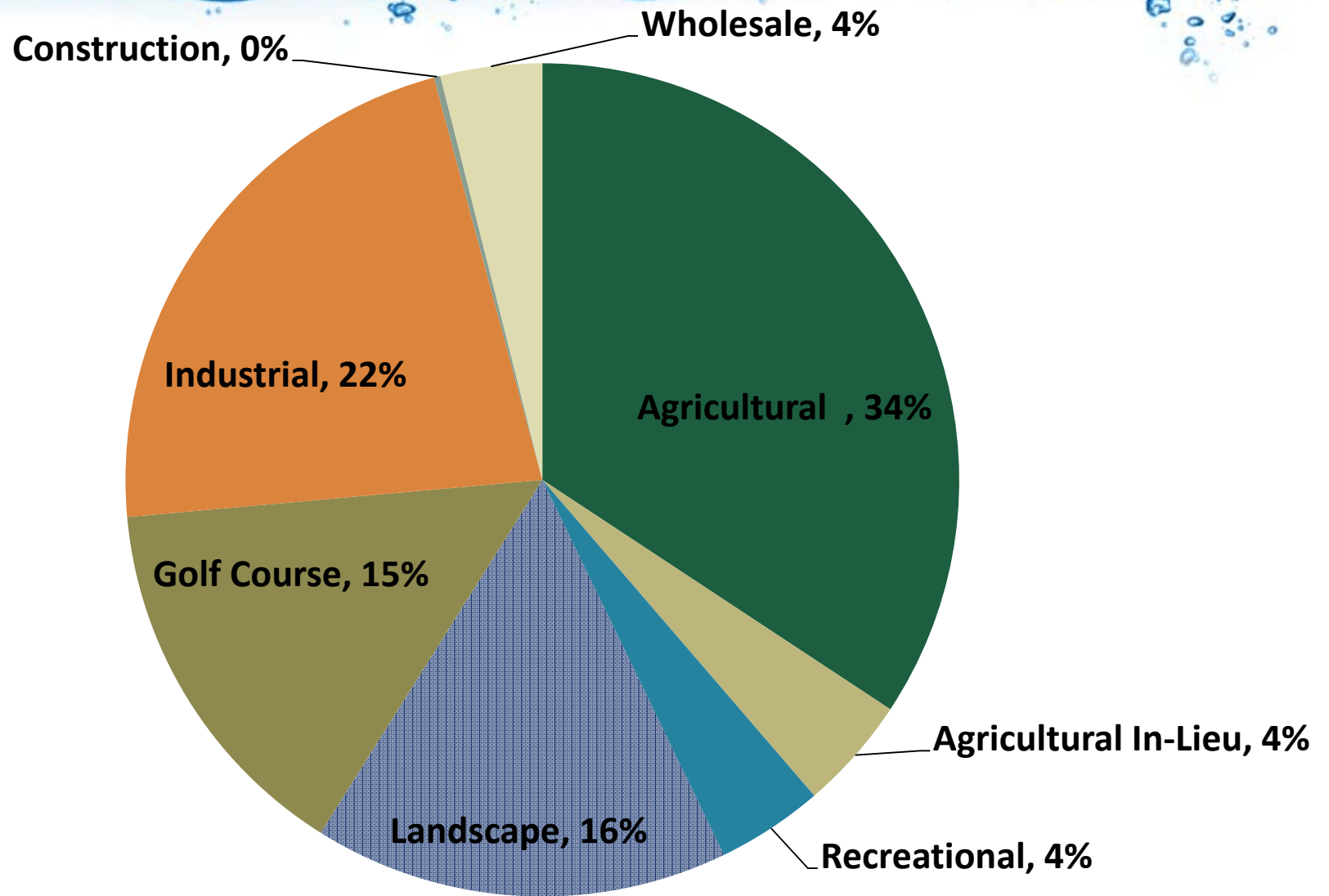
- Analysis – 2010/11 Usage Data
 - Seasonal curve
 - % Total Demand
 - % Total Revenue
 - % of Commitment
 - % Total Demand within Summer Months

1. *Agricultural*
2. *Agricultural In-Lieu*
3. *Recreational*
4. *Landscape*
5. *Golf Course*
6. *Industrial*
7. *Wholesale*
8. *Construction*

% Total Sales



% Total Revenue



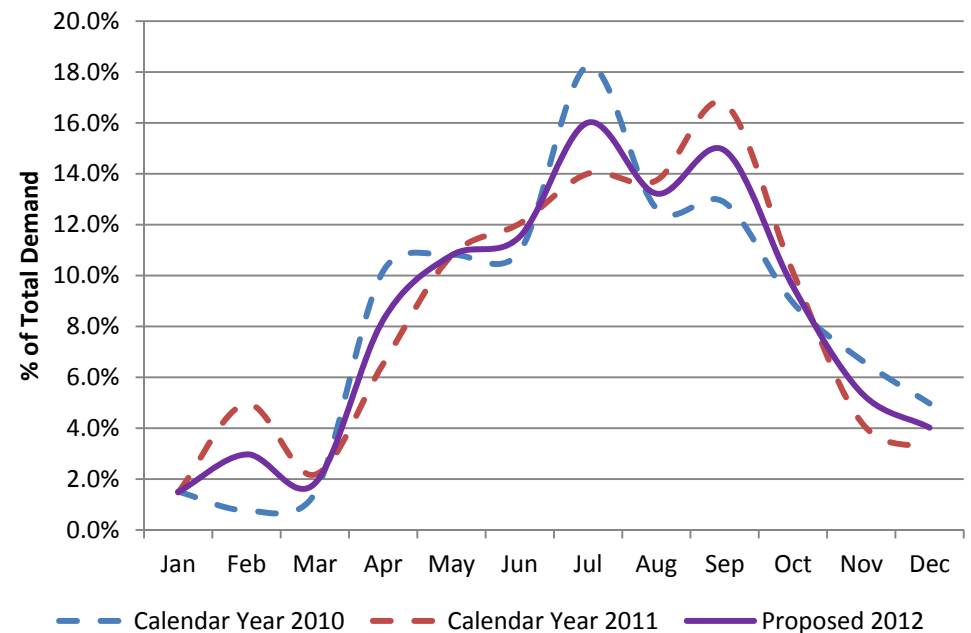
Agricultural



- “Legacy” Customer
 - 24-hour water window
- 48% Total Sales
- 54% Utilization of Contract
- 34% Total Revenue
- 49% in Summer Months



Agricultural Seasonal Distribution

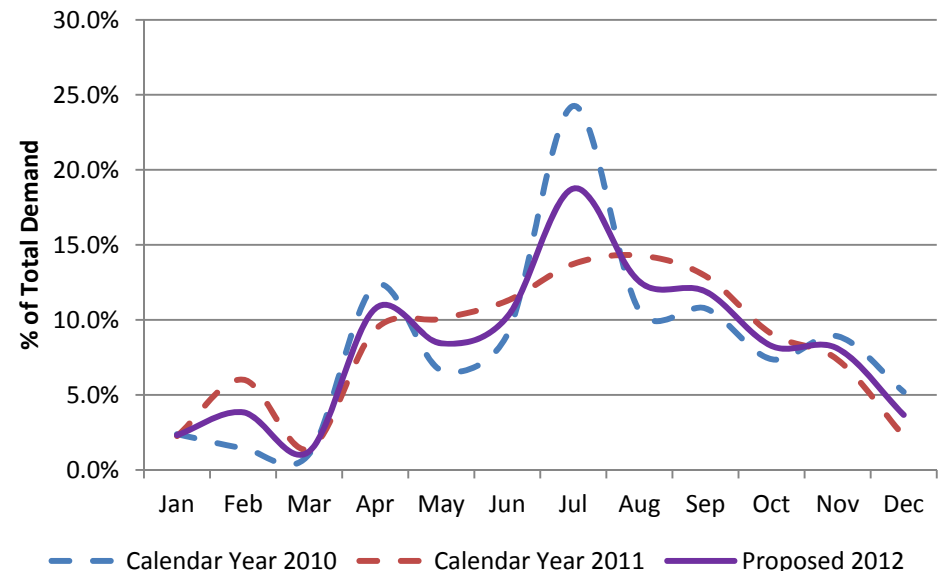


Agricultural In-Lieu



- “Ground-water” Customer
 - 2012 California Customer of the Year – Bruce Scott
- 16% Total Sales
- 53% Utilization of Contract
- 4% Total Revenue
- 47% in Summer Months

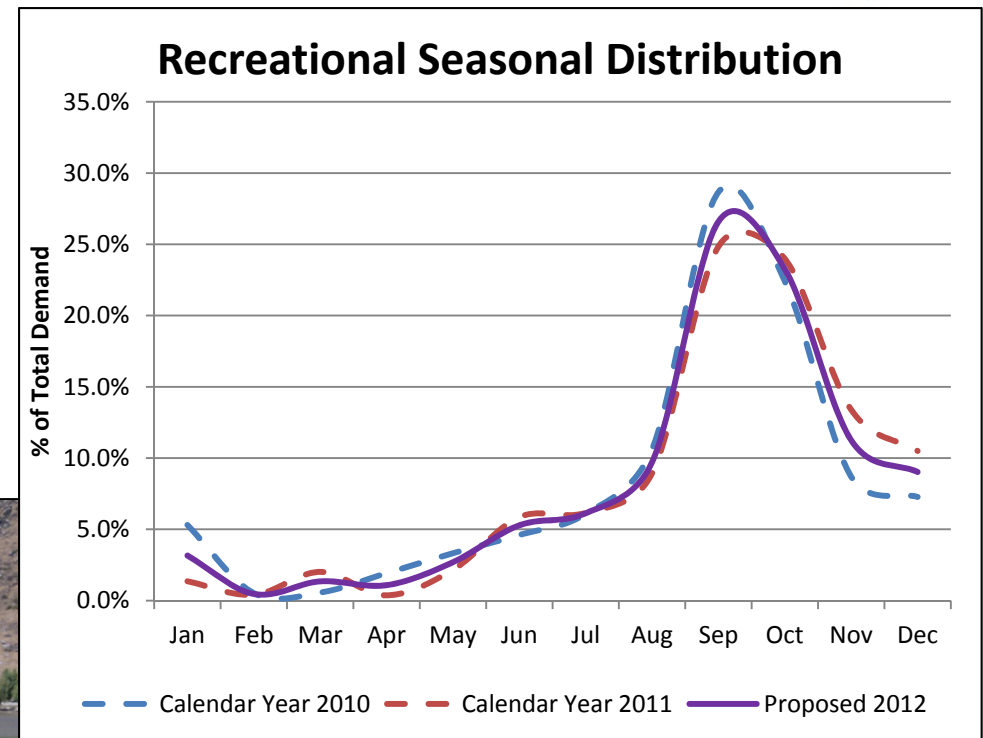
Agricultural In-Lieu Seasonal Distribution



Recreational



- Duck Clubs / DF&W
 - 24-hour water window
- 11% Total Sales
- 76% Utilization of Contract
- 4% Total Revenue
- 54% in Summer Months



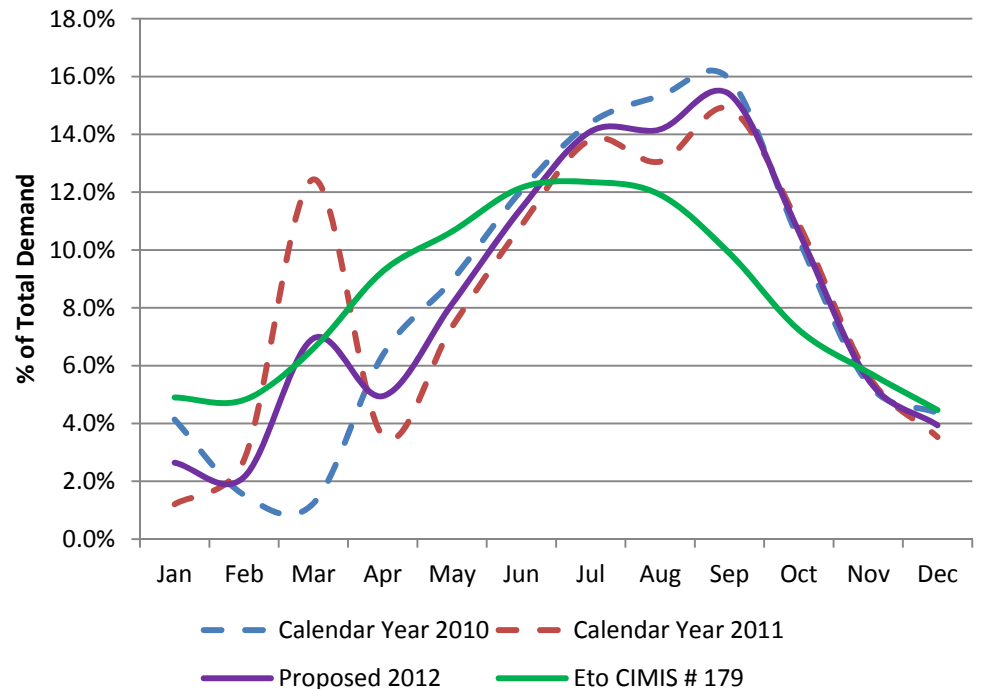
Landscape



- Common Areas
 - 9-hour water window
 - 2011 California Customer of the Year – Valley Wide
- 7% Total Sales
- 16% Total Revenue
- 49% in Summer Months



Landscape Seasonal Distribution



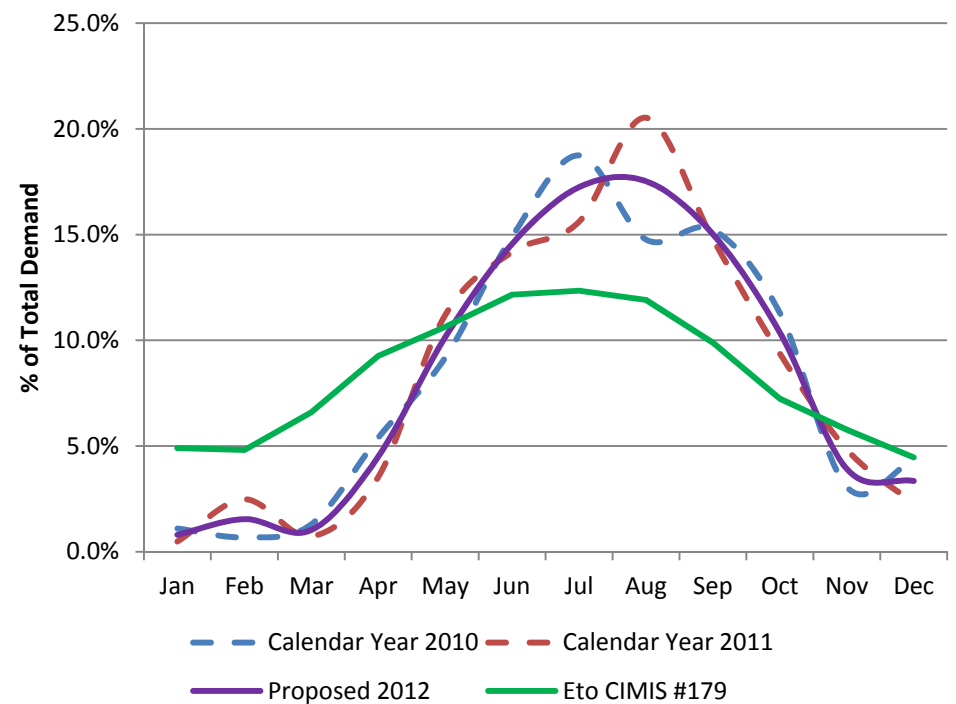
Golf Courses



- Six Customers
 - 24-hour take
- 6% Total Sales
- 15% Total Revenue
- 55% in Summer Months



Golf Course Seasonal Distribution



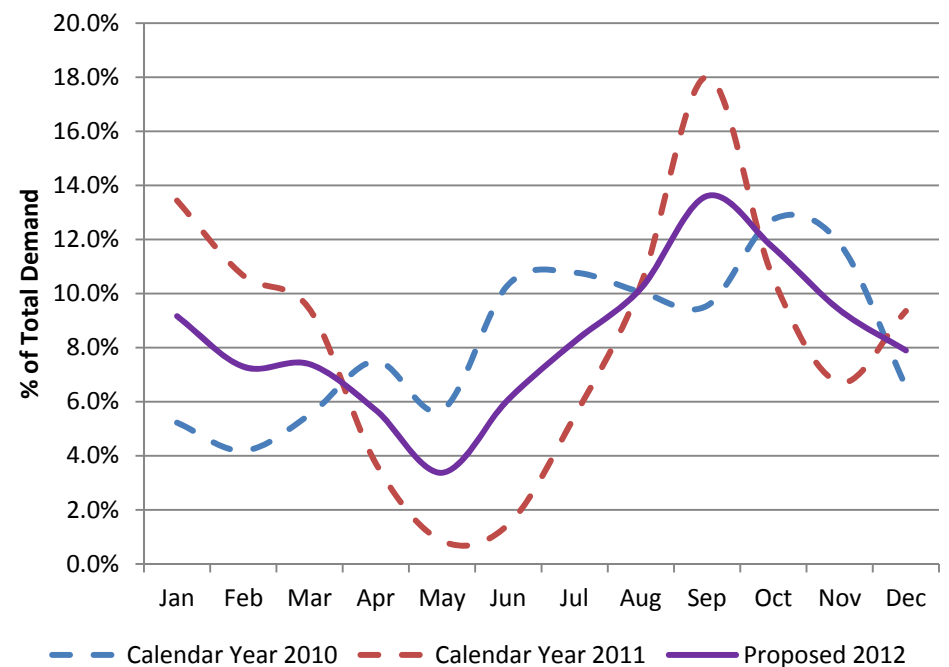
Industrial



- Cooling Towers
 - 24-hour take
- 10% Total Sales
- 59% Utilization of Contract
- 22% Total Revenue
- 38% in Summer Months



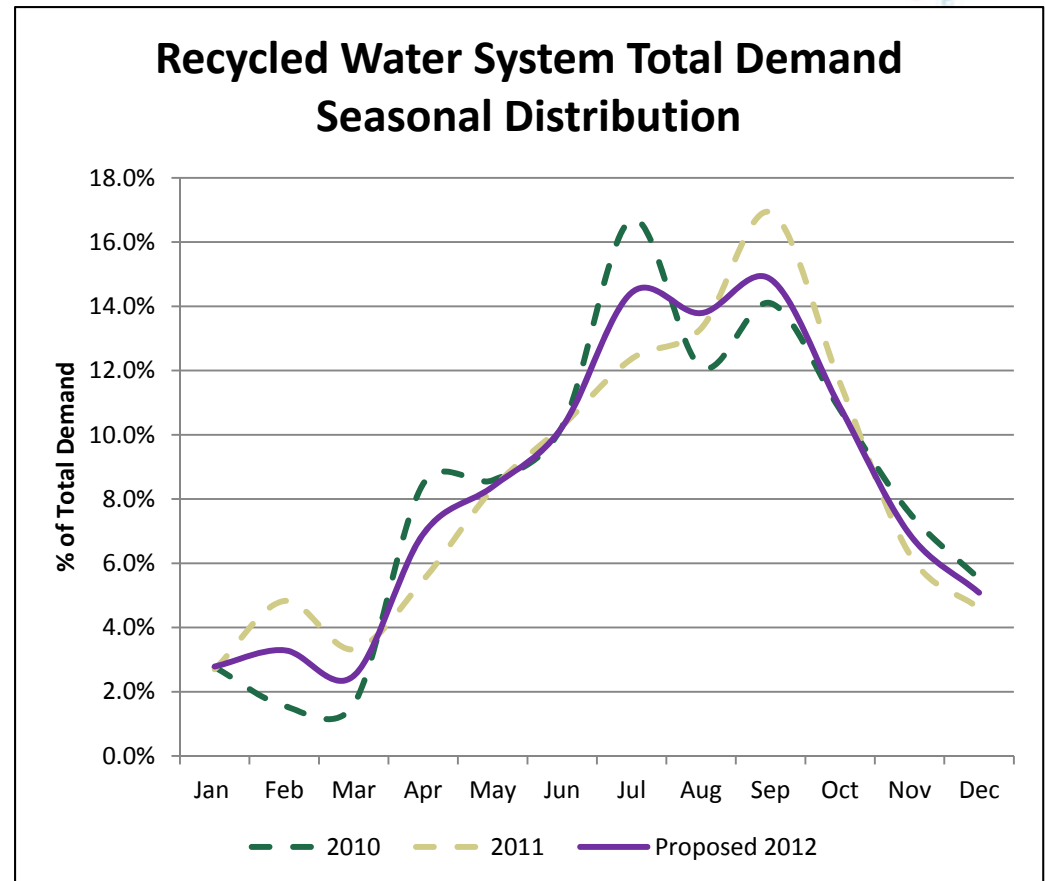
Industrial Seasonal Distribution



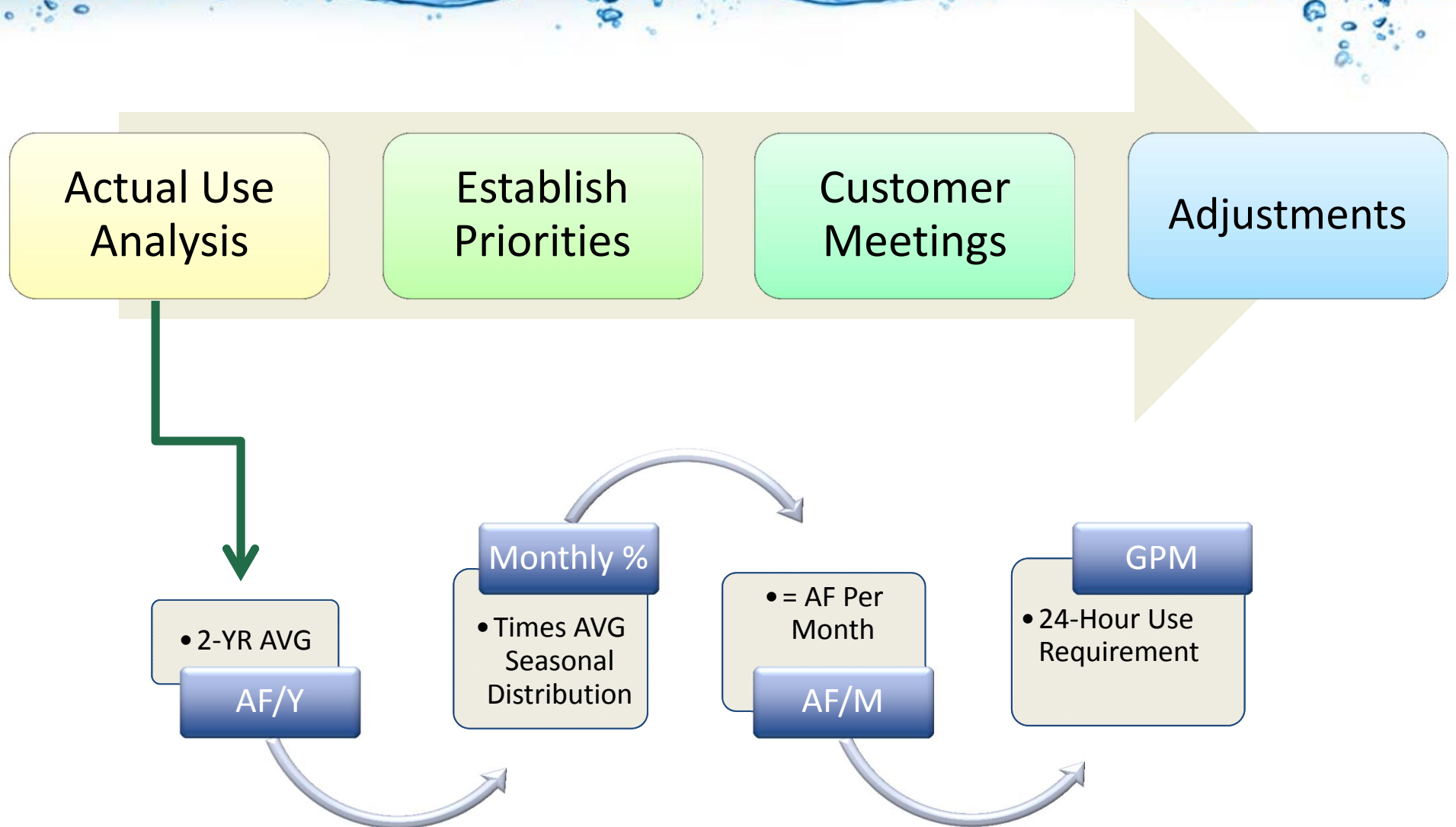
Key Objectives for 2012/13



- Re-allocate Supplies Based on Actual Use
- Minimize Diurnal Peaking
- Flatten Seasonal Peak
- Establish Customer Priorities



Customer Allocations

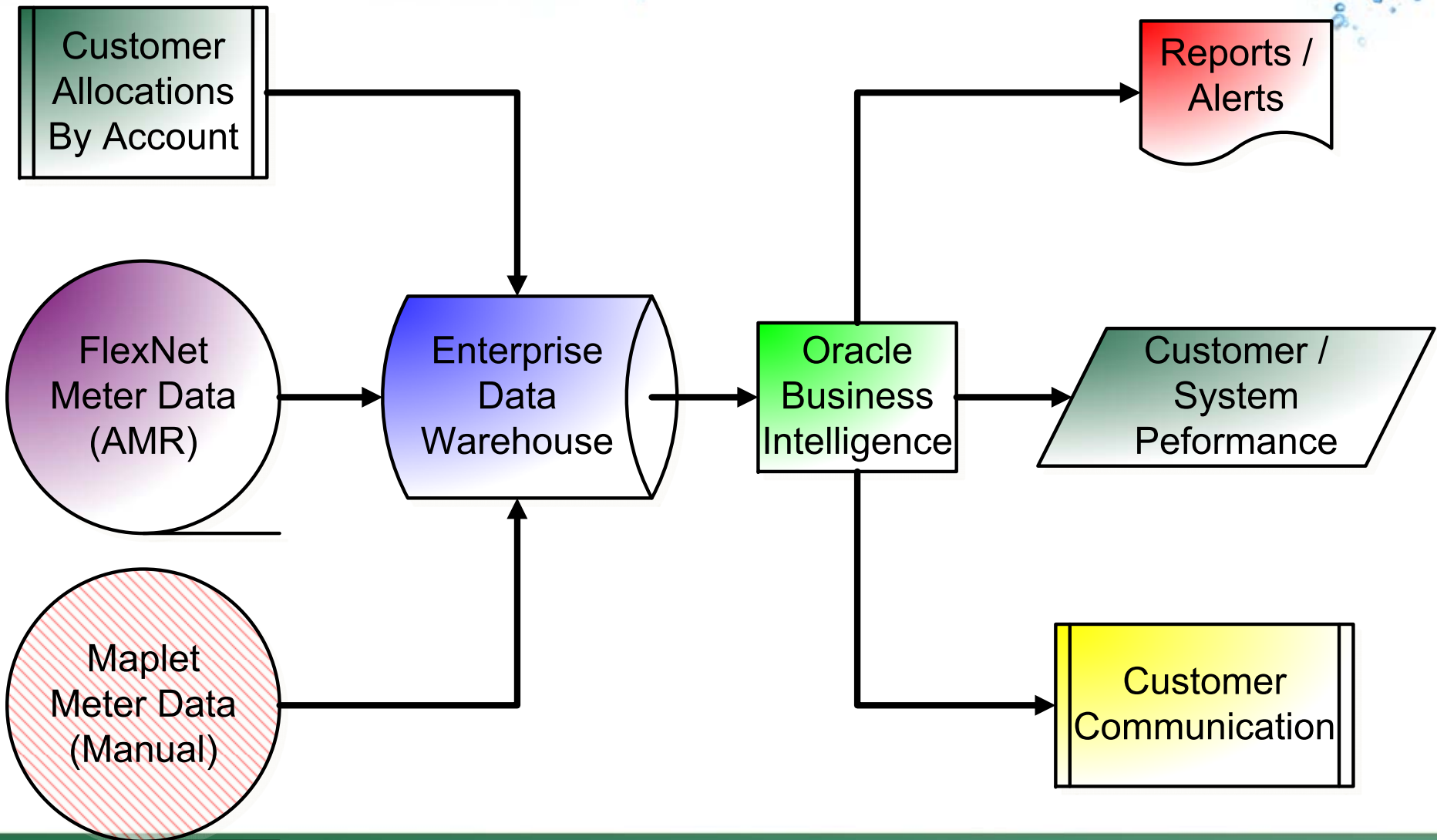


2013/2014 Allocation Priorities



- Priority 1- Long-term Contractual Obligations
- Priority 2 – Landscape and Golf Course
- Priority 3 – “Demand” Agricultural
- Priority 4 – Existing Agricultural & Recreational
- Priority 5 – New Agricultural & Recreational

Demand Monitoring



Reports / Alerts



Calendar Date

09/10/2013

Apply

Reset

FLEXNET

Monthly Usage vs. Allocation

of Customers that Exceeded Allocation

of Water Window Violations

Allocation (GPM)	Flow (GPM)
36,230	24,513

Total # of Reads	# Exceeded
219	9

of Water Violations
565

FIELD MAPPLET

Monthly Usage vs. Allocation

of Customers that Exceeded Allocation

Allocation (GPM)	Flow (GPM)
3,294	1,007

Total # of Reads	# Exceeded
14	1

Top N Users Over Budget By Customer and Day - GPM - Flexnet

Time run: 9/3/2013 5:04:48 PM

Calendar Date	Customer Type	Customer Name	Allocation (GPM)	Flow (GPM)	Flow Exceeded
8/27/2013	AGRICULTURAL	[REDACTED]	2,000	2,825	825
8/27/2013	AGRICULTURAL	[REDACTED]	80	246	166
8/27/2013	AGRICULTURAL	[REDACTED]	780	849	69
8/27/2013	WHOLESALE	[REDACTED]	200	261	61
8/27/2013	AGRICULTURAL	[REDACTED] NS	500	540	40
8/27/2013	LANDSCAPE	[REDACTED] FIC	79	110	31
8/27/2013	LANDSCAPE	[REDACTED]	19	49	30
8/27/2013	RECREATIONAL	[REDACTED] ATES	420	444	24
8/27/2013	AGRICULTURAL	[REDACTED]	43	65	22
8/27/2013	AGRICULTURAL	[REDACTED]	230	231	1

[Return](#) - [Analyze](#)

Customer / System Monitoring



View by: [Gallons Per Minute \(Main Page\)](#) [Acre Feet](#) [Million Gallons](#)

Year:
 Month:
 Delivery Capacity:

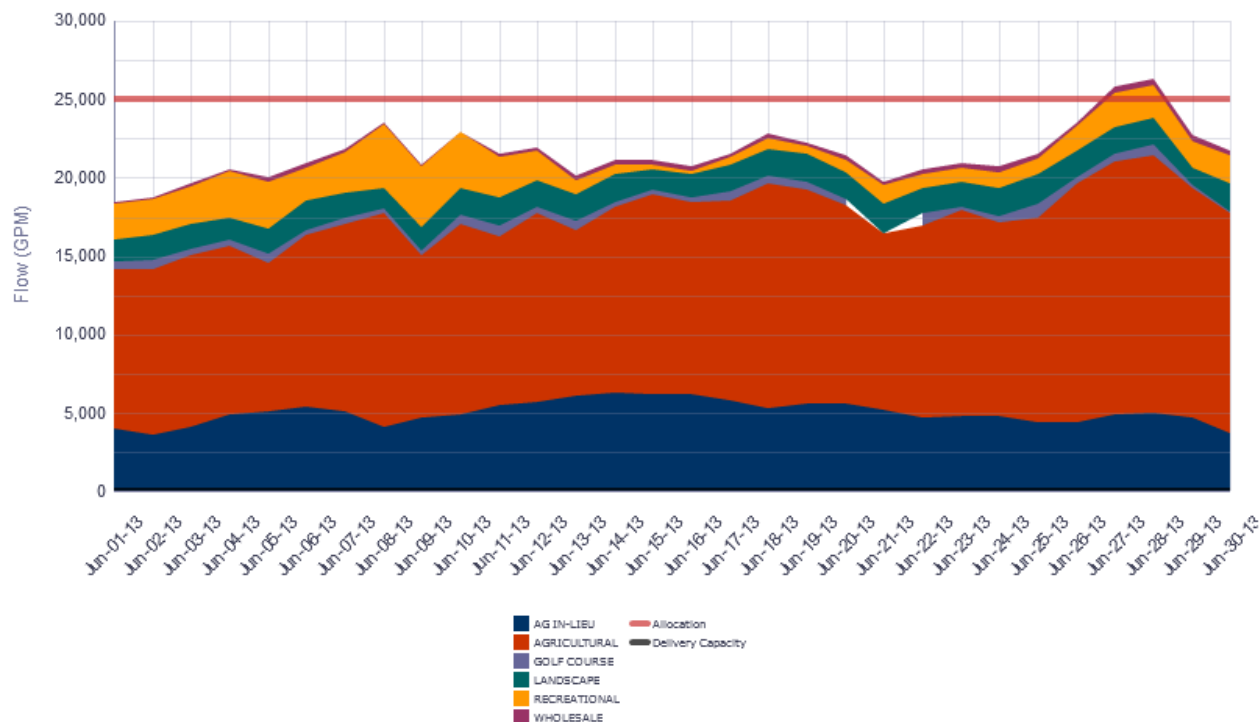
FLEXNET

Flow Analysis Using Gallons Per Minute

Displays the Cumulative Maximum Allocation in Gallons Per Minute
Time run: 9/3/2013 5:07:35 PM

Drill Level Values

☐ AG IN-LIEU
 ☐ AGRICULTURAL
 ☐ GOLF COURSE
 ☐ LANDSCAPE
 ☐ RECREATIONAL
 ☐ WHOLESALE



Calendar Date	Customer Type	Allocation (GPM)	Flow (GPM)
Jun-01-13	AG IN-LIEU	25,050	4,000
	AGRICULTURAL	25,050	10,213
	GOLF COURSE	25,050	411
	LANDSCAPE	25,050	1,441
	RECREATIONAL	25,050	2,245
	WHOLESALE	25,050	153
Jun-01-13 Total		25,050	18,463
Jun-02-13	AG IN-LIEU	25,050	3,621
	AGRICULTURAL	25,050	10,553
	GOLF COURSE	25,050	620
	LANDSCAPE	25,050	1,568
	RECREATIONAL	25,050	2,329
	WHOLESALE	25,050	70
Jun-02-13 Total		25,050	18,761
Jun-03-13	AG IN-LIEU	25,050	4,142
	AGRICULTURAL	25,050	10,898
	GOLF COURSE	25,050	461
	LANDSCAPE	25,050	1,539
	RECREATIONAL	25,050	2,378
	WHOLESALE	25,050	242
Jun-03-13 Total		25,050	19,660
Jun-04-13	AG IN-LIEU	25,050	4,893
	AGRICULTURAL	25,050	10,738
	GOLF COURSE	25,050	443
	LANDSCAPE	25,050	1,420
	RECREATIONAL	25,050	2,903
	WHOLESALE	25,050	184

Customer Performance



View By Customer Type ▼

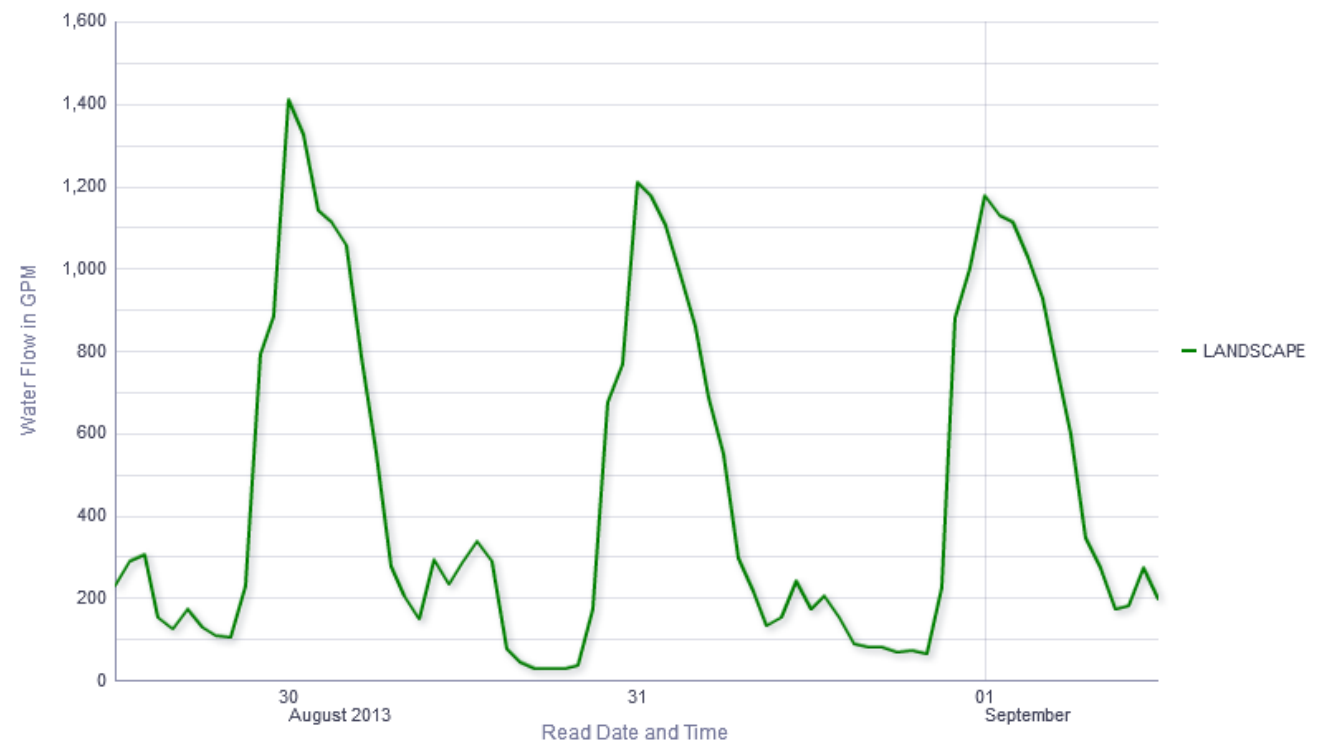
Water Window Analysis

For Customer ☒ [X]

Time run: 9/3/2013 5:02:57 PM

Read Time	Flow (GPM)
8/29/2013 12:00:00 PM	231
8/29/2013 1:00:00 PM	290
8/29/2013 2:00:00 PM	306
8/29/2013 3:00:00 PM	152
8/29/2013 4:00:00 PM	127
8/29/2013 5:00:00 PM	173
8/29/2013 6:00:00 PM	127
8/29/2013 7:00:00 PM	110
8/29/2013 8:00:00 PM	105
8/29/2013 9:00:00 PM	229
8/29/2013 10:00:00 PM	794
8/29/2013 11:00:00 PM	883
8/30/2013 12:00:00 AM	1,409
8/30/2013 1:00:00 AM	1,326
8/30/2013 2:00:00 AM	1,140
8/30/2013 3:00:00 AM	1,114
8/30/2013 4:00:00 AM	1,058
8/30/2013 5:00:00 AM	786
8/30/2013 6:00:00 AM	555
8/30/2013 7:00:00 AM	277
8/30/2013 8:00:00 AM	204
8/30/2013 9:00:00 AM	149
8/30/2013 10:00:00 AM	292
8/30/2013 11:00:00 AM	234
8/30/2013 12:00:00 PM	284

Rows 1 - 25



Results



- Increased Communication / Collaboration with Customers
- Enhanced Understanding of Level of Service Requirements
 - Accurate, granular and enterprise data is key
 - Recycled demand is “discretionary”
- Minimizes “Committed But Not Used” Supply
- 2012 – Highest Recycled Water Use Ever
 - Over 36,000 Acre Feet
- No Delivery Shortages

Challenges



- Paradigm Shift
 - Recycled Water as “Commodity”
 - Level of service impacts to customers and system and vice versa
- Balancing Supplies, Storage and Demands
 - (2014 is off to a bad start)
- Real-time Accurate Demand Data
- Real-time Accurate Supply Data

Opportunities



Short term:

- Enterprise Data Management / Analysis
 - Meter flow data
 - Geographic demand management
 - Customer coordination / support / empowerment
- Additional Analytical Support
- Optimize Management of Seasonal Storage and Associated Water Losses



Long term:

- Pursue a Balanced Demand Portfolio
 - Relative value of commodity – recover cost
 - Seasonality of demands – flatten composite curve
 - Support of long-term Strategic Objectives
- Pursue Additional “Non-potable” Supplies



Questions?

John Wuerth
951-928-3777 ext.4334
wuerthj@emwd.org

Becky Rathbone
951-928-3777 ext.6242
rathboneb@emwd.org