City of Pomona

Recycled Water Master Plan

FINAL

NOVEMBER 2009

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City of Pomona

Recycled Water Master Plan

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LIST OF ABBREVIATIONS

Abbreviation	Description
°F	degrees Fahrenheit
AAD	Average Annual Demand
ADD	Average Day Demand
AAF	Average Annual Flow
ac-ft/yr	acre-ft per year
ARRA	American Recovery and Reinvestment Act
BMP	Best Management Practice
Cal Poly	California Polytechnic University of Pomona
Carollo	Carollo Engineers
CC	Construction Cost
CCR	California Code of Regulations
CEC	Chemicals of Emerging Contaminants
CEQA	California Environmental Quality Act
CIMIS	California Irrigation Management Information System
CIP	Capital Improvement Program
City	City of Pomona
CPI	Consumer Price Index
CWC	California Water Code
CWSRF	Clean Water State Revolving Fund
DIP	Ductile Iron Pipe
DPH	Department of Public Health
DPS	Department of Public Safety
DWR	Department of Water Resources
ENR	Engineering News Record
EPS	Extended Period Simulation
ERUL	Evaluated Remaining Useful Life
ET	Evapotranspiration
FCV	Flow control valve
ft/kft	Feet per thousand feet
ft/s	Feet per second
FTE	Full time employee
gal	Gallon
GIS	Geographic Information System
GO	General Obligation
gpd/ac	Gallons per day per acre
gpm	Gallons per minute
H_2OMAP Water	Hydraulic Modeling software package from MWH Soft, Inc.
HCF	Hundred cubic feet
HGL	Hydraulic Grade Line
HOA	Home Owners Association
hp	Horsepower
I-10	Interstate 10

Abbreviation	Description
I-15	Interstate 15
IEUA	Inland Empire Utilities Agency
in	Inches
IRWM	Integrated Regional Water Management
KWh	Kilowatt-hour
LF	Linear foot
LOS	Level of service
MCC	Motor Control Center
MDD	Maximum Day Demand
MG	Million Gallon
mgd	Million gallons per day
MinDD	Minimum Day Demand
MMD	Maximum Month Demand
MOA	Memorandum of Agreement
MWDSC	Metropolitan Water District of Southern California
MWH	Montgomery Watson Harza
O&M	Operations and Maintenance
OOS	Out of service
ORUL	Original Remaining Useful Life
PHD	Peak Hour Demand
PPL	Project Priority List
PRV	Pressure Reducing Valve
PS	Pump Station
psi	Pounds per square inch
PUSD	Pomona Unified School District
PWRP	Pomona Water Reclamation Plant
R&R	Rehabilitation and Replacement
RWMP	Recycled Water Master Plan
RWQCB	Regional Water Quality Control Board
SAR	Sodium Adsorption Ratio
SCADA	Supervisory Control and Data Acquisition
SCE	Southern California Edison
SDLAC	Sanitation Districts of Los Angeles County
SR	State Route
SRF	State Revolving Fund
SWRCB	State Water Resources Control Board
USBR	U.S. Bureau of Reclamation
USGS	United States Geological Survey
VFD	Variable Frequency Drive
WDF	Water Demand Factor
WRCC	Western Regional Climate Center
WRP	Water Reclamation Plant
WVWD	Walnut Valley Water District

ES.1 INTRODUCTION

This Recycled Water Master Plan (RWMP) evaluates developments that have impacted the City's recycled water system since 2005, when the City of Pomona (City) completed the 2005 Water and Recycled Water Master Plan (MWHa, 2005). Developments such as the closing of two large paper mills have reduced the City's recycled water demand such that new customers can be served with the available supplies from the Sanitation Districts of Los Angeles County (SDLAC) Pomona Water Reclamation Plant (PWRP). Consequently, there is a need to evaluate which new customers can be added to the City's existing recycled water system in the most cost-effective manner. The purpose of this project is to determine these preferred system expansions and develop a capital improvement program (CIP) with a phased implementation approach.

ES.2 STUDY AREA

Located in Los Angeles County approximately 30 miles east of downtown Los Angeles, the City is predominantly characterized with residential, industrial, and commercial areas. The City encompasses about 23 square miles and the study area for this project is depicted on Figure ES.1. As shown, the City is bounded on the east by the City of Montclair, on the south by the cities of Chino and Chino Hills, on the southwest by the City of Diamond Bar, and on the north by the cities of La Verne and Claremont.

ES.3 RECYCLED WATER DEMANDS

The primary objective of implementing a recycled water system expansion is the reduction in potable water use, which is necessary because of the increasing cost of potable water due to the state-wide drought conditions, mandatory delivery cutbacks, and more stringent water quality regulations.

However, only a portion of the overall potable water market can be served by recycled water due water quality requirements. To determine the feasibility of an expanded recycled water system, customer locations and their associated demands were identified as part of this RWMP.

The recycled water market assessment consisted of the evaluation of historical water usage data, aerial photos, road maps, and lists of City parks. Through this process, a list of more than 100 potential recycled water customers was generated and demand estimates were prepared for each customer. The locations of these potential customers are shown on Figure ES.2, while a summary of customer demands by user category is presented in Table ES.1.

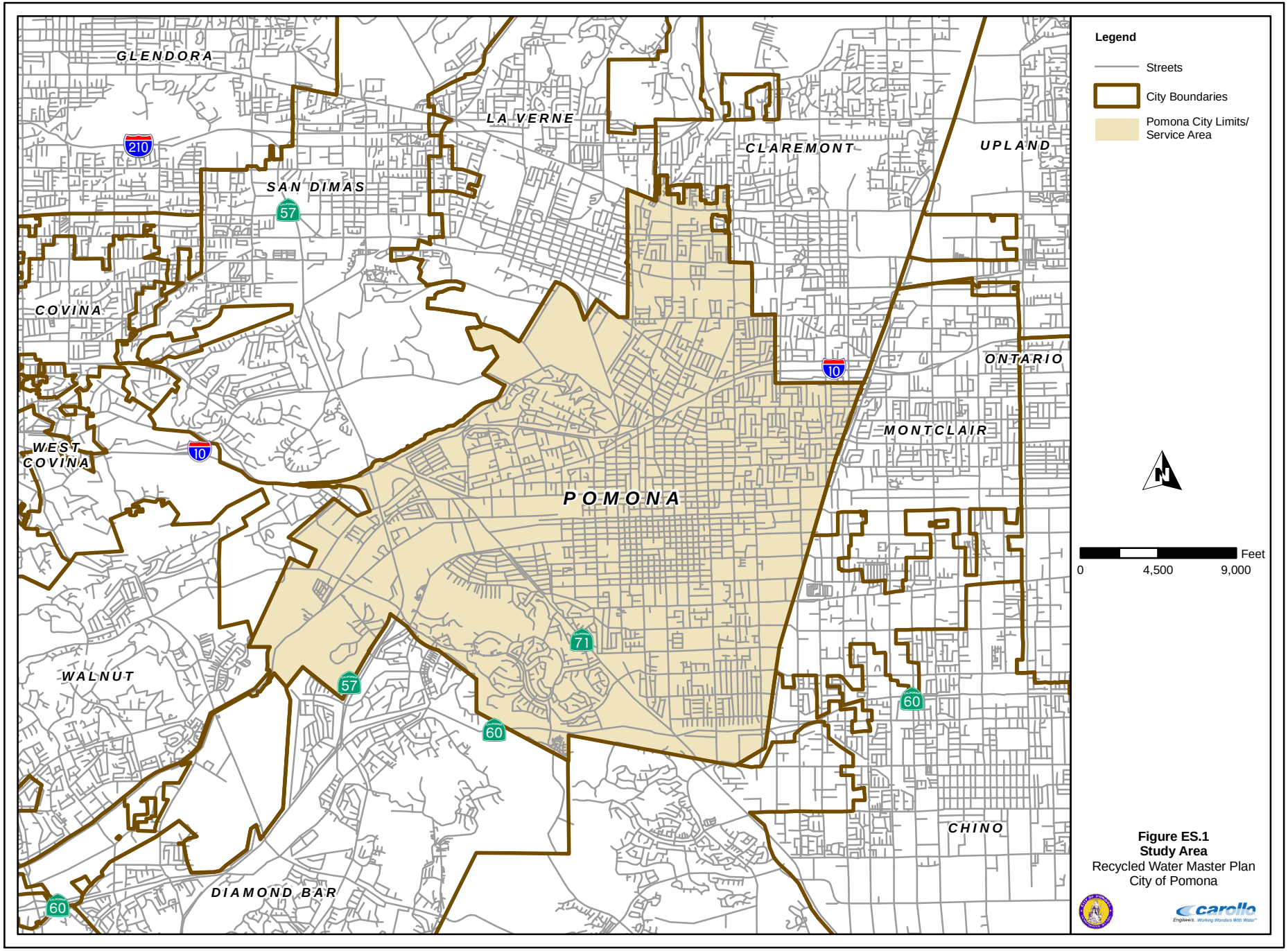
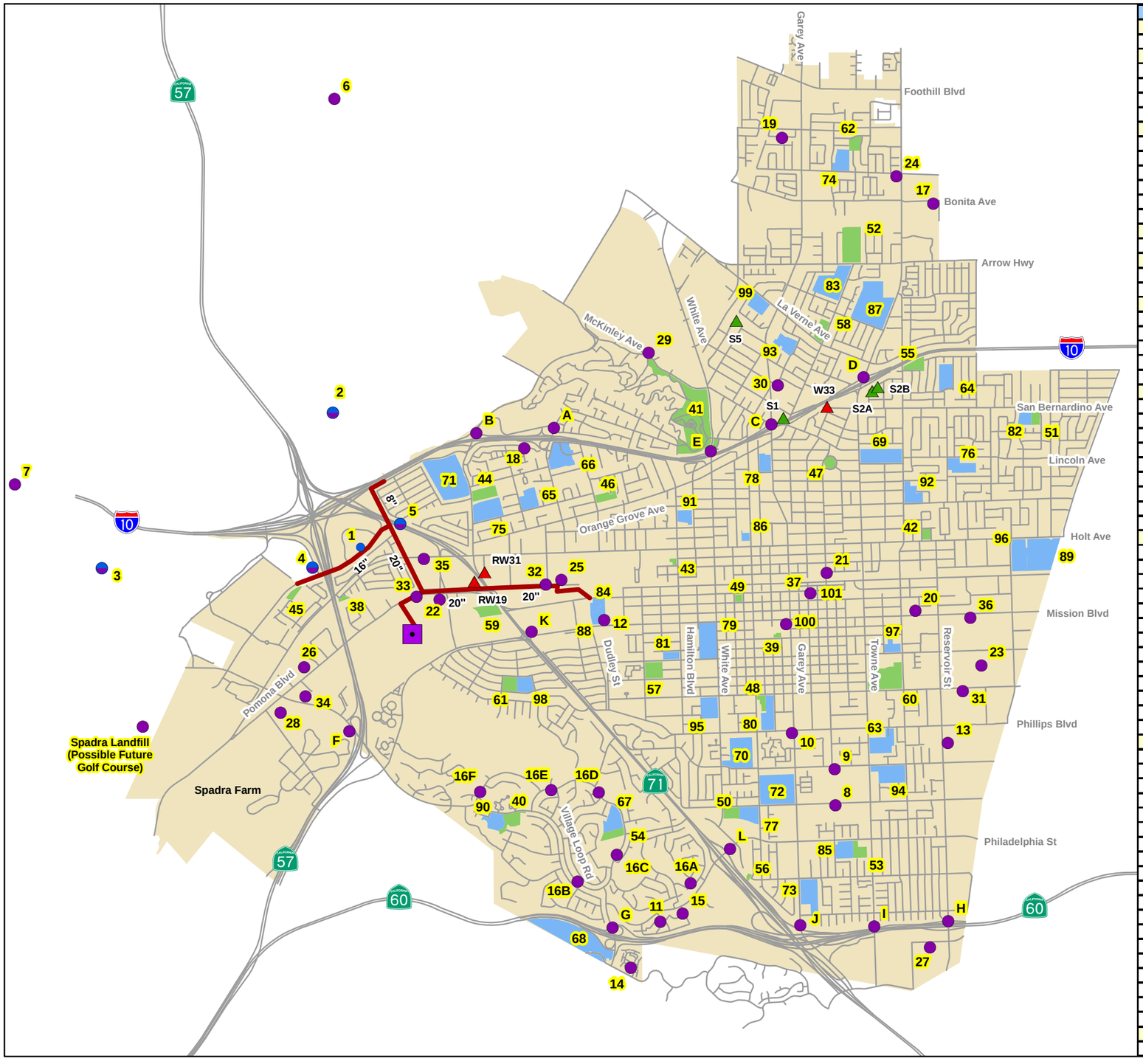


Figure ES.1
Study Area
Recycled Water Master Plan
City of Pomona



Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
B	I-10 & Fairplex	H	SR-60 & Reservoir Rd.
C	I-10 & Garey	I	SR-60 & Towne
D	I-10 & Towne	J	SR-71 & Garey
E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
Potential Customers - Cemeteries			(A - F)
7	Forest Lawn Mortuary	9	Pomona Cemetery
8	Holy Cross Cemetery		
Potential Customers - Homeowners Associations			
10	Amcal Portofino Villas	15	Phillips Meadows
11	Country Pk Villas	16	Phillips Ranch
12	Estates-Pomona Westland	17	Quail Creek Pomona
13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
20	Braun Linen Service	29	Pomona Fairplex
21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
37	Centennial Park	50	Mlk Jr Memorial Park
38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
40	Country Crossing Park	53	Philadelphia Park
41	Ganesha Park	54	Phillips Ranch Park
42	Garfield Park	55	Pomona Jaycee Park
43	Hamilton Park	56	Powers Park
44	John F. Kennedy Park	57	Ralph Welch Park
45	Kellogg Park	58	Ted Greene Park
46	Kiwanis Park	59	Veterans Park
47	Lincoln Park	60	Washington Park
48	Madison Park	61	Westmont Park
49	Memorial Park	62	Willie White Park
Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
66	Cortez Elementary	85	Philadelphia Elementary
67	Decker Elementary	86	Pomona Alternative (PAS)
68	Diamond Ranch Senior High	87	Pomona Senior High
69	Emerson Middle	88	Pomona Vocational
70	Fremont Middle	89	Pueblo Elementary
71	Ganesha Senior High	90	Ranch Hills Elementary
72	Garey Senior High	91	Roosevelt Elementary
73	Garey Village (HS)	92	San Antonio Elementary
74	Harrison Elementary	93	San Jose Elementary
75	John Marshall Middle	94	Simons Middle
76	Kingsley Elementary	95	Vejar Elementary
77	Lexington Elementary	96	Village Academy (HS)
78	Lincoln Elementary	97	Washington Elementary
79	Lopez Elementary	98	Westmont Elementary
80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Wells (City)
- Non-Potable Wells (Simpson Paper Company)
- Recyled Water Pipelines
- Streets
- City Limits/Service Area

Reycled Water Customers

- Existing Recycled Water Customers
- Existing Recycled Water Customers with Additional Supply Needs
- Potential Recycled Water Customers
- Potential Recycled Water Customers - Parks
- Potential Recycled Water Customers - Schools

0 3,000 6,000 Feet

Figure ES.2
Potential Recycled Water Customers
Recycled Water Master Plan
City of Pomona

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Table ES.1 Customer Demand by Category
Recycled Water Master Plan
City of Pomona

Customer Category[1]	Existing System ADD (ac-ft/yr)	Potential Future ADD [3] (ac-ft/yr)
Existing Customers	2,189[2]	2,834
Caltrans irrigation areas	0	137
Neighboring Cities	0	428
Cemeteries	0	455
Home Owner Associations	0	281
Industrial/Commercial Users	0	741
Parks	0	587
Schools	0	687
Specific Plan Areas	0	0
Total	**2,189**	**6,150**

Notes:

(1) Details by category are presented in Appendix D.

(2) Average Existing Demand in year 2008.

(3) Potential Demand in year 2030.

The average day demand (ADD) of existing customers is approximately 2.0 mgd or 2,189 ac-ft/yr, while the maximum month demand (MMD) is estimated to be 4.2 mgd (1.95 x 2.15 MMD peaking factor). The projected future ADD with all potential customers is estimated at 5.5 mgd or 6,150 ac-ft/yr, while the future MMD is about 11.6 mgd (using the weighted MMD factor of 2.1). The peaking factors and the respective diurnal demand patterns are presented in more detail in Chapter 3.

ES.4 RECYCLED WATER SUPPLY

Currently, the main supply for the City's recycled water system is the PWRP, which delivers tertiary treated wastewater collected and treated by the SDLAC. However, the City also has three non-potable wells (Wells 19, 31, and 33) and four non-potable wells of the former Simpson Paper Company. Wells 19 and 31 are located in the southwest area of the City and are already connected to the existing recycled water system. These existing recycled water supply sources are shown on Figure ES.3.

As of 2001, the City of Pomona has rights to receive two-thirds of the effluent flow from the PWRP. Although the plant has an average annual flow (AAF) capacity of 15 mgd, typical plant flows vary between about 4 and 15 mgd during a typical 24-hour period, resulting in an average daily flow of about 9.0 mgd. Consequently, the average recycled water supply that the City receives is about 6.0 mgd.

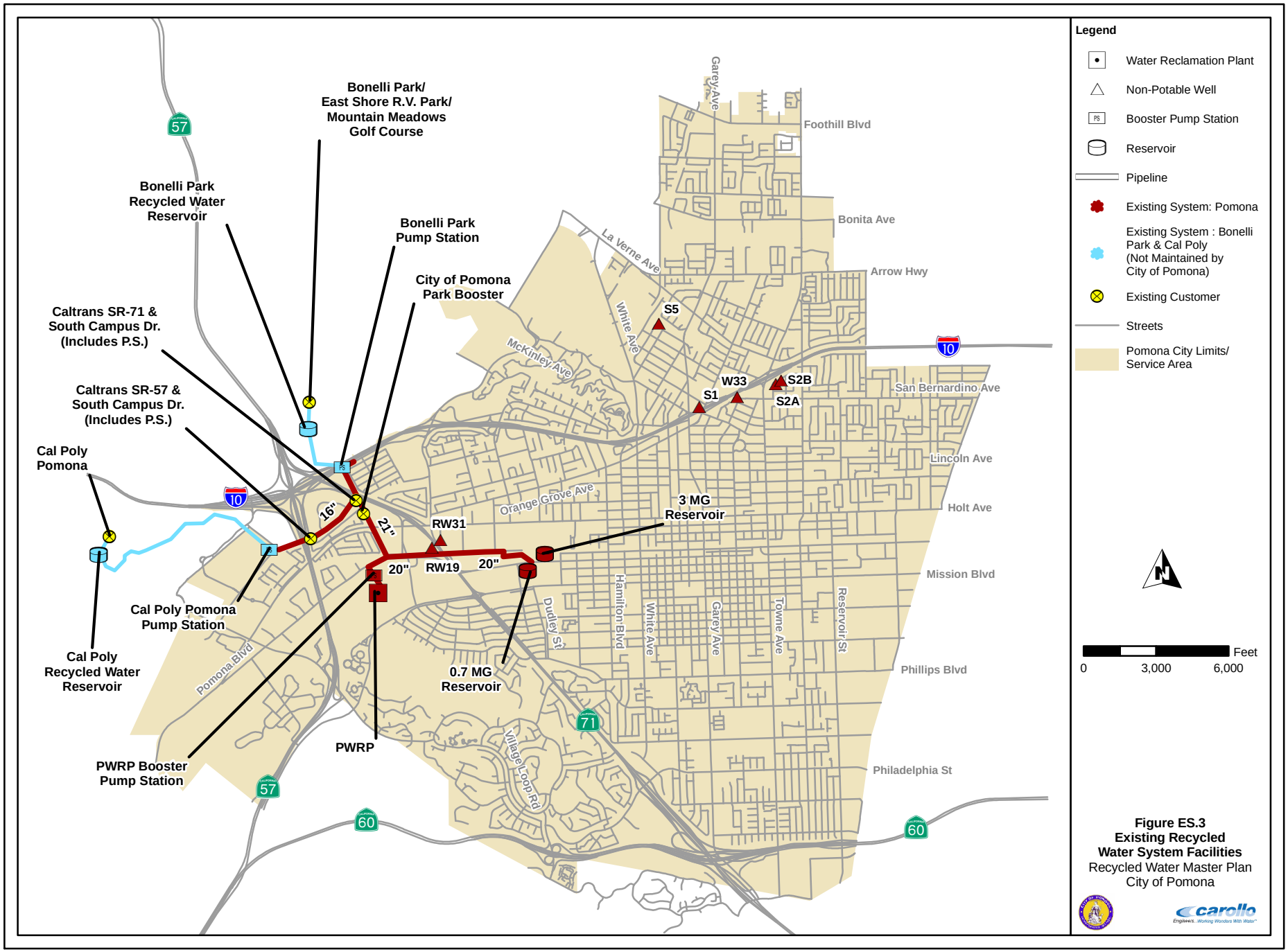


Figure ES.3
Existing Recycled
Water System Facilities
Recycled Water Master Plan
City of Pomona

The combined capacity of the two connected non-potable wells (Wells 19 and 31) is about 1.0 mgd. Well 33 is located in the northeast area of the City and is thereby a considerable distance from the existing recycled water distribution system. The capacity of Well 33 is approximately 0.2 mgd.

The City also owns four non-potable wells of the Simpson Paper Company, which have a combined capacity of about 2.3 mgd. These abandoned wells could be developed, but are in need of significant repair. The water quality of the wells is also questionable since measurements have not been taken in years. Due to these uncertainties, these four Simpson wells were not considered as a potential future supply source.

The existing supplies are sufficient to meet the City's potential ADD (5.5 mgd), including the demands of Cal Poly Pomona and Forest Lawn Cemetery, which are two large customers that are located outside the City boundary. However, the projected peak summer demands (11.6 mgd) would exceed the current recycled water supplies. The City could address this supply shortfall with the following six approaches:

1. Supplement the supply shortfall during the summer months with potable water.
2. Prioritize the potential customers and only expand the system such that the future MMD does not exceed the available supplies.
3. Work with the SDLAC to look for opportunities to increase the supply from the PWRP.
4. Rehabilitate existing non-potable wells that are currently out of service.
5. Look for new supply sources, such as the Inland Empire Utilities Agency (IEUA).
6. Use a combination of the options above.

If the existing and future supplies are totaled, the City's recycled water supply could potentially increase from 7.0 mgd to 12.4 mgd. However, a number of the potential sources are unlikely to occur within the planning horizon of this master plan (year 2030) and have various issues that must be addressed to actually increase the City's recycled water supply capacity. The breakdown of the capacities and description of the related issues are summarized in Table ES.2. A detailed description of these various supply strategies is included in Chapter 4.

Table ES.2 Recycled Water Supply Sources City of Pomona
Recycled Water Master Plan
City of Pomona

Supply Source	Existing Source?	Location	Issues	Supply (mgd)
Pomona WRP	Yes	295 S. Humane Way	• Flow varies based on Plant operations.	6.0(1)
Well 19(4)	Yes	131 N. Bellevue Ave.	• Water quality unknown(2)	0.8
Well 31(4)	Yes	302 Short St.	• Water quality unknown(2	0.2
Existing Supply Capacity				**7.0**
Well 33(3)	Yes	San Bernardino Ave. and Gibbs St.	• Well needs to be connected; • Water quality unknown(2)	0.2
Simpson Wells(4)	No	Various locations in northeastern part of the City (see Fig. 2.1)	• Significant repairs needed; Potential water quality issues; • Requires pipelines to connect to the City's RW system.	2.3
Existing Supply Capacity plus City Wells				**9.5**
IEUA	No	Lincoln Ave.	• Requires agreement with IEUA; • Requires a 2-mile pipe to City boundary	1.3(3)
Pomona WRP Expansion	No	295 S. Humane Way	• Dependent upon SDLAC expansion plans	1.6(4)
Potential Supply Capacity with all Sources				**12.4**

Notes:

(1) Assumes that future influent flows will be greater, thereby allowing the plant to slightly increase the amount of sewage that is treated on a daily basis. Currently the average portion allocated to the City is two-thirds of 8.4 mgd (5.6 mgd).

(2) Well water quality data has not be taken in several years.

(3) Based on a flat delivery from IEUA of 1,500 ac-ft/yr or 1.3 mgd. However, IEUA has informed the City that it will not provide recycled water within the planning horizon of RWMP (Pomona, 2009c)

(4) Based on 2.5 mgd capacity increase due to installation of equalization basins and a 2/3 allocation for the City.

ES.5 RECYCLED WATER MODEL

A recycled water hydraulic model was developed as part of this RWMP to size the future recycled water system pipelines and facilities. This model was created using $H_2ONET^{®}$ Version 8.0 as hydraulic modeling software platform. Details on the model development and the evaluation and sizing criteria are described in Chapters 5 and 6, respectively.

The locations of the potential recycled water customers guided the layout of the proposed recycled water system. The system was divided into five pressure zones based on the pressure criteria, the customer locations, and the City's topography.

Once the pressure zones were established, the location of reservoirs, booster stations, pressure reducing stations, and the most optimum pipeline alignments were identified. The pipelines were aligned such that the distribution network reaches the potential recycled water customers with the shortest pipeline routes.

ES.6 EXISTING RECYCLED WATER SYSTEM ANALYSIS

An analysis of the existing system was conducted to identify issues that must be resolved for continued system operation and accommodate future system expansions. This analysis consisted of the following three components:

- Condition assessment;
- Hydraulic analysis; and
- System operations evaluation.

Based on this analysis the following recommendations were made:

- The City currently has a maintenance program for its recycled water system. The results of the condition assessment should act as an additional reference for assessing maintenance needs in the City's maintenance program. The assessment reaffirmed the City's high maintenance priority for certain pumps at the recycled water pump station at the PWRP site and Well 19. Continued maintenance under the City's current program including repair and rehabilitation (R&R) projects based on the assessment will assist with the continued operation of the system, during both existing conditions and under increased stresses from future system expansion.
- Pipelines provide adequate conveyance capacity for existing demands; however, the City would possibly need to upgrade the 16-inch and 21-inch diameter pipelines north of the PWRP if either Cal Poly or Bonelli Park upgrades their pump station to a higher capacity to meet the projected future demands. For this reason, the City should actively monitor and possibly participate in the plans that either entity may have or develop for enlarging their pump stations.

- The City should continue to maintain the current system pressures in the existing system even through these pressures are below the values stated in the evaluation criteria. The current pressure values are adequate for continued operation of the existing system. For a future system, pump stations will be required to pressurize expansions branching from the existing system.
- The City should install variable frequency drives (VFDs) at the existing recycled water pump station (PS) at the PWRP. These VFDs will allow the City to fully utilize the effluent flow from the Plant, while avoiding unnecessary discharges to San Jose Creek during peak demand periods.
- The City may want to consider creating a SCADA function that calculates the difference in reservoir level over time and in 24-hour intervals. The SCADA system can use this information to calculate the amount of potable make-up water required to balance the reservoirs and to control an automated potable water make-up addition.
- The City should install backup power for its recycled water facilities in addition to the current ability to use potable make-up water during a power failure.
- The City should install a portable generator connection with a manual transfer switch when the City replaces the breaker and switchboard at the recycled water PS.

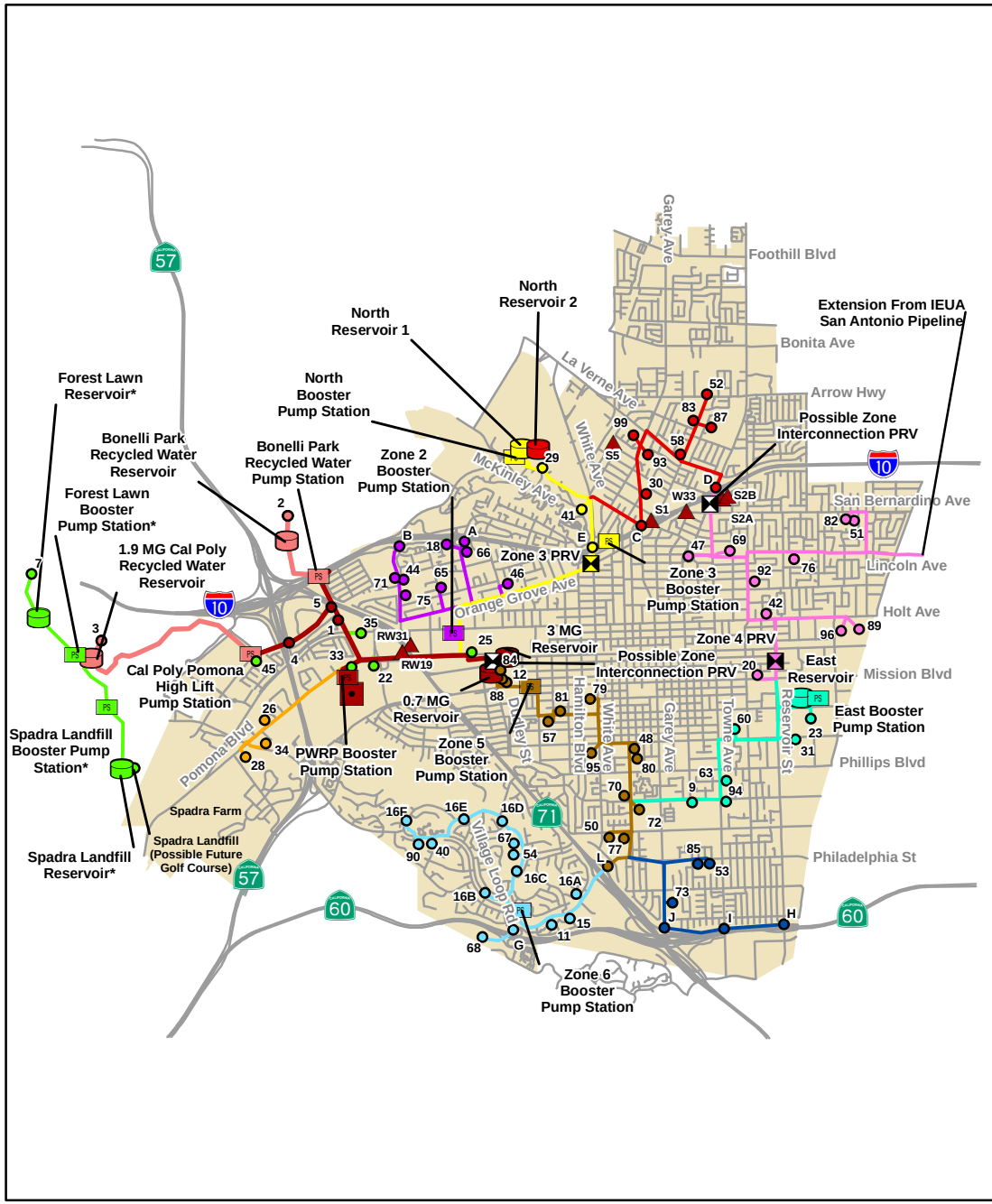
More details on the existing system analysis can be found in Chapter 7.

ES.7 FUTURE RECYCLED WATER SYSTEM ANALYSIS

The future system evaluation used the hydraulic model to develop potential system expansion alternatives that met the evaluation criteria defined in Chapter 5 of this RWMP. The methodology used for the creation alternatives and the selection of a recommended system for implementing recycled water system consisted of the following steps:

- Development of the initial system layout.
- Division of the initial layout into segments.
- Definition of segment requirements.
- Grouping of segments into alternatives.
- Selection of recommended system.

The initial system layout provided the best solution for serving the entire City; however, the total cost of a system serving all potential customers was relatively high. To make expansion of the recycled water system more cost-effective, the initial system layout was divided into ten separate segments, which are shown on Figure ES.4 and summarized in Table ES.3. Figure ES.4 also displays the proposed water system facilities, such as pump stations, reservoirs, and pressure reducing stations.



Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
B	I-10 & Fairplex	H	SR-60 & Reservoir Rd.
C	I-10 & Garey	I	SR-60 & Towne
D	I-10 & Towne	J	SR-71 & Garey
E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
Potential Customers - Cemeteries			
7	Forest Lawn Mortuary	9	Pomona Cemetery
8	Holy Cross Cemetery		
Potential Customers - Homeowners Associations			
10	Amcal Portofino Villas	15	Phillips Meadows
11	Country Pk Villas	16	Phillips Ranch (A - F)
12	Estates-Pomona Westland	17	Quail Creek Pomona
13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
20	Braun Linen Service	29	Pomona Fairplex
21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
37	Centennial Park	50	Mlk Jr Memorial Park
38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
40	Country Crossing Park	53	Philadelphia Park
41	Ganesha Park	54	Phillips Ranch Park
42	Garfield Park	55	Pomona Jaycee Park
43	Hamilton Park	56	Powers Park
44	John F. Kennedy Park	57	Ralph Welch Park
45	Kellogg Park	58	Ted Greene Park
46	Kiwanis Park	59	Veterans Park
47	Lincoln Park	60	Washington Park
48	Madison Park	61	Westmont Park
49	Memorial Park	62	Willie White Park
Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
66	Cortez Elementary	85	Philadelphia Elementary
67	Decker Elementary	86	Pomona Alternative (PAS)
68	Diamond Ranch Senior High	87	Pomona Senior High
69	Emerson Middle	88	Pomona Vocational
70	Fremont Middle	89	Pueblo Elementary
71	Ganesha Senior High	90	Ranch Hills Elementary
72	Garey Senior High	91	Roosevelt Elementary
73	Garey Village (HS)	92	San Antonio Elementary
74	Harrison Elementary	93	San Jose Elementary
75	John Marshall Middle	94	Simons Middle
76	Kingsley Elementary	95	Vejar Elementary
77	Lexington Elementary	96	Village Academy (HS)
78	Lincoln Elementary	97	Washington Elementary
79	Lopez Elementary	98	Westmont Elementary
80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Well
- Booster Pump Station
- Reservoir
- PRV
- Existing or Potential Recycled Water Customer
- Pipeline
- Existing System: Pomona
- Existing System : Bonelli Park & Cal Poly (Not Maintained by City of Pomona)
- Segment 1*
- Segment 2
- Segment 3
- Segment 4A
- Segment 4B
- Segment 5
- Segment 6
- Segment 7
- Segment 8
- Segment 9
- Streets
- City Limits/Service Area

Feet
0 4,500 9,000

Figure ES.4
System Expansion Segments
Recycled Water Master Plan
City of Pomona

Note: *Potential Bonelli Park & Cal Poly System Expansions are not maintained or financed by the City of Pomona.

Table ES.3 Segment Summary
Recycled Water Master Plan
City of Pomona

Segment	Description	Required Facilities	Potential MMD	Segment Cost/ac-ft
1	This segment includes connecting customers adjacent to the existing system and making modifications to existing customer systems, so that they may use more recycled water.	2 Pump Stations 2 Reservoirs	1.61 mgd [(1)] - 0.19 mgd [(2)]	$763 [(1)] - $368 [(2)]
2	This segment extends the existing system south to anchor customer Lanterman Hospital.	None	0.19 mgd	$2,655[(3)(4)]
3	This segment extends the existing system to Ganesha Park and the Fairplex, which act as anchor customers.	2 Pump Stations 1 Reservoir	0.52 mgd	$3,060
4A	Segment 4A is an expansion of the existing system to the area immediately north of the existing system.	1 Pump Station	0.23 mgd	$2,144
4B	Segment 4B extends the existing system from Segment 3 in order to supply customers between Ganesha Park and Pomona Senior High.	2 Additional Pumps 1 Reservoir	0.44 mgd	$2,409
5	Using the IEUA as a supply source, this segment extends recycled water service to the east side of the City. Braun Linens acts as an anchor customer for the segment.	None	0.66 mgd	$2,773
6	This segment maximizes use of the IEUA supply by extending the initial east side extension to a Garey Senior High School.	1 Pump Station 1Reservoir	0.42 mgd	$2,449
7	Segment 7 extends the existing system from the existing reservoirs in order to supply customers between the existing system and Phillips Ranch.	1 Pump Station	0.40 mgd	$3,564
8	If additional IEUA supply is available, this segment extends service from Segment 6 to additional customers adjacent to Route 60.	1 Additional Pump	0.21 mgd	$3,253
9	This segment extends service from Segment 7 to the additional customers in the Phillips Ranch area.	1 Additional Pump 1 Pump Station	0.80 mgd	$1,804

Notes:
(1) Includes new customers and expanded use at Cal Poly and Forest Lawn.
(2) Excludes the cost associated with infrastructure that will be owned and operated by others.
(3) Due current state budget constraints, it is unlikely that the hospital will have the funding to connect to a potential recycled water main. Consequently, the hospital is not included in the calculation for this number. If included, the unit cost would be significantly lower.
(4) Cost would increase to $4,903/ac-ft if a new 12-inch main is installed in lieu of rehabilitating the existing 12-inch main.

Considering the recycled water supply constraints and cost considerations, two alternatives were developed for the expansion of the City's recycled water system. The alternatives are as follows:

- **Alternative 1**. This alternative expands the recycled water system to the south and east and includes Segments 1, 2, 7, 9, and 8.
- **Alternative 2.** This alternative expands the recycled water system to the north and east and includes Segments 1, 2, 3, 4A, and 4B.

These two alternatives were further evaluated and discussed with City staff to define the recommended system for this CIP. Based on these discussions, Alternative 1 was selected as the basis of the recommended system. Alternative 1 is more cost effective on a per acre-foot basis and focuses on segments considered most viable by the City. Consequently, the recommended system includes the most cost effective ($/ac-ft) segments from Alternative 1 that can be supplied with the existing supply capacity from the PWRP.

The recommended system consists of Segments 1, 7, and 9 from Alternative 1. These segments were chosen based on the projected supply capacity discussed in Chapter 4 and the overall cost-effectiveness of the combination of segments. The demands, supplies, and unit cost per segment are presented on Figure ES.5. The projects required for the recommended system are all included in the CIP of this master plan, which has a planning horizon of year 2030.

The ultimate system includes all remaining segments that are not part of the recommended system. These omitted portions included in the ultimate system are Segments 2, 3, 4A, 4B, 5, 6, and 8. The demands, supplies, and unit cost per segment of the ultimate system are also presented on Figure ES.5. For planning purposes, it is assumed that the ultimate system would be developed by year 2050.

As shown on Figure ES.5, the ultimate system would require additional recycled water supplies from either increased deliveries by SDLAC at the PWRP and/or the IEUA through a connection with the San Antonio Pipeline on the eastern part of the City. The SDLAC would need to install equalization basins to increase the plant capacity, which is not scheduled at this time. Per the current statements from IEUA, there is no commitment to deliver recycled water to the City (see Appendix E).

If additional supplies are secured in the future, the City's recycled water system could be expanded further to include all segments shown in Figure ES.4. Although the system expansions of the ultimate system are not cost-effective at this time, the anticipated increase in potable water cost over the next two decades will likely change the threshold when recycled water is cost-effective.

ES.8 CAPITAL IMPROVEMENT PROGRAM

The CIP for this report is based on the cost estimates for the recommended and ultimate systems that are summarized in Table ES.4.

Table ES.4 Recommended System Cost
Recycled Water Master Plan
City of Pomona

Recommended System[1]	Capital Cost ($millions)	Additional Supply Needed	Annual Demand (ac-ft/yr)	Unit Cost ($/ac-ft)
Segment 1[3]	$0.3	No	868	$368
Segment 7	$10.0	No	210	$3,444
Segment 9	$10.4	No[4]	419	$1,804
Subtotal	**$20.7**		**1,497**	**$2,171**
Ultimate System[2]				
Segment 2	$1.3	Yes	107	$2,655
Segment 3	$11.9	Yes	282	$3,060
Segment 4A	$4.0	Yes	135	$2,144
Segment 4B	$7.6	Yes	231	$2,409
Segment 5	$16.1	Yes	423	$2,773
Segment 6	$7.9	Yes	235	$2,449
Segment 8	$3.2	Yes	71	$3,253
Subtotal	**$52.0**		**1,484**	**$2,677**
GRAND TOTAL	**$72.7**		**2,981**	**$2,510**

Notes:

(1) Proposed System for Year 2030 as shown on Figure 9.2.

(2) Proposed System for Year 2050 as shown on Figure 9.3.

(3) The cost for Segment 1 presented in this table only includes those capital costs that are associated with the City's owned infrastructure. Segment 1 includes infrastructure improvements for facilities that would be owned and operated by Forest Lawn Mortuary and Cal Poly Pomona, which associated costs are excluded in the cost estimate. The unit cost is therefore lower than presented in Chapter 8.

(4) No additional supplies available as long as Cal Poly does not develop the Spadra Farm.

2030

Recommended System without Additional Supplies (Cost Weighted Average is $2,171/ac-ft.)

Existing System
Supply:
- PWRP: 6 mgd
- Non Potable Wells: 1 mgd
- Total: 7 mgd

Demand, MMD: 4.6[1] mgd

2.4 mgd Surplus

Segment 1
Supply: 2.4 mgd
Demand, MMD: 1.61 mgd
Cost: $368/ac-ft

0.79 mgd Surplus

Segment 7
Supply: 0.79 mgd
Demand, MMD: 0.40 mgd
Cost: $3,444/ac-ft

0.39 mgd Surplus

INSTALL VFDS AT PWRP PS

Segment 9
Supply: 0.39 mgd (0.99 mgd)[2]
Demand, MMD: 0.80 mgd
Cost: $1,804/ac-ft

Recommended System with Additional Supplies from PWRP or IEUA (Cost Weighted Average is $2,510/ac-ft.)

Existing System
Supply:
- PWRP: 6 mgd
- Non Potable Wells: 1 mgd
- Total: 7 mgd

Demand, MMD: 4.6[1] mgd

2.4 mgd Surplus

Segment 1, 7 and 9
Supply: 2.4 mgd (3.0 mgd)[2]
Demand, MMD: 2.81 mgd
Cost: $2,171/ac-ft

0 mgd Surplus

ADDITIONAL SUPPLIES

Segment 5 and 6
Supply: TBD
Demand, MMD: 1.08 mgd
Cost: $2,657/ac-ft

Segment 4A
Supply: TBD
Demand, MMD: 0.23 mgd
Cost: $2,144/ac-ft

Segment 3
Supply: TBD
Demand, MMD: 0.54 mgd
Cost: $3,060/ac-ft

Segment 4B
Supply: TBD
Demand, MMD: 0.44 mgd
Cost: $2,409/ac-ft

Segment 8
Supply: TBD
Demand, MMD: 0.14 mgd
Cost: $3,253/ac-ft

Segment 2
Supply: TBD
Demand, MMD: 0.19 mgd
Cost: $2,655/ac-ft

Notes:
(1) Includes future demand increases for existing customers
(2) Supply could be greater by about 0.60 mgd if Cal Poly foregoes irrigation/golf course construction on Spadra Landfill

START 2009

2030

2050

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carollo
Engineers...Working Wonders With Water™

RECOMMENDED AND ULTIMATE SYSTEMS FLOW CHART

FIGURE ES.5

CITY OF POMONA

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Based on the capital costs for each segment, expansion segments were grouped into project phases. In general, the initial phases are most cost effective. Costlier segments were phased later to allow the City to pursue additional outside funding that could make these phases more cost effective and affordable in the future. In addition, segments using existing supplies from the PWRP were given priority over segments requiring additional recycled water supplies as all future supplies are uncertain at the time of the preparation of this report.

Phases I through IV include all segments that are part of the recommended system and are included within the planning horizon of 2030. Ultimate system Phases V and VI include segments for possible future implementation should the City be able to obtain additional recycled water supplies. The layouts of the recommended and ultimate systems are shown on Figure ES.6. The estimated demands and costs are summarized in Table ES.5 and the cost by phase is graphically depicted on Figure ES.7.

Table ES.5 Proposed Phasing
Recycled Water Master Plan
City of Pomona

Phases	Phasing Period	Segments	Capital Cost ($millions)	New Demand[(2)] (ac-ft/yr)	Unit Cost[(3)] ($/act-ft)
Recommended System					
Phase I	2010-2015	1 and 7[(1)]	$2.0	876	$2,055[(4)]
Phase II	2015-2020	7[(1)]	$5.0	74	$4,909
Phase III	2020-2025	7[(1)] and 9[(1)]	$6.8	172	$2,859
Phase IV	2025-2030	9[(1)]	$6.9	375	$1,337
Subtotal			***$20.7***	***1,497***	***$2,171***
Ultimate System					
Phase V	2030-2040	5 and 6	$24.0	658	$2,654
Phase VI	2040-2050	2, 3, 4a, 4b, and 8	$28.0	826	$2,696
Subtotal			***$52.0***	***1,484***	***$2,677***
GRAND TOTAL			**$72.7**	**2,981**	**$2,510**

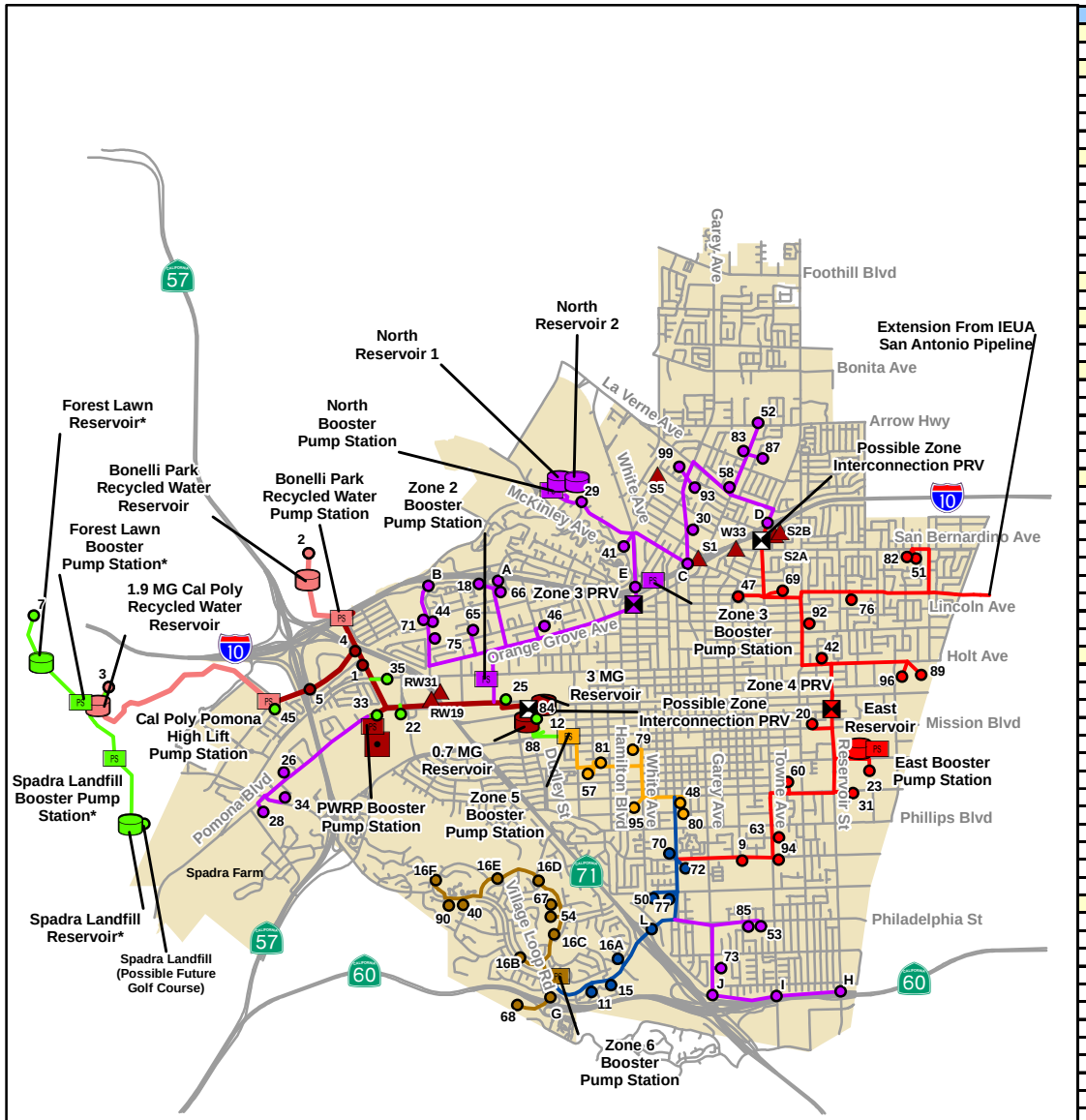
Notes:

(1) Partially included in this Phase

(2) Based on Average Annual Demand

(3) Unit costs are based on a 30-year payment period and 6-percent interest.

(4) The $/AF represents the unit cost incurred by the City only. The cost for improvement projects that would be owned and operated by Cal Poly and Forest Lawn are not included in this value.



Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
B	I-10 & Fairplex	H	SR-60 & Reservoir Rd.
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D	I-10 & Towne	J	SR-71 & Garey
E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
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Potential Customers - Homeowners Associations			
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13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
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21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
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38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
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45	Kellogg Park	58	Ted Greene Park
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47	Lincoln Park	60	Washington Park
48	Madison Park	61	Westmont Park
49	Memorial Park	62	Willie White Park
Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
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73	Garey Village (HS)	92	San Antonio Elementary
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77	Lexington Elementary	96	Village Academy (HS)
78	Lincoln Elementary	97	Washington Elementary
79	Lopez Elementary	98	Westmont Elementary
80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Well
- Booster Pump Station
- Reservoir
- PRV
- Existing or Potential Recycled Water Customer
- Pipeline
- Existing System: Pomona
- Existing System : Bonelli Park & Cal Poly (Not Maintained by City of Pomona)
- Phase I (Segments 1, 7^{P*})
- Phase II (Segment 7^{P*})
- Phase III (Segments 7^{P*}, 9^{P*})
- Phase IV (Segment 9^{P*})
- Phase V (Segments 5, 6)
- Phase VI (Segments 2, 3, 4A, 4B, 8)
- P* Partially Developed In This Phase
- Streets
- City Limits/Service Area

Feet
0 4,500 9,000

Figure ES.6
Phasing of Ultimate System
Recycled Water Master Plan
City of Pomona

Note: *Potential Bonelli Park & Cal Poly System Expansions are not maintained or financed by the City of Pomona.

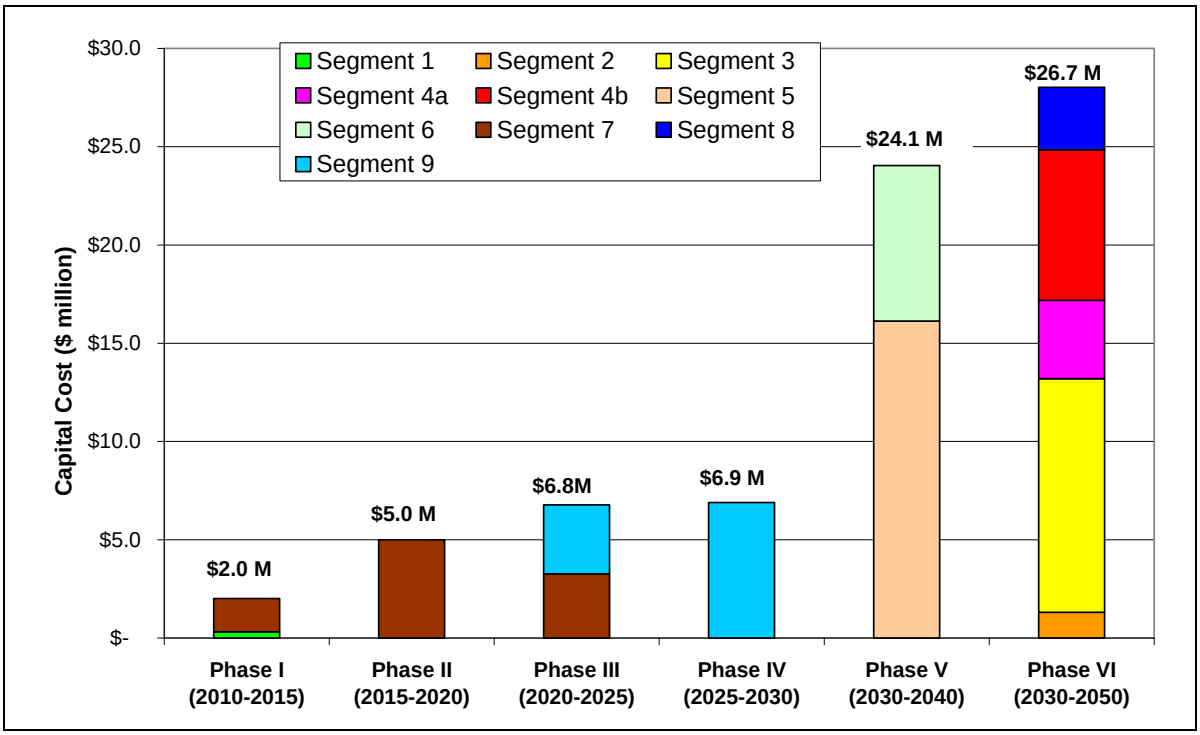

Figure ES.7 Phasing of Capital Cost by Phase

As shown in Table ES.5, the projected demand increase of the Recommended System is about 1,497 ac-ft/yr, with an average unit cost of $2,171 per acre-foot. This is approximately the twice the anticipated unit cost of imported potable water in 2010/2011. Hence, it can be concluded that the recommended system will require funding to be a cost-effective system that increases recycled water usage and decreases the City's reliance on imported water supplies. The average unit cost of the Ultimate System is higher at $2,677 per acre-foot. However, these system expansions are not anticipated before 2030, when potable water cost will most likely have increased substantially beyond $1,000 per acre-foot. As mentioned, the capital cost presented in this table do not account for any outside funding, which can substantially decrease the City's portion of capital investments.

ES.9 FINANCIAL ANALYSIS AND FUNDING

A cash flow analysis was conducted on the proposed phasing to determine its feasibility of the implementation of this CIP. Based on the financial analyses that are described in detail in Chapter 9 of this RWMP, the City could potentially pursue $30M in funding from Bureau of Reclamation Title XVI Program ($20M), the State Water Recycling Fund Program ($5M), and the MWDSC Local Resources Program ($5M).

This $30M amount is the maximum amount of outside funding the City could pursue at this time, although other funding sources could become available as the state economic budget crisis subsides. More detailed information on the financial analysis and available funding sources in included in Chapter 9.

Based on the financial analysis presented in Chapter 9, it was concluded that it is feasible to implement the Recommended System. Even if funding is not secured, the worst-case scenario shows that the costs from debt service and O&M allow for the production of recycled water at a rate that is significantly cheaper than the MWDSC Tier 2 rate. In addition, the net revenue for these phases should exceed net operating costs that include O&M and debt service.

With the increasing scarcity and cost of potable water in Southern California, it is recommended that the City start implementing the phases of the Recommended System. An expanded recycled water system will increase the overall supply reliability, decrease the City's dependence on imported water supplies, and create a positive cash flow due to the escalating cost of imported water supplies.

1.1 INTRODUCTION

Many Southern California communities must contend with a multitude of challenges when providing a reliable water supply. The current drought, legal and environmental constraints, climate change, and population growth all have the aggregate effect of reducing the reliability of most water supplies. Recycled water provides a reliable, drought-proof supply, and the City of Pomona (City) has been providing recycled water to selected customers since 1966. The City has undertaken this Recycled Water Master Plan (RWMP) to guide the continued development of its recycled water system.

This chapter includes descriptions of the project background, study area, and project objectives. In addition, acknowledgments and an overview of the report organization are included. A list of reference documents used for the preparation of this RWMP is included in Appendix A of this report, while a list of abbreviations and acronyms is included after the Table of Contents.

1.2 PROJECT BACKGROUND

This RWMP evaluates developments that have impacted the City's recycled water system since the 2005 Water and Recycled Water Master Plan (MWH, 2005). Developments such as the closing of two large paper mills have reduced the City's recycled water demand such that new customers can be served with the available supplies from the Sanitation Districts of Los Angeles County (SDLAC) Pomona Water Reclamation Plant (PWRP). Consequently, there is a need to evaluate which new customers and additional infrastructure may be added to the City's existing recycled water system in the most cost-effective manner. The purpose of this master plan document is to determine these preferred system expansions and develop a capital improvement program (CIP) with a phased implementation approach.

Several reports and studies were reviewed to provide general background information for development of this RWMP. A list of reference documents used for the preparation of this RWMP is included in Appendix A of this report.

1.3 STUDY AREA

Located in Los Angeles County approximately 30 miles east of downtown Los Angeles, the City is predominantly characterized with residential, industrial, and commercial areas. The City encompasses about 23 square miles and is depicted on Figure 1.1. As shown, the City is bounded on the east by the City of Montclair, on the south by the cities of Chino and Chino Hills, on the southwest by the City of Diamond Bar, and on the north by the cities of La Verne and Claremont.

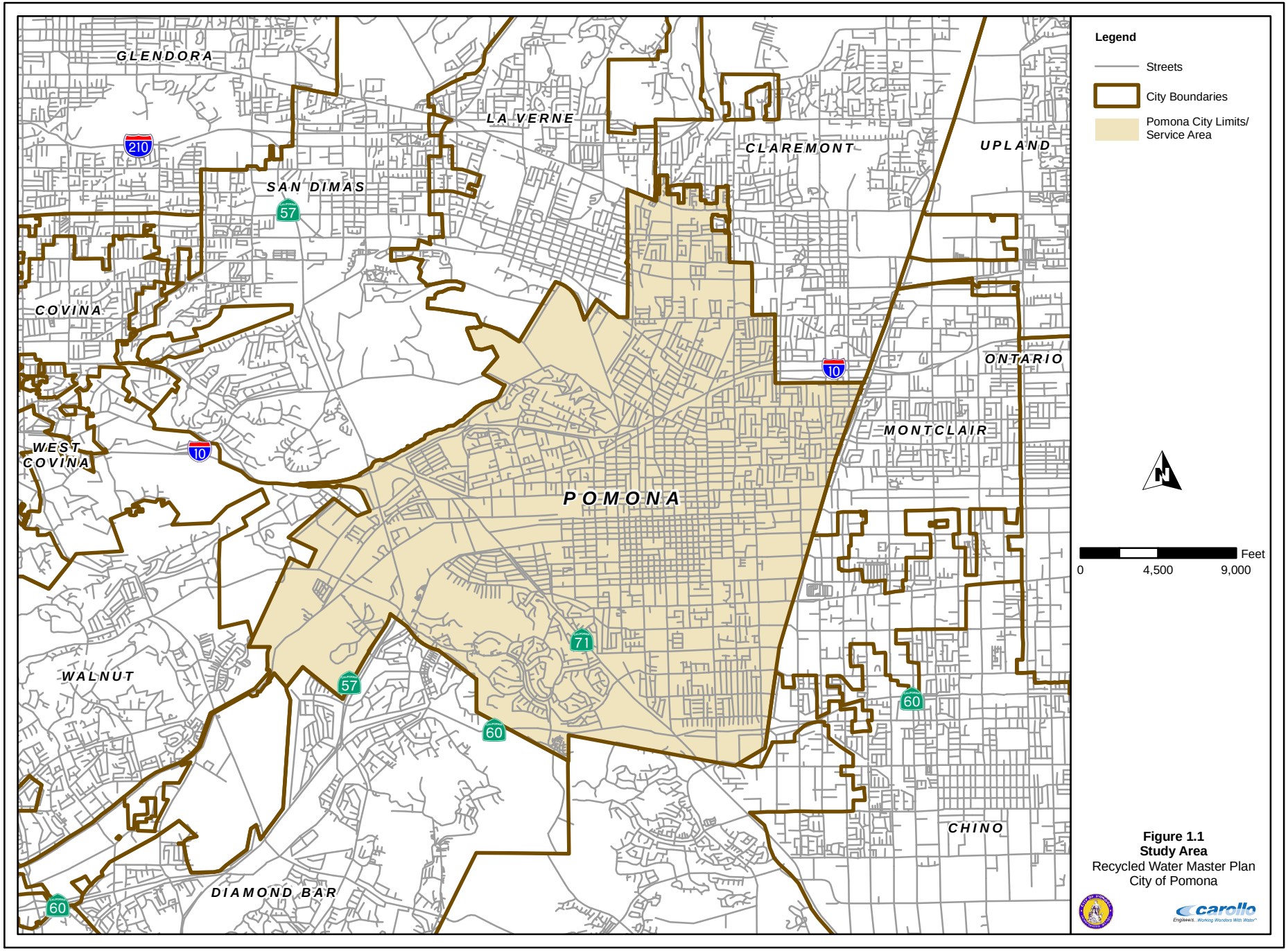

Figure 1.1
Study Area
Recycled Water Master Plan
City of Pomona

The City's existing recycled water system is located in the western part of the City. This RWMP evaluates the opportunities to expand recycled water service throughout the City's service area as well as to a select number of large potential recycled water customers in neighboring communities, such as Forest Lawn Cemetery in Covina Hills.

1.4 PROJECT OBJECTIVES

The intent of this project is to provide a RWMP that will guide the City as it develops and expands the current recycled water distribution system. Specific objectives are as follows:

- Reducing existing potable water use by supplying recycled water where appropriate.
- Expanding and fully subscribing the recycled water system.
- Optimizing the existing and future system configuration.

The plan culminates in a CIP that is intended to serve as guidance for the City to meet the desired objectives. The CIP identifies several recycled water projects for the City and outlines the recommended phasing of these projects, and includes planning level opinions of probable construction cost.

1.5 ACKNOWLEDGEMENTS

Carollo wishes to acknowledge and thank all of the City's staff for their support and assistance in completing this master plan. Special thanks go to Jim Taylor (Water/Wastewater Operations Manager), Raul Garibay, P.E. (Supervising Water Resources Engineer), Nichole Horton (Utility Engineering Associate), and Chris Brown (Water Production Supervisor).

The following Carollo staff was principally involved in the preparation of this RWMP:

Partner-in-Charge:	David Prasifka, P.E.
Project Manager:	Inge Wiersema, P.E.
Project Engineer:	Mark Bartlett, P.E.
Other Project Staff:	Tracy Clinton, P.E. (Market Assessment) Debra Dunn (GIS and Graphics)
Technical Review:	Richard Humpherys, P.E.

1.6 REPORT ORGANIZATION

This recycled water master plan is divided into 9 chapters. Chapter 2 presents the existing recycled water system. Chapter 3 discusses the current and future recycled water demands for both existing and potential customers. Chapter 4 summarizes the recycled water supplies and the pertinent regulations that impact the supply. Chapter 5 presents the planning and evaluation criteria. Chapter 6 summarizes the activities that were undertaken to develop and calibrate a hydraulic model. Using the planning and evaluation criteria, Chapters 7 and 8 evaluate and provide recommendations for the existing and future recycled water systems, respectively. Chapter 9 presents the CIP and financing options for the CIP.

EXISTING RECYCLED WATER SYSTEM

2.1 INTRODUCTION

This chapter provides a brief overview of the City of Pomona's (City's) existing recycled water system including descriptions of the existing recycled water distribution system/facilities, recycled water supply source, and recycled water demands.

A more detailed description of the recycled water distribution system pipelines and facilities is included in Chapter 6 (Hydraulic Model Development), while detailed descriptions of the existing and future recycled water supplies and demands are included in Chapter 3 (Recycled Water Demands) and Chapter 4 (Recycled Water Regulations and Supplies), respectively.

2.2 SERVICE AREA

The City's existing recycled water system is shown on Figure 2.1. As shown, the City currently provides recycled water to customers inside and outside the City's service area. However, the City's distribution system is entirely located within the City boundary as it delivers recycled water to two booster pumping stations (PS) at its city boundaries. These are:

- Cal Poly Pomona PS. This PS is located southwest of the interchange of Interstate 15 (I-15) and State Route 57 (SR-57). This PS boosts recycled water to a recycled water reservoir on the western part of the Cal Poly Pomona campus through a pipeline that is also owned and operated by Cal Poly Pomona.
- Bonelli Park PS. This PS is located just south of Interstate 10 (I-10) and west of SR-57. This PS boosts recycled water to a recycled water reservoir located in Bonelli Park, which serves Bonelli Park, the East Shore R.V. Park, and the Mountain Meadows Golf Course.

2.3 RECYCLED WATER DISTRIBUTION SYSTEM

The existing recycled water distribution system delivers recycled water from the Pomona Water Reclamation Plant (PWRP) to the City's recycled water customers. The pipeline system within the City's boundary has a combined length of approximately 3 miles and can be divided into the following three main pipeline segments:

- 20-inch diameter pipeline going east from the PWRP along Mount Vernon Avenue. This pipeline terminates at the City's two existing recycled water reservoirs and used to serve the two paper mill companies before their closure.

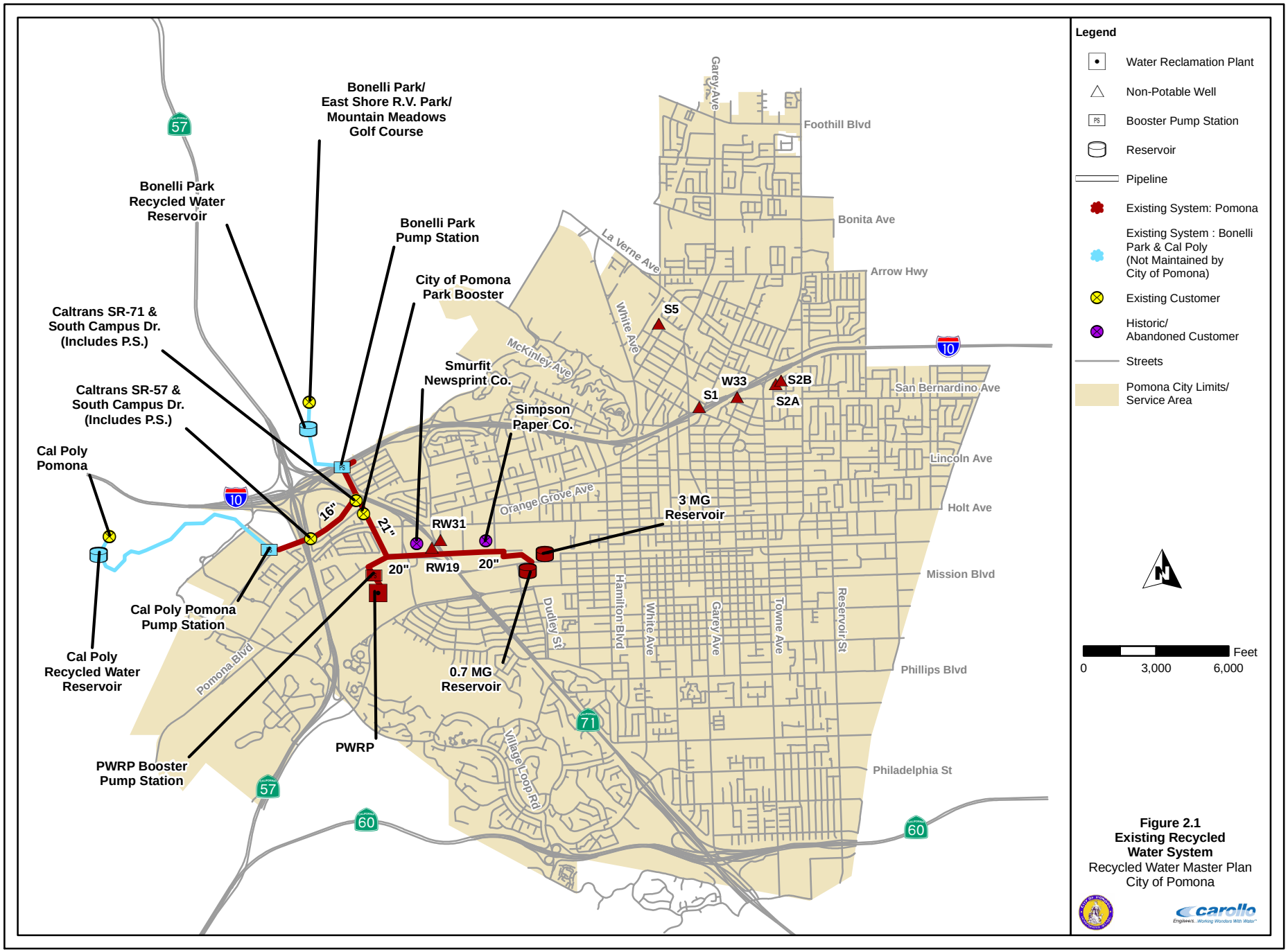

Figure 2.1
Existing Recycled Water System
Recycled Water Master Plan
City of Pomona

- 21-inch diameter pipeline going north along Ridgeway Street that terminates at the Bonelli Park Pump Station.
- 16-inch diameter pipeline going southwest along South Campus Drive that terminates at the Cal Poly Pomona Pump Station.

2.4 RECYCLED WATER FACILITIES

The City's recycled water system facilities can be divided into active and non-active facilities, and are shown on Figure 2.1. The City-owned facilities that are currently active consist of the PWRP booster pump station, Well 19, Well 31, a 0.7-million gallon (MG) reservoir, and a 3-MG reservoir. In addition, the City owns a number of non-potable wells in the northeastern part of the City near I-10 (Wells S5, S1, W33, S2A, and S2B). However, these wells are currently inactive and have limited production capacities as well as water quality constraints. It is therefore not likely that these wells will be repaired or utilized for recycled water supply.

Both Cal Poly and Bonelli Park have reservoirs and booster pump stations that they own and operate respectively. Caltrans has a booster pump for each of its connections to the distribution system.

A summary of the existing recycled water facilities is shown in Table 2.1.

Table 2.1 Recycled Water System Facilities
City of Pomona

City Owned and Operated	Location
PWRP Pump Station	295 S. Humane Way
3-MG Reservoir	1573 W. Second Street
0.7-MG Reservoir	1573 W. Second Street
Non-Potable Well 19	131 N. Bellevue Street
Non-Potable Well 31	302 Short Street
Customer Owned and Operated	
Caltrans - SR-71 Booster Pump	2761 S. Campus Drive
Caltrans - SR-57 Booster Pump	567 Ridgeway Street
Cal Poly Booster Pump Station	2801 S. Campus Drive
Cal Poly Recycled Water Reservoir	Cal Poly Campus
Bonelli Park Booster Pump Station	Ridgeway Street at San Jose Wash
Bonelli Park Recycled Water Reservoir	North of I-10 in Bonelli Park

2.5 POMONA WATER RECLAMATION PLANT

The PWRP is the City's primary recycled water source and supplies roughly 95 percent of the City's recycled water demand. The Sanitation Districts of Los Angeles County (SDLAC) owns and operates the PWRP. The plant has a capacity of 15 million gallons per day (mgd); however, flows vary from 4 to 15 mgd. The average plant production is approximately 9 mgd.

Between 1966 and 2001, the City contracted with the SDLAC for the right to purchase and sell all of the plant's effluent. When the City renewed its agreement with the SDLAC, the City contracted for the right to purchase and sell two-thirds of the plant's effluent flow. Consequently, the amount of recycled water available to the City has decreased by a third since 2001. Based on the average plant production, this equates to a reduction from 9 to 6 mgd available to the City.

2.6 SYSTEM OPERATIONS

The primary function of the recycled water system is to distribute recycled water from the PWRP to its customers. The PWRP treats influent flows according to Title 22 standards. After the last treatment process (disinfection), effluent is discharged over a free flowing weir into a small pump station wet well. It is from this wet well that the City's PWRP pump station draws recycled water. This wet well also acts as a splitter box that distributes two-thirds of the effluent flow to the PWRP pump station; however, if the remaining one-third is unused, this box has an overflow that diverts this unused flow to the City's pump station. Otherwise, any unused effluent overflows the box into San Jose Creek.

The PRWP pump station is level controlled by the City's two upstream recycled water reservoirs. The pump station activates when the reservoirs drop below 75 percent full, and pumps in the station deactivate either when the reservoirs are full or when the water level in the suction wet well drops. The City aims to maintain the reservoirs at 75 percent full due to seismic considerations, as water sloshing at higher levels could cause significant damage during a seismic event. When the reservoir level drops below 50 percent full, the City's two non-potable wells (Wells 19 and 31) are activated and supplement the recycled water supply.

2.7 EXISTING RECYCLED WATER CUSTOMERS

The locations of the City's existing recycled water customers are shown on Figure 2.1. Recycled water delivery records were compiled and the overall demands for the past six years are displayed in Table 2.2.

The consumption values include both existing and abandoned customers. As shown in Table 2.2, total demand decreased by about 30 percent from 2002 to 2003 due to the closing of the Pomona Paper Company. In May 2007, Smurfit paper mill closed, decreasing demand by about another 45 percent. Due to these two closures, the City's recycled water demand along the pressurized system decreased from approximately 7,000 acre-feet per year (ac-ft/yr) in 2002 to 2,200 ac-ft/yr in 2008. This significant demand reduction prompted the City to update its Recycled Water Master Plan (RWMP) and evaluate the best opportunities to serve new recycled water customers.

Table 2.2 Existing and Historical Recycled Water Demands
Recycled Water Master Plan
City of Pomona

Customers	Demand (ac-ft/yr)						
	2002	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Bonelli Park	929	795	855	774	795	937	920
Cal Poly Pomona	1,307	1,132	1,086	1,285	1,220	1,370	1280
Caltrans - SR 71	92	29	60	64	49	30	11
Caltrans - SR 57	55	30	17	14	6	25	0.14
City Parks Dept. - Park Booster	35	25	23	21	32	27	22
Pomona Paper Co. (1)	678	0	0	0	0	0	0
Smurfit Newsprint Co. (1)	3,830	2,883	3,706	3,440	3,340	515	0
Total Demand	**6,926**	**4,894**	**5,747**	**5,598**	**5,442**	**2,904**	**2,233**

Note:

(1) Pomona Paper Company closed in 2003; Smurfit Newsprint Company (also referred to as Blue Heron) closed in 2007.

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RECYCLED WATER DEMANDS

3.1 INTRODUCTION

This chapter presents a discussion of the City of Pomona's (City's) estimated recycled water demands. The City's historical recycled water demand is presented first, followed by a discussion of the recycled water demand factors and peaking factors that are used to estimate the recycled water demands of potential future recycled water customers. This chapter is concluded with the discussion of the recycled water demand projections, which includes a summary of the market field assessment that was conducted as part of this Recycled Water Master Plan (RWMP). Details of this market assessment can be found in Appendix B.

3.2 HISTORICAL RECYCLED WATER DEMAND

The locations of the City's existing recycled water customers and the existing recycled water distribution system are shown on Figure 3.1. As shown on this figure, the existing recycled water system within the City can be divided into the following two categories:

1. The existing pressurized recycled water system owned and operated by the City; and
2. The existing gravity recycled water system, which was sold in 2004 to the Sanitation Districts of Los Angeles County (SDLAC).

Recycled water delivery records from the customers served by the pressurized system were compiled and the overall demands for the past six years (2002-2007) are graphed in Figure 3.2. The consumption numbers include both existing and prior historical customers. As shown in Figure 3.2, total demand decreased by about 30 percent from 2002 to 2003 due to the closing of the Pomona Paper Company. In May 2007, Smurfit Newsprint Company closed, decreasing demand by an additional 45 percent. Due to these two closures, the City's recycled water demand along the pressurized system decreased from nearly 7,000 acre-ft per year (ac-ft/yr) in 2002 to 2,200 ac-ft/yr in 2008.

The annual demands of the City's recycled water customers served in the period 2002 through 2007 are listed in Table 3.1. As shown, the average day demand (ADD) in 2007 was about 2,400 ac-ft/yr or 2.1 million gallons per day (mgd). Figure 3.3 shows the estimated seasonal distribution of demand for the existing customers based on historical monthly demand averages for the period 2002 through 2007. As shown in this figure, the demands increase significantly during the summer due to higher temperatures and less precipitation.

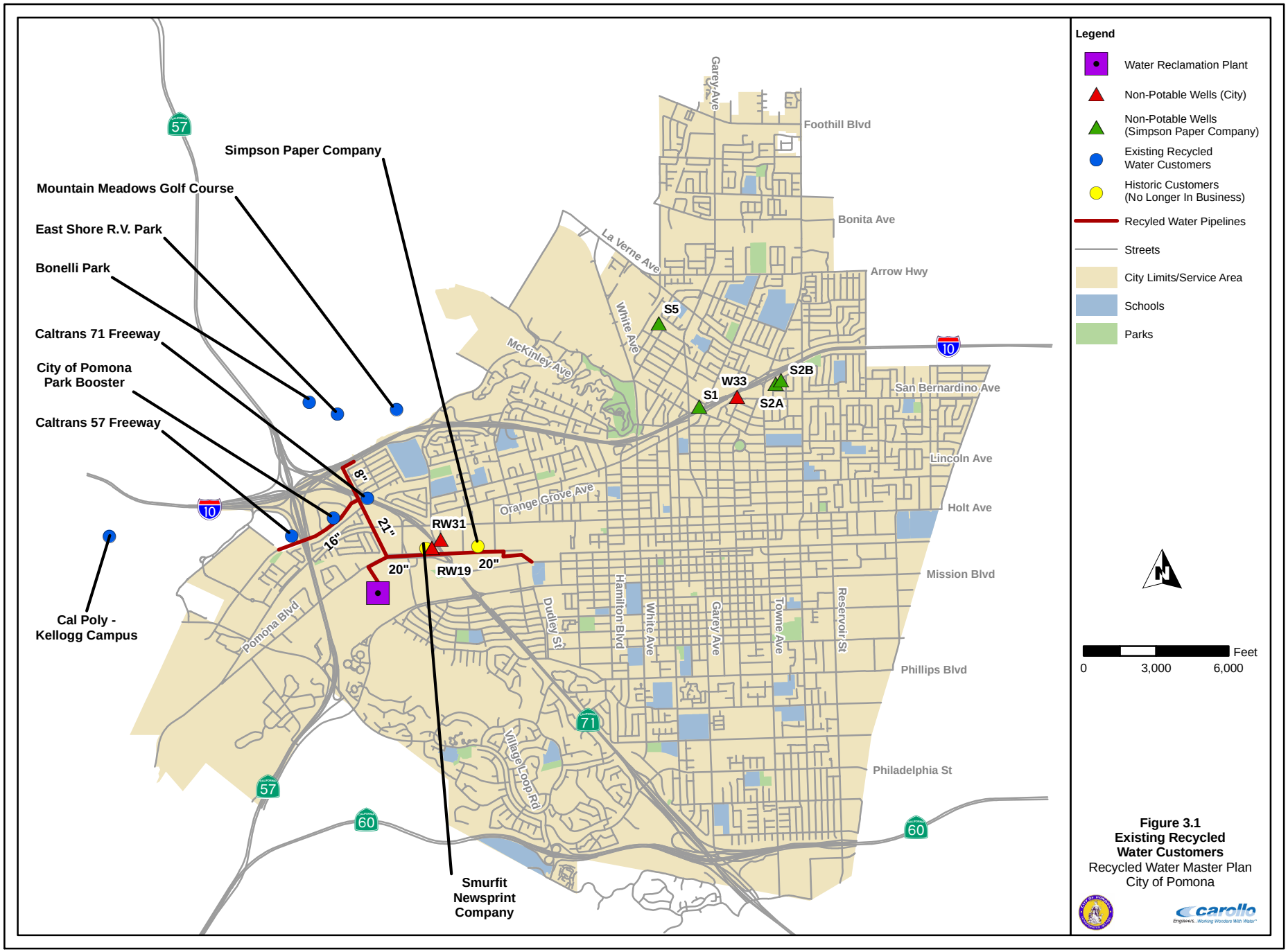


Figure 3.1
Existing Recycled Water Customers
Recycled Water Master Plan
City of Pomona

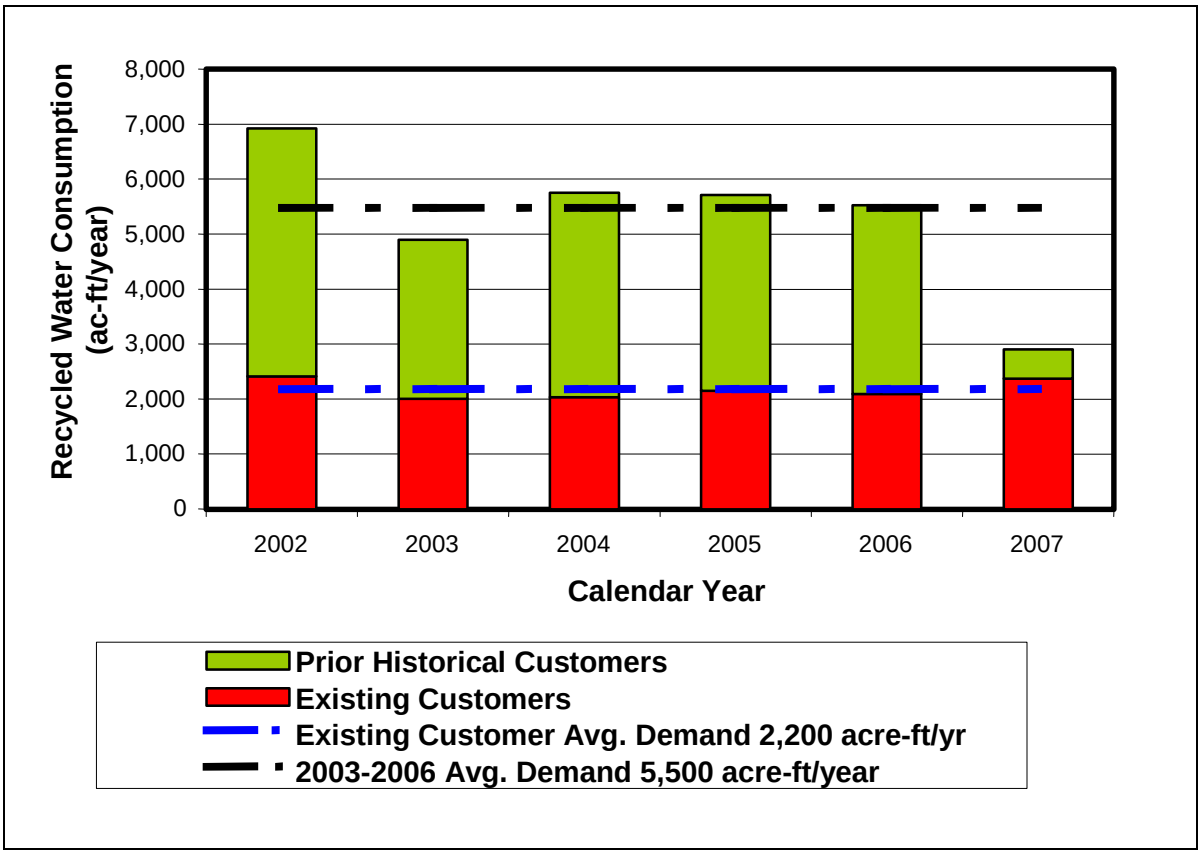


Figure 3.2 Historical Recycled Water Demand (2002-2007)

Table 3.1 Existing and Historical Recycled Water Demands
Recycled Water Master Plan
City of Pomona

Pressure System Customers	Demand (ac-ft/yr)					
	2002	2003	2004	2005	2006	2007
Pomona Paper Co.	678	0	0	0	0	0
Smurfit Newsprint Co.	3,830	2,883	3,706	3,440	3,340	515
Subtotal Prior Customers	***4,508***	***2,883***	***3,706***	***3,557***	***3,340***	***515***
Cal Poly Pomona	1,307	1,132	1,086	1,285	1,220	1,370
Bonelli Park	929	795	855	774	795	937
Caltrans - SR-71	92	29	60	64	49	30
Caltrans - SR-57	55	30	17	14	6	25
City Parks Dept.	35	25	23	21	32	27
Subtotal Existing Customers	***2,418***	***2,011***	***2,041***	***2,158***	***2,102***	***2,389***
Totals	**6,926**	**4,894**	**5,747**	**5,715**	**5,442**	**2,904**

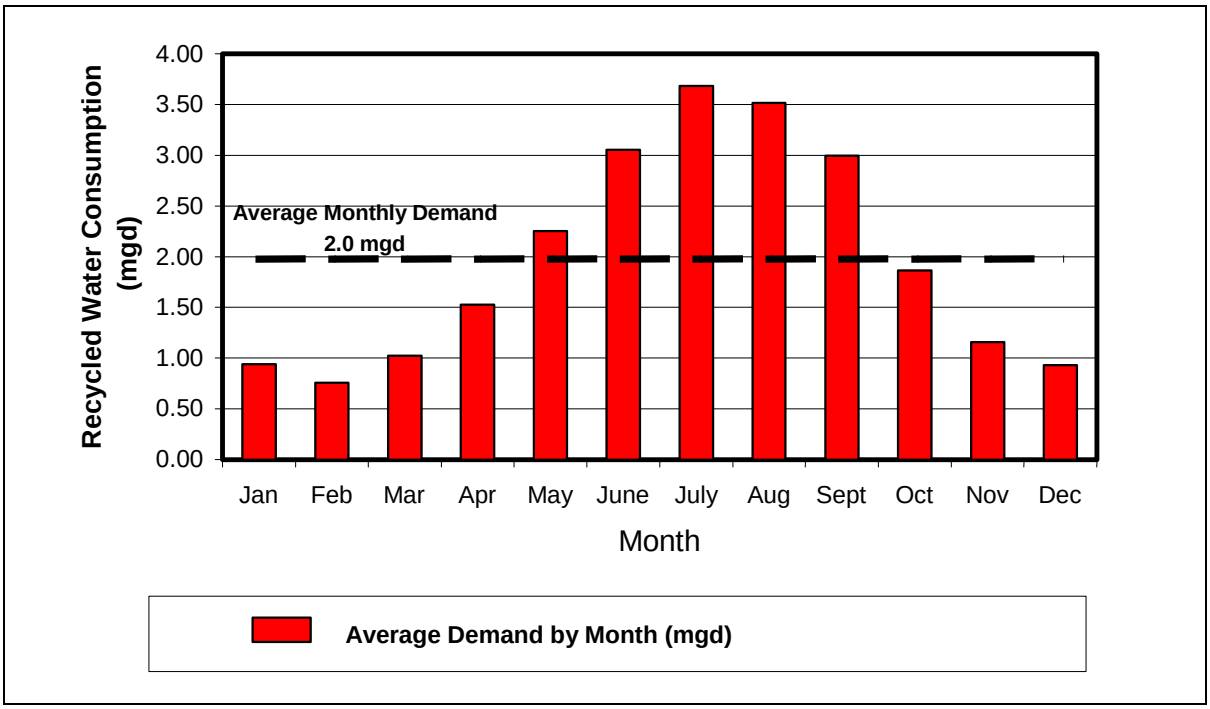


Figure 3.3 Seasonal Demand Distribution for Existing Customers

3.3 DEMAND FACTORS AND PEAKING FACTORS

This section discusses the water demand factors and peaking factors that were used to estimate future recycled water demands. The definitions of these factors are discussed below.

3.3.1 Water Demand Factors

A water demand factor (WDF) is defined as the estimated amount of water usage per area of a certain land use type. WDFs are typically expressed in gallons per day per acre (gpd/ac). These factors are used to estimate the ADD for existing and potential development areas by multiplying the WDF with the total number of acres of the corresponding land use category. WDFs are typically determined from a combination of historical billing records and land use information using spatial geographic information system (GIS) routines. WDFs can also be obtained and/or verified with WDFs from other municipalities with similar land use and climate conditions.

Climate

As stated above, irrigation demand is dependent on climate. The climate in Pomona is influenced by the San Gabriel Mountains to the north and the Chino Hills to the south with year-round average temperature highs ranging from the 60s to 90s and average lows between the 30s and 50s. The warmest months are June through September. The average monthly precipitation and average monthly temperature from years 1893 to 2007 are presented in Table 3.2 and shown graphically in Figure 3.4. The average annual precipitation for the area is 17.2 inches.

Table 3.2 Average Monthly Precipitation and Temperature Data
Recycled Water Master Plan
City of Pomona

Month	Average Precipitation (in/month)	Average. High Temperature (°F)	Average Low Temperature (°F)
January	3.65	65.4	37.9
February	3.53	67.7	40.2
March	2.90	70.1	42.2
April	1.26	74.0	45.4
May	0.36	77.7	49.8
June	0.10	84.0	53.3
July	0.01	91.0	57.5
August	0.07	91.0	57.8
September	0.27	88.4	55.1
October	0.77	80.7	49.7
November	1.49	73.2	42.4
December	2.72	66.5	38.3
Average	**1.43**	**77.5**	**47.5**

Source:

Western Regional Climate Center, Station No. 047050. Period of Record from November 1893 to December 2007 (CIMIS, 2007).

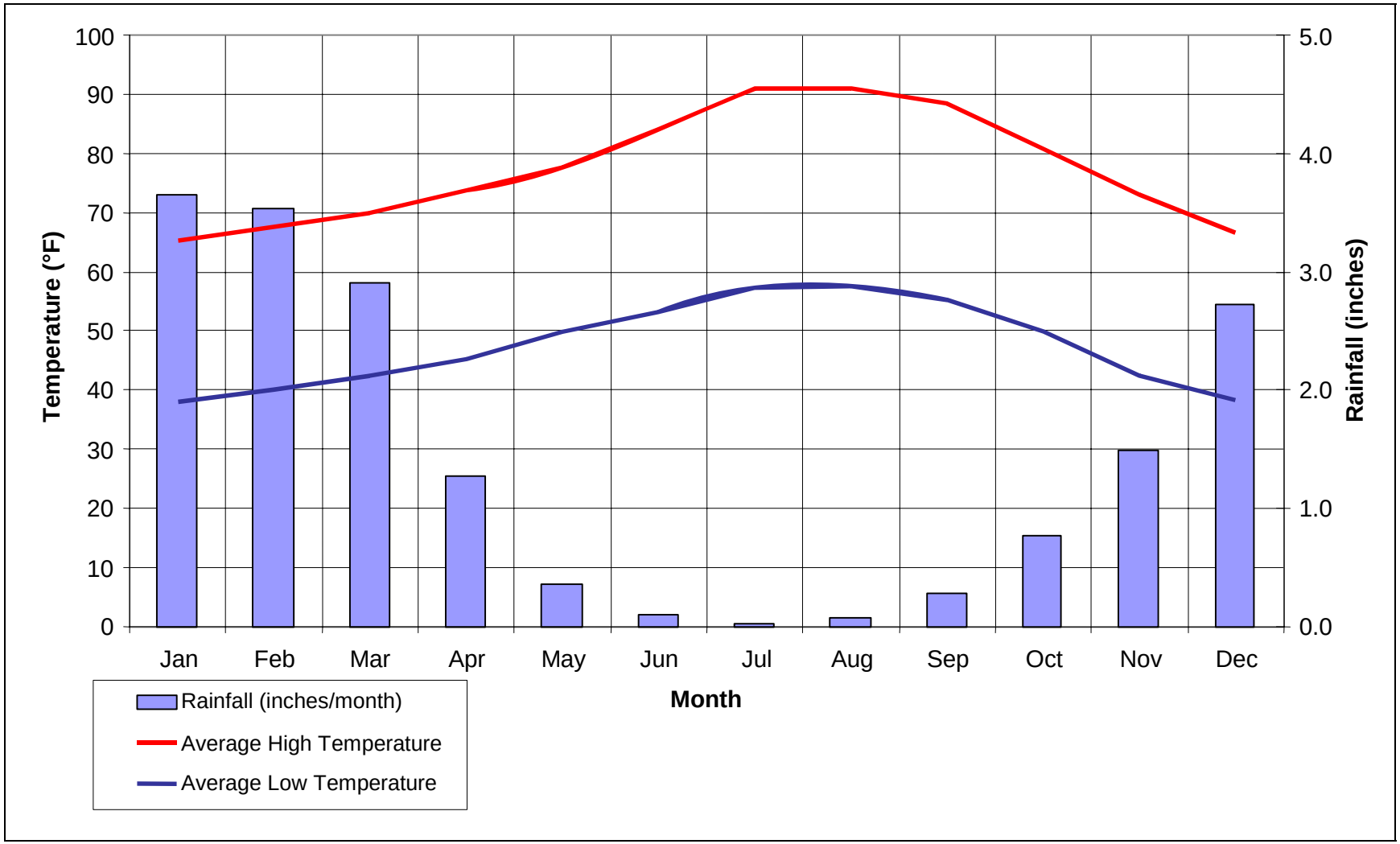


Figure 3.4 Annual Temperature and Rainfall Variation for Pomona

Irrigation Requirements

Landscape irrigation requirements for the City of Pomona were calculated based on evapotranspiration (ET) and rainfall data for all sites where irrigable acreage was available. Calculated irrigation requirements, as defined below, were used to estimate irrigation for all existing and future sites.

The amount of irrigation required for the potential irrigation customers is directly dependent on precipitation and evapotranspiration quantities in the region. To calculate the amount of evapotranspiration occurring in the study area, the following formula was used:

$$ET_L = K_L * ET_o \quad (1)$$

Where:

ET_L = Evapotranspiration of landscaped areas (in inches)
K_L = Landscape coefficient
ET_o = Reference Evapotranspiration (in inches)

The reference evapotranspiration used was based on the value for the Los Angeles Basin, which was obtained from the California Irrigation Management Information System (CIMIS).

To calculate the landscape evapotranspiration, the landscaped area crop coefficient was estimated using information contained in the "Guide to Estimating Irrigation Water Needs of Landscape Plantings in California" by the California Department of Water Resources. The landscape coefficient is the product of an average species factor (k_s), density factor (k_d), and microclimate factor (k_{mc}). These were estimated to be 0.7, 1, and 1, respectively. The landscape coefficient was then multiplied by the reference evapotranspiration to determine the average landscape evapotranspiration for the study area. The amount of precipitation, evapotranspiration, and calculated irrigation required for irrigation customers are listed in Table 3.3.

As listed in Table 3.3 and shown on Figure 3.5, the net annual average landscape irrigation requirement in the study area is approximately 34 inches per year or about 2.85 feet per year. Based on this data, recycled water demands were estimated at 2.85 ac-ft/yr for each irrigated acre. This equates to approximately 2,540 gpd/ac. Thus, the ADD of a 10-acre park is estimated at 28.5 ac-ft/yr or 0.025 mgd.

3.3.2 Peaking Factors

In addition to WDFs, peaking factors are used to estimate water demands for conditions other than ADD. Peaking factors account for fluctuations in demands on a seasonal or hourly basis.

Table 3.3 Average Annual Landscape Irrigation Requirements
Recycled Water Master Plan
City of Pomona

Month	Evapotranspiration [1] (inches)	Average Rainfall [2] (inches)	Net Irrigation Requirement [3] (inches)	Percent of Annual Net Irrigation Requirement [4] (%)
January	1.20	3.65	0.70 [5]	2%
February	1.42	3.53	0.70 [5]	2%
March	2.36	2.9	0.70 [5]	2%
April	3.18	1.26	2.59	8%
May	3.50	0.36	4.25	12%
June	4.06	0.1	5.36	16%
July	4.56	0.01	6.15	18%
August	4.47	0.07	5.96	17%
September	3.28	0.27	4.08	12%
October	2.44	0.77	2.25	7%
November	1.59	1.49	0.83 [5]	2%
December	1.20	2.72	0.70 [5]	2%
Total	**33.3**	**17.1**	**34.3**	**100%**

Notes:

(1) Source: The data was obtained from the California Irrigation Management Information System [2]. The ET values are adjusted for the landscape irrigation coefficient KL, where KL = Ks*Kmc*Kd which accounts for the species, microclimate and vegetation density.

(2) Source: Western Regional Climate Center (WRCC, 2007).

(3) [Evapotranspiration - Rainfall]*1.15/0.85. Where 0.85 = 85% Irrigation Factor and 1.15 = 15% Leaching Fraction (Ayers, 1985).

(4) Current month net irrigation requirement divided by total net irrigation requirement.

(5) Added to account for irrigation that occurs during the winter since winter storm events are not do not evenly distribute rainfall throughout the season.

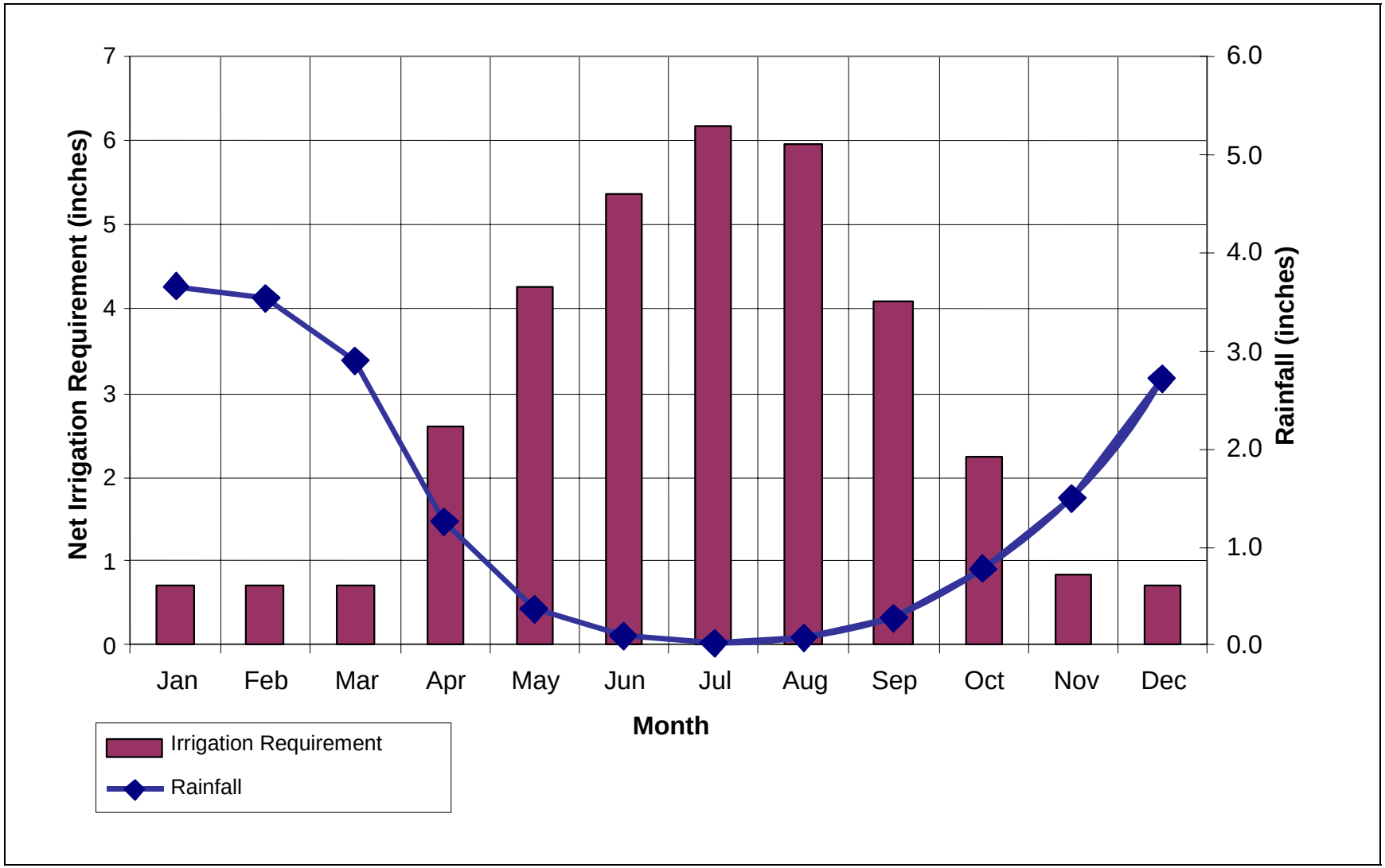


Figure 3.5 Annual Irrigation Requirement for the City of Pomona

Maximum Month Demand Factor

During hot summer days, water use is typically higher than on a cold winter day because of increased irrigation demands. Common peaking factors include maximum day demands (MDD), maximum month demands (MMD), and minimum day demands (MinDD). In recycled water systems, the MDD peaking factor is typically similar to the MMD peaking factor as irrigation sprinkler systems are typically only changed on a seasonal basis, rather than a daily basis, unless moisture sensors are used. For the purpose of this master plan, it is assumed that MMD and MDD are the same. Hence, the MMD/ADD ratio is used to estimate the MDD that the City needs to plan for.

The data listed in Table 3.3 was used to estimate the seasonal variation in landscape demands. The irrigation season runs from March through November, a period of nine months. Landscape irrigation demand peaks in July at approximately 6.15 inches, which is approximately 2.15 times higher than the average irrigation requirement of 2.85 inches (34.3 inches/12 months). Based on this ratio, a MMD peaking factor of 2.15 is used in this RWMP.

Hourly Peaking Factors

Variations in water demands also occur during a 24-hour period. Recycled water systems and areas that have substantial outdoor irrigation typically experience peak demand periods late at night through the early morning hours. While potable water systems in residential areas often experience two peak use periods, one in the morning during 6 a.m. and 8 a.m. and one in the early evening between 5 p.m. and 8 p.m.

Recycled water systems are characterized by substantial variations in demand during the day. Figures 3.6 through 3.10 present the diurnal curves for different types of irrigation and commercial customers that are used in this master plan.

For example, the diurnal curve shown on Figure 3.7 represents a typical usage pattern of customers that irrigate 12 hours per day, resulting in a peaking factor of 2.0. It was assumed that commercial and industrial customers use recycled water for either 12 or 16 hours during the day, resulting in a peaking factor of 2.0 or 1.5, respectively.

Golf courses were separated in two groups: 1) golf courses with lakes, and 2) golf courses without lakes. As lakes can be used to buffer irrigation water, it is assumed that golf courses with lakes would receive recycled water at a flat rate during 24 hours, which equates to a peaking factor of 1.0. Golf courses without lakes would be irrigated at night during 8 hours, which equates to a peaking factor of 3.0. This shorter timeframe is based on the time available between the closure of a golf course at night and a dry golf field in the morning when the first players arrive.

The peaking factors used in this master plan are summarized in Table 3.4.

Table 3.4 Peaking Factors Recycled Water Master Plan City of Pomona	
Demand Condition	**Peaking Factor**
Average Day Demand (ADD)	-
Maximum Month Demand (MMD)	2.15*ADD
Maximum Day Demand (MDD)(1)	2.15*ADD
Peak Hour Demand	
8-hour irrigation(2)	3.0*MMD or 6.45*ADD
12-hour irrigation(3)	2.0*MMD or 4.3*ADD
24-hour irrigation(4)	1.0*MMD or 2.15*ADD

Notes:
(1) As discussed above, MMD and MDD are assumed to have the same peaking factor.
(2) Golf courses without lakes.
(3) Highway medians, car washes, schools, parks, cemeteries, new developments and commercial.
(4) Golf courses with lakes.

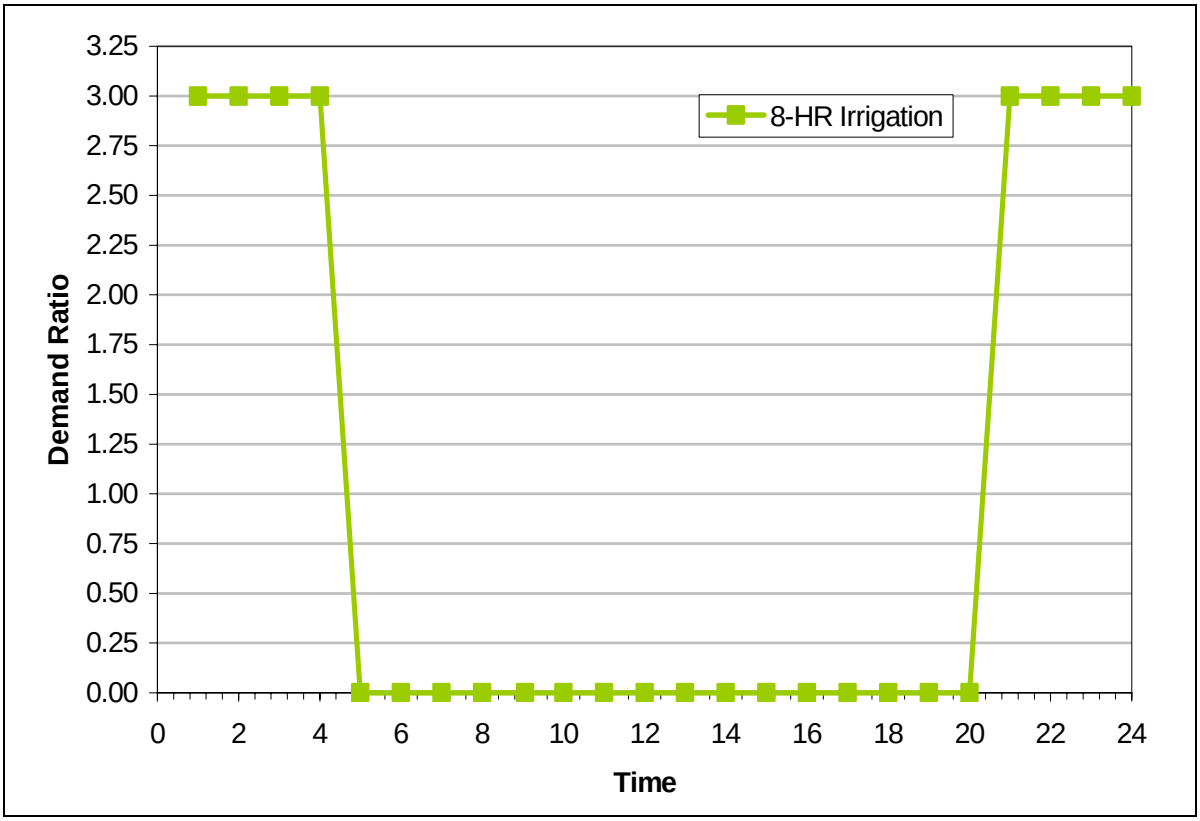


Figure 3.6 8-Hour Diurnal Curve for Irrigation

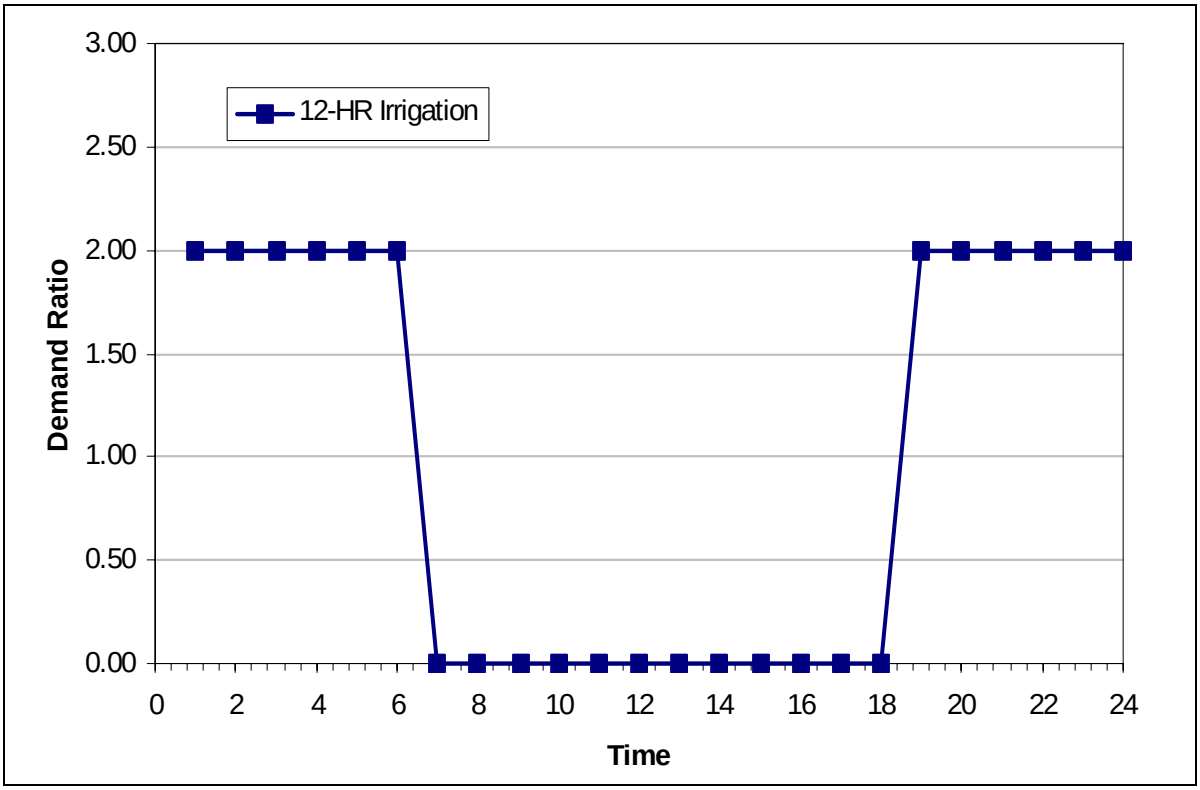


Figure 3.7 12-Hour Diurnal Curve for Irrigation Use

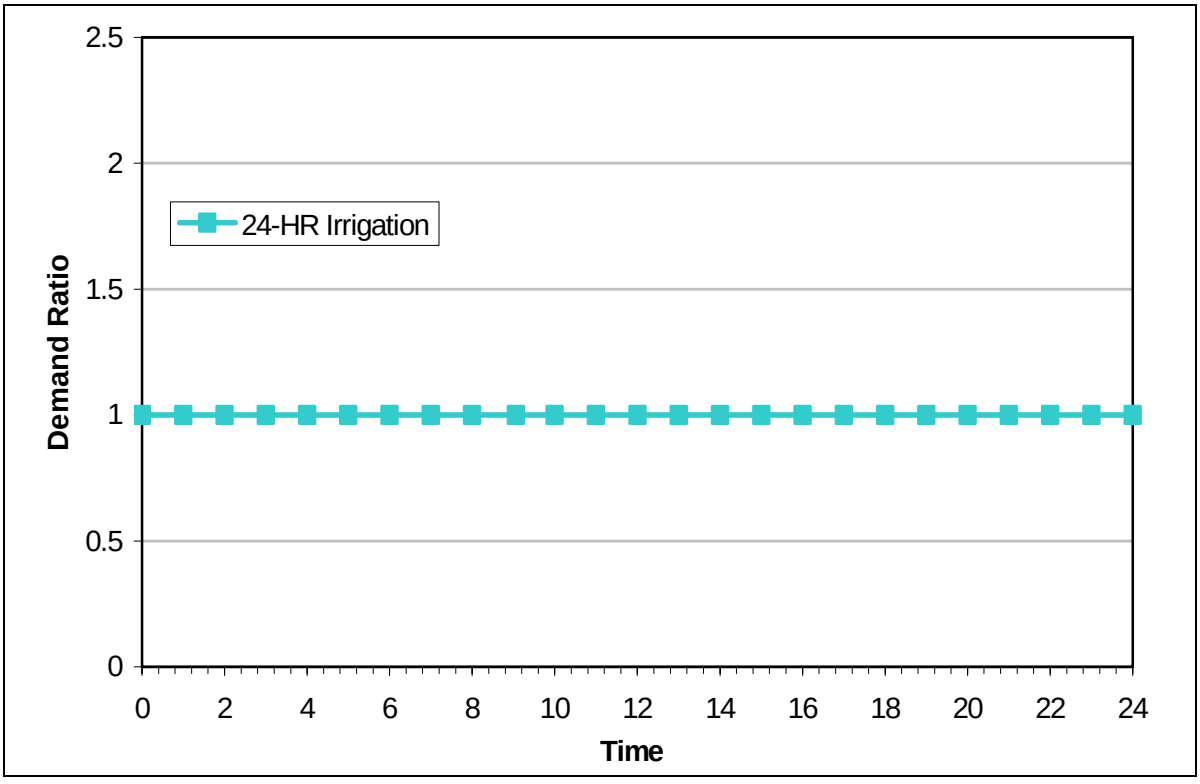


Figure 3.8 24-Hour Diurnal Curve for Irrigation Use

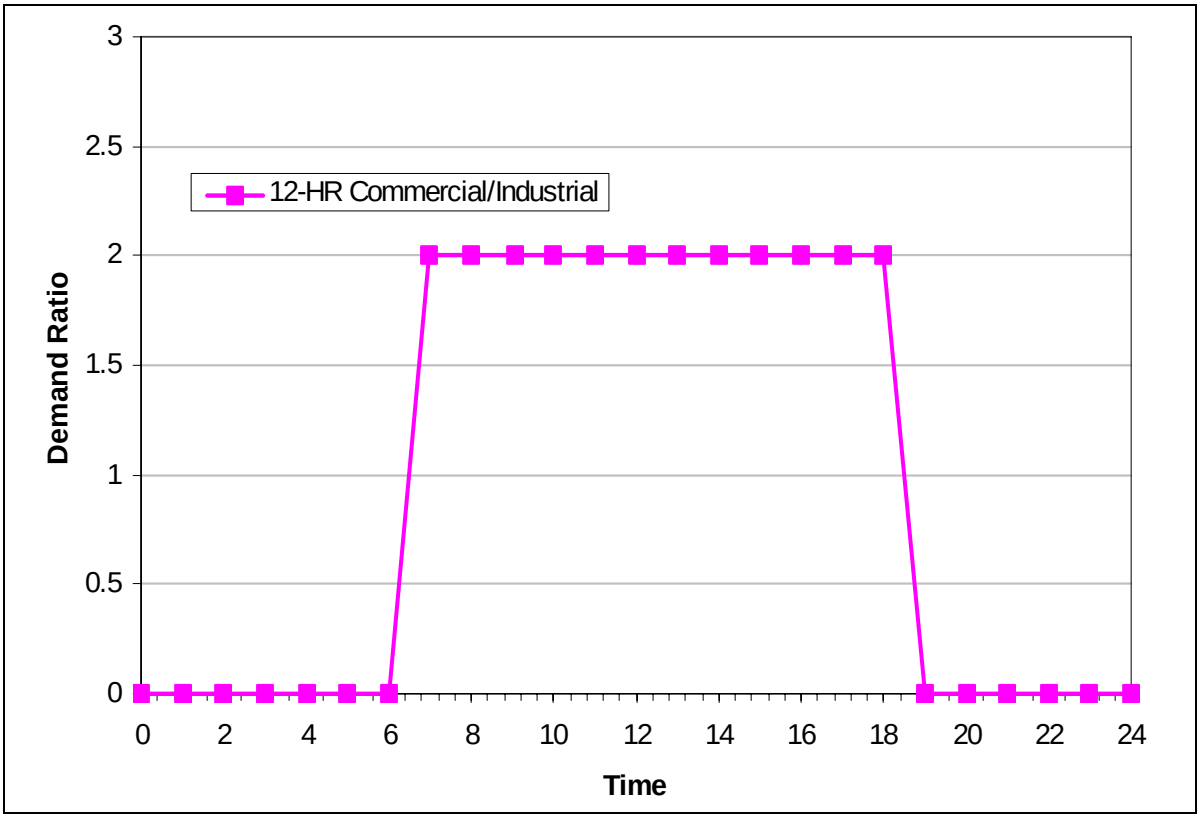


Figure 3.9 12-Hour Diurnal Curve for Commercial/Industrial

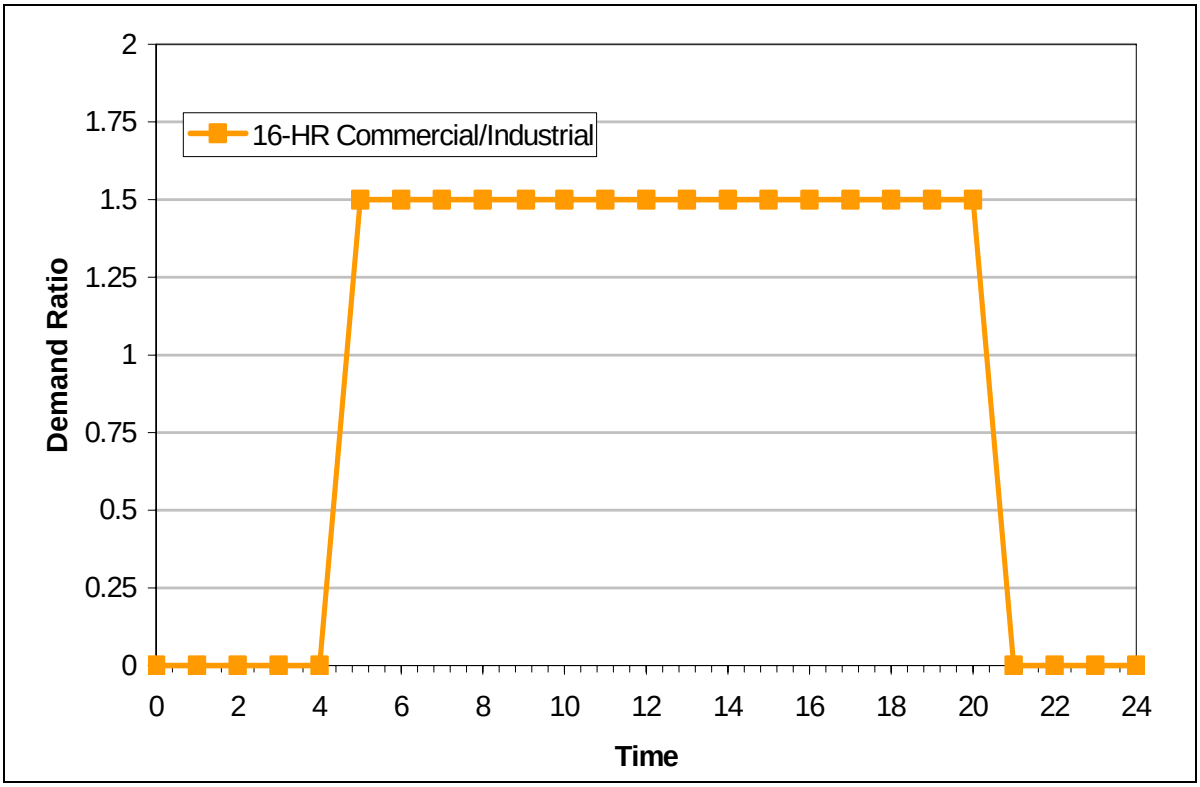


Figure 3.10 16-Hour Diurnal Curve for Commercial/Industrial

3.4 RECYCLED WATER DEMAND PROJECTIONS

The future recycled water demand projections are based on a combination of a review of the existing recycled water customers and the identification of potential future recycled water customers. This section describes the methodology used to project the future demand potential including the key findings of the market assessment that took place as part of this RWMP, and concludes with a future demand summary. It should be noted that the future demands described herein do not necessarily represent the actual future demands. This section is limited to identifying the future demand potential. The system analysis (see Chapter 7) determines the feasibility of serving these customers and identifies the preferred pipeline alignments to expand the existing recycled water system that will only serve a portion of the potential customers described in this chapter.

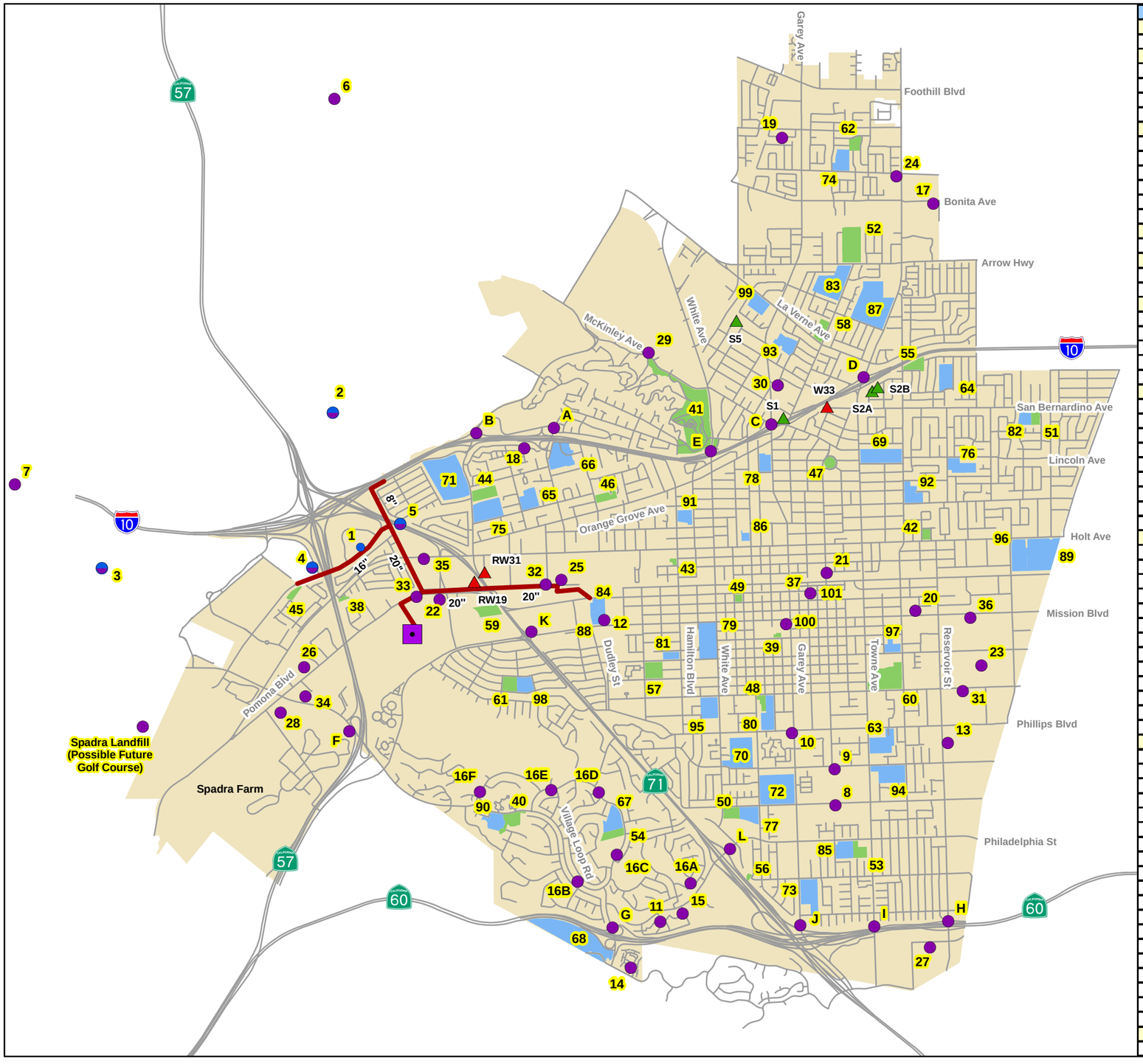
3.4.1 Methodology

To estimate the City's future recycled water demand, a list of potential recycled water customers was prepared using a combination of the following sources:

- Historical potable water billing records;
- Aerial photographs; and
- Specific plans for future developments from the City's Planning Department.

Based on the review of the available information and discussions with City staff, a list of over 100 potential new recycled water customers was compiled. The locations of these customers are shown on Figure 3.11, while a complete list with the estimated potential recycled water demand for each customer is listed in Appendix D. As shown in the table on this figure, customers were separated into ten categories, which are described in more detail below. These categories are:

- Existing customers
- Existing customers with additional supply needs
- Caltrans irrigation areas
- Neighboring cities
- Cemeteries
- Home Owner Associations (HOAs)
- Industrial/Commercial customers
- Parks
- Schools
- Specific Plans



Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
B	I-10 & Fairplex	H	SR-60 & Reservoir Rd.
C	I-10 & Garey	I	SR-60 & Towne
D	I-10 & Towne	J	SR-71 & Garey
E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
Potential Customers - Cemeteries			
7	Forest Lawn Mortuary	9	Pomona Cemetery
8	Holy Cross Cemetery		
Potential Customers - Homeowners Associations			
10	Amcal Portofino Villas	15	Phillips Meadows
11	Country Pk Villas	16	Phillips Ranch
12	Estates-Pomona Westland	17	Quail Creek Pomona
13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
20	Braun Linen Service	29	Pomona Fairplex
21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
37	Centennial Park	50	Mlk Jr Memorial Park
38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
40	Country Crossing Park	53	Philadelphia Park
41	Ganesha Park	54	Phillips Ranch Park
42	Garfield Park	55	Pomona Jaycee Park
43	Hamilton Park	56	Powers Park
44	John F. Kennedy Park	57	Ralph Welch Park
45	Kellogg Park	58	Ted Greene Park
46	Kiwanis Park	59	Veterans Park
47	Lincoln Park	60	Washington Park
48	Madison Park	61	Westmont Park
49	Memorial Park	62	Willie White Park
Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
66	Cortez Elementary	85	Philadelphia Elementary
67	Decker Elementary	86	Pomona Alternative (PAS)
68	Diamond Ranch Senior High	87	Pomona Senior High
69	Emerson Middle	88	Pomona Vocational
70	Fremont Middle	89	Pueblo Elementary
71	Ganesha Senior High	90	Ranch Hills Elementary
72	Garey Senior High	91	Roosevelt Elementary
73	Garey Village (HS)	92	San Antonio Elementary
74	Harrison Elementary	93	San Jose Elementary
75	John Marshall Middle	94	Simons Middle
76	Kingsley Elementary	95	Vejar Elementary
77	Lexington Elementary	96	Village Academy (HS)
78	Lincoln Elementary	97	Washington Elementary
79	Lopez Elementary	98	Westmont Elementary
80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Wells (City)
- Non-Potable Wells (Simpson Paper Company)
- Recyled Water Pipelines
- Streets
- City Limits/Service Area

Reycled Water Customers

- Existing Recycled Water Customers
- Existing Recycled Water Customers with Additional Supply Needs
- Potential Recycled Water Customers
- Potential Recycled Water Customers - Parks
- Potential Recycled Water Customers - Schools

0 3,000 6,000 Feet

Figure 3.11
Potential Recycled Water Customers
Recycled Water Master Plan
City of Pomona

carollo
Engineers...Working Wonders With Water™

Existing Customers with Additional Supply Needs

Existing customers with additional supply needs are typically the most feasible option for expanding an existing recycled water system. The benefit to cost ratio is high for existing customers as limited capital cost is required to serve these customers since most of the necessary infrastructure is existing.

Caltrans Irrigation Areas

It could be beneficial to expand service to additional Caltrans ramps and interchanges; however, expanding service is only beneficial if the interchanges are currently irrigated and if it would replace current potable water use.

Neighboring Cities

Neighboring cities could be served with recycled water. However, coordinating projects for connecting customers within the City requires less effort. Expanding service to a neighboring City could be beneficial if the City has a consistent volume of excess recycled water and/or if the customer location is relatively close to existing or planned recycled water pipelines.

Cemeteries, Home Owner Associations, Parks, and Schools

Cemeteries, parks, schools, and large irrigation users, such as HOAs, are typically the preferred customers due to their large demands. These customers and their locations typically drive the layout of recycled water systems, and can be converted easily to recycled water use if separate plumbing for the irrigation lines exists.

Industrial/Commercial Customers

Industrial customers are sometimes the predominant application of recycled water in certain cities or areas. In general, recycled water may be used if it is fully contained within the commercial or industrial process and the general public does not come in direct contact with the recycled water. Recycled water may be used in industrial or commercial facilities for purposes such as; processing, mechanical car washes, toilet flushing, street sweeping, cooling, commercial laundries, concrete mixing, and sanitary sewer flushing.

Specific Plans

Specific Plans for future developments present a unique opportunity for recycled water use, as the location and installation of recycled water distribution infrastructure can be implemented during initial construction of the development. This results in lower construction time and cost compared to construction in existing developments where pavement repair and traffic control would be required.

3.4.2 Market Assessment

The City coordinated data requests and interviews of some of the key potential users listed in Table 3.5 to determine the feasibility of using or expanding recycled water usage in the City. Through these interviews and information requests the following information was obtained:

- Interest in using recycled water.
- The estimated percentage of potable water that could be offset with recycled water.
- Existing irrigable acres and future irrigable acres.
- Typical weekly and diurnal usage pattern.
- Existing infrastructure and conversion issues.

The following 13 customers were interviewed by Carollo Engineers and City staff between July 21 and July 23 of 2008.

- Frank G. Bonelli Regional Park
- Forest Lawn Mortuary, West Covina Hills
- California State Polytechnic University, Pomona
- Pomona Unified School District
- Pomona Parks Department
- Structural Composites, Inc.
- Recycled Wood Products
- Pomona Fairplex
- City of San Dimas
- Braun Linen
- Estates Pomona Westland (Mobile Home Park)
- Caltrans (57, 71 and 10 Freeways)
- Lanterman Hospital

Customer information sheets were compiled for each of the interviews. These sheets are included in Appendix B. In addition, Appendix C contains data requested from those potential customers who were not directly interviewed. Through these interviews and requests, a number of key system expansion issues were identified. These issues are summarized in Table 3.5.

Table 3.5 Market Survey Summary
Recycled Water Master Plan
City of Pomona

Site No [1]	Customer Name	Potential Demand (ac-ft/yr)	Expansion Issues
2	Bonelli Park	1,210[2]	More recycled water could potentially irrigate areas of the park which are not currently irrigated; The County must find the money for improving the current private recycled water pumping system.
3	Cal Poly Pomona	1,530[2]	A possible golf course at the existing Spadra Landfill site will require additional supply. However, the landfill is currently served by the Walnut Valley Water District recycled water connection.
A -L	Caltrans	137	Recycled water use could be expanded; however, this might not be as beneficial for the City as other uses since Caltrans gets a preferred rate. In addition, if the ramps or interchanges are not irrigated, then the recycled water could be more beneficial if it replaces a current potable water use.
6	City of San Dimas	430	The City of San Dimas would like to draw water from Puddingstone Reservoir in Bonelli Park. To do this, the City of San Dimas would like to run a pipeline in the storm channel right-of-way between Bonelli Park and their golf course. Coordinating efforts for both upgrading the Bonelli Park pumping system and obtaining the right-of-way for the new pipeline could prove difficult and be cost prohibitive.
7	Forest Lawn Mortuary	330	Forest Lawn and Cal Poly Pomona need to know if the City will be able to meet the demands of the University irrigation system if Forest Lawn is connected to the University's reservoir. Forest Lawn could have the appropriate infrastructure in place within 2 years and wants a 50-year agreement with the City for the delivery of recycled water.
8 - 9	Holy Cross and Pomona Cemeteries	123	Both cemeteries want to continue using their existing onsite wells for irrigation.
16 (A-F)	Phillips Ranch	211	The community along with the City Parks Department maintains an extensive trail system.
17	Quail Creek	24	The community currently uses potable water to refill its ornamental ponds.

Table 3.5 Market Survey Summary
Recycled Water Master Plan
City of Pomona

Site No [1]	Customer Name	Potential Demand (ac-ft/yr)	Expansion Issues
20	Braun Linens	314[2]	Braun needs to determine the effects, if any, that the recycled water constituents will have on the detergents that are currently used. Braun could possibly need plumbing modifications to prevent cross connections.
25	Ecoplast Corporation	3	The company might need to move to a large site because the current facility might not handle the present growth of the company.
28	Lanterman Hospital	70	The hospital currently has a connection to the gravity recycled water line that is owned by the SDLAC. Due current state budget constraints, it is unlikely that the hospital will have the funding to connect to a potential recycled water main in the near future.
29	Fairplex	100	Use of recycled water for dust control needs Regional Board approval. In the future, the Fairplex intends to expand the amount of onsite vegetation.
31	Recycled Wood Products	27	Use of recycled water for dust control needs Regional Board approval. The company would like a letter of intent from the City.
34	Structural Composites	24	The health department will need to approve the use of recycled water for cleaning the cylinders of breathing apparatuses.
63-99	PUSD	602	Additional plumbing may be needed in some schools to prevent cross connections.

Notes:
(1) Site numbers correlate to the site numbers in Figure 3.11.
(2) Estimated demand for year 2030.

3.4.3 Demand Summary

Based on the customer data obtained during the interviews, demand estimates were prepared for 11 of the key potential customers. The potential recycled water demands of the remaining customers were estimated using a combination of WDFs, irrigation area estimates from reports or aerial photography, and potable water billing records. The projected recycled water demand estimates are summarized by category in Table 3.6. A list of recycled water demand estimates for all potential customers is included in Appendix D.

Table 3.6 Customer Demand by Category Recycled Water Master Plan City of Pomona		
Customer Category [1]	**Existing System Demand (ac-ft/yr)**	**Potential Future System Demand [3] (ac-ft/yr)**
Existing Customers	2,189 [2]	2,834
Caltrans Irrigation Areas	0	137
Neighboring Cities	0	428
Cemeteries	0	455
Home Owner Associations	0	281
Industrial/Commercial Users	0	741
Parks	0	587
Schools	0	687
Specific Plan Areas	0	0
Total	**2,189**	**6,150**

Notes:
(1) Details by category are presented in Appendix D.
(2) Average Existing Demand in year 2008.
(3) Potential Demand in year 2028

As shown in Table 3.6, the total potential recycled water demand associated with all potential customers identified on Figure 3.11 is estimated to be approximately 6,150 ac-ft/yr or 5.49 mgd. Using a MDD/ADD peaking factor of 2.15, this equates to a demand of approximately 11.8 mgd during the summer months (however, the actual MDD is approximately 11.6 mgd since industrial commercial customers MDD/ADD is 1.6 not 2.15). The estimated seasonal variation of these potential customers is shown on Figure 3.12, while the demands of the top 25 customers are summarized in Table 3.7.

It should be noted that the demand estimates presented in this chapter are the sum of all potential recycled water demand in the entire City. The feasibility to serve these potential customers considering water supply availability and distribution system expansion cost is discussed in Chapter 7 of this master plan.

Table 3.7 Top 25 Customers Recycled Water Master Plan City of Pomona					
Site No [1]	**Customer Name**	**2008 AAD (ac-ft/yr)**	**2008 MMD (mgd)**	**2030 AAD (ac-ft/yr)**	**2030 MMD (mgd)**
3	Cal Poly Pomona	1,240	2.38	1,530	2.93
2	Bonelli Park	855	1.64	1,211	2.32
63-99	PSUD	687	1.30	687	1.32

Table 3.7 Top 25 Customers
Recycled Water Master Plan
City of Pomona

Site No [1]	Customer Name	2008 AAD (ac-ft/yr)	2008 MMD (mgd)	2030 AAD (ac-ft/yr)	2030 MMD (mgd)
37-62	City Parks	587	1.1	587	1.1
6	City of San Dimas	356	0.68	428	0.82
20	Braun Linen	157	0.22	315	0.45
16 (A-F)	Phillips Ranch HOA	212	0.41	212	0.41
7	Forest Lawn	257	0.49	331	0.63
4-5 & A-L	Caltrans	77	0.15	214	0.41
29	Fairplex	100	0.19	100	0.19
9	Pomona Cemetery	100	0.19	100	0.19
33	Robertson's Ready Mix	63	0.09	63	0.09
28	Lanterman Hospital	68	0.13	72	0.14
23	Calif. Acrylic Industries	31	0.05	31	0.05
24	Mt. San Antonio Gardens (Congregational Homes)	33	0.06	33	0.06
35	W.R. Meadows	27	0.04	27	0.04
31	Recycled Wood Products	26	0.04	26	0.04
34	Structural Composites	24	0.03	24	0.03
8	Holy Cross Cemetery	24	0.05	24	0.05
17	Quail Creek	23	0.05	23	0.05
1	Park Booster	17	0.03	17	0.03
14	Hidden Valley	17	0.03	17	0.03
26	Gemini Aluminum Corporation	13	0.02	13	0.02
30	Pomona Valley Hospital Medical Center	14	0.03	14	0.03
27	Hehr Corporation	10	0.01	10	0.01

Note:
(1) Site numbers correlate to the site number in Figure 3.11.

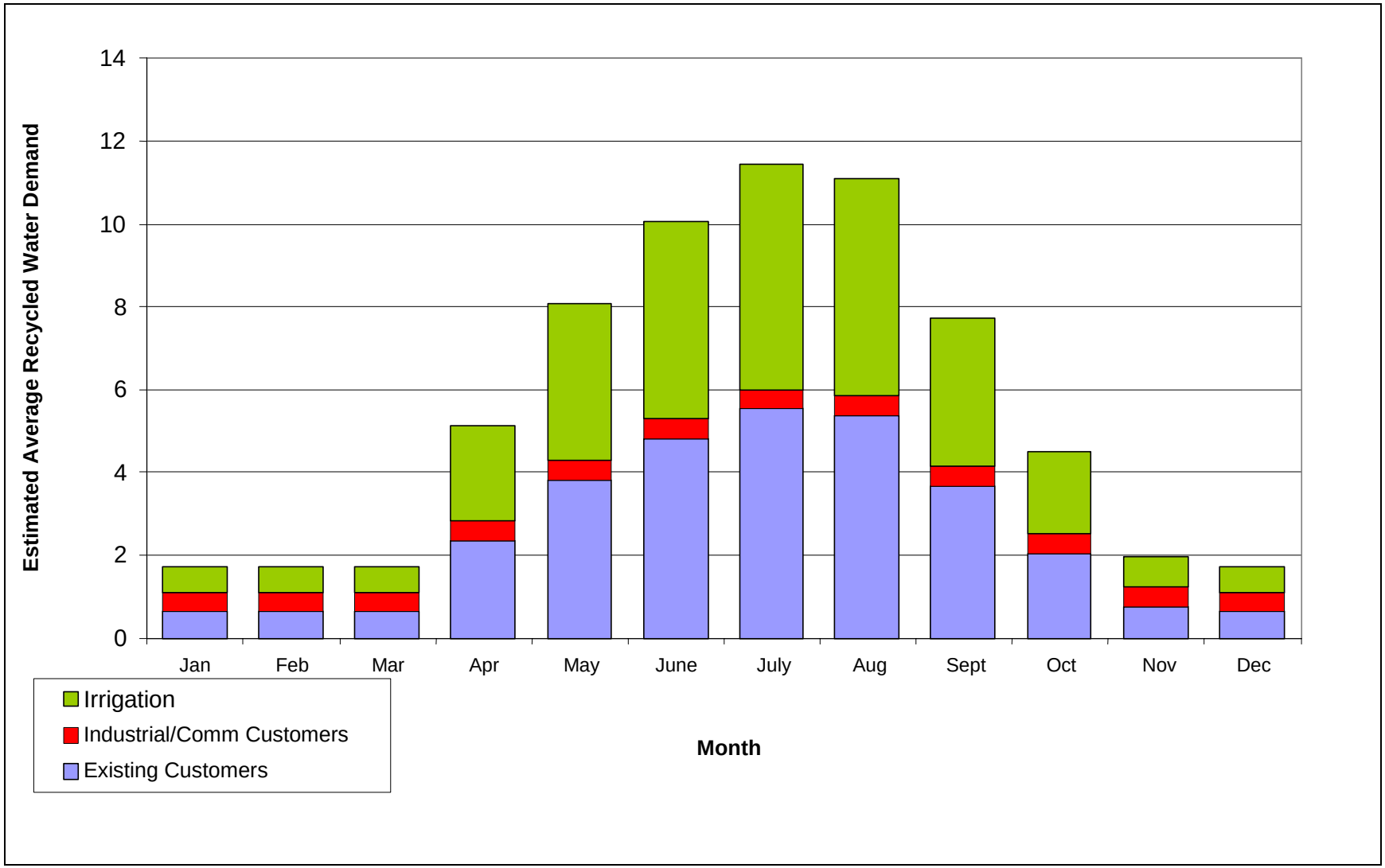


Figure 3.12 Potential Monthly Recycled Water Demand

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RECYCLED WATER REGULATIONS AND SUPPLIES

4.1 INTRODUCTION

This chapter identifies the supply and related storage needs required to meet the projected recycled water demands identified in Chapter 3.

This chapter starts with a description of the current and anticipated recycled water regulations and their impact on the ability to serve certain customer types. Subsequently, the existing and potential recycled water supply sources and their capacities are described and summarized.

4.2 RECYCLED WATER STANDARDS

This section is divided into the following four subsections. The current state and federal water quality standards are described followed by the on-going developments in the State of California. These discussions are followed by a description of the current developments on the City of Pomona's (City's) recycled water ordinance, the City's Best Management Practices (BMPs), and recommendations.

4.2.1 State and Federal Water Quality Standards

While wastewater discharges are governed by both federal and state requirements, currently there are no federal regulations that directly govern water recycling practices in the United States. As of November 2002, about 25 states, including California, have passed regulations pertaining to the use of recycled water. In addition, 16 states have adopted recycled water design standards or guidelines.

In California, the current state statutes towards recycled water are outlined in the California Water Code (CWC), Division 7, Water Quality, Chapters 7 and 7.5, Sections 13500 through 13583. According to CWC Section 13522.5, all water purveyors that use or propose to use recycled water, must file a report with the appropriate Regional Water Quality Control Board (RWQCB), which is overseen by the State Water Resources Control Board (SWRCB). The RWQCB in consultation with the Department of Public Health (DPH) evaluates the requests. If necessary to protect public health, safety, or welfare, the RWQCB may prescribe water recycling requirements where recycled water is proposed or used.

The 1996 Memorandum of Agreement (MOA) between the DPH, SWRCB, and the RWQCBs on the use of recycled water allocates primary areas of responsibility and authority between these agencies. The DPH is the primary state agency responsible for public health, whereas the SWRCB and the RWQCB are the primary state agencies charged with protection, coordination, and control of water quality. These agencies work together to develop discharge permits for recycled water projects. Generally, the DPH

interprets the laws dictated by the California Code of Regulations (CCR) applicable to reclamation and makes recommendations on individual projects to the RWQCB. The RWQCB issues the final permit for water reclamation projects.

The DPH is required to establish uniform statewide recycling criteria for the various uses of recycled water to assure protection of public health where recycled water use is involved (CWC Section 13521). DPH has approved regulatory criteria in Title 22, Division 4, Chapter 3, Section 60301 *et seq.* of the CCR. Title 22 regulatory criterion includes specified approved uses of recycled water, numerical limitations and requirements, treatment method requirements and performance standards. In addition, the Department of Public Safety (DPS) and the RWQCBs also enforce Title 17, Division 1, State Department of Health Services, Chapter 5, Sections 7583 through 7605. This Title outlines regulations that prevent recycled water from back flowing into domestic water supplies.

The recycled water uses allowed by Title 22 are dependent on the effluent quality of the supply source. The Pomona Water Reclamation Plant (PWRP) effluent is classified as 'Disinfected Tertiary Recycled Water' as defined by Title 22. Table 4.1 summarizes the criteria needed for unrestricted Title 22 use of disinfected tertiary recycled water for irrigation, supply for impoundment, supply for cooling, and supply for other uses.

Table 4.1 Summary of Effluent Quality for Unrestricted Title 22 Use
Recycled Water Master Plan
City of Pomona

Treatment	Oxidized, Coagulated (or Filtered), and Disinfected
BOD_5	Not Specified
TSS	Not Specified
Turbidity	2 NTU (Average)
	5 NTU (Maximum)
Total Coliform MPN (1)	2.2/100 mL (Average)
	23/100 mL (Maximum in 30 days)

Note:

(1) No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters during any 30-day period

The effluent from the Pomona Water Reclamation Plant meets or exceeds these requirements. As such, the recycled water may be used for all applications listed in Table 4.2.

Table 4.2 Summary of Approved Title 22 Recycled Water Uses Recycled Water Master Plan City of Pomona
Irrigation Uses:
Food crops where recycled water contacts the edible portion of the crop, including all crop roots
Parks and playgrounds
School yards
Residential landscaping
Unrestricted-access golf courses
Any other irrigation uses not prohibited by other provisions of the California Code Requirements
Cemeteries
Freeway landscaping
Pasture for milk producing animals for human consumption
Fodder and fiber crops and pasture for animals not producing milk for human consumption
Supply for Impoundment:
Non-restricted recreational impoundments, with supplemental monitoring for pathogenic organisms
Restricted recreational impoundments and publicly accessible fish hatcheries
Landscape Impoundments without decorative fountains
Supply for Cooling and Air Conditioning:
Industrial or commercial cooling or air-conditioning involving cooling tower, evaporative condenser, or spraying that creates mist
Industrial or commercial cooling or air-conditioning not involving cooling tower, evaporative condenser, or spraying that creates mist
Other Allowed Uses:
Flushing toilets and urinals
Priming drain traps
Industrial process water that may contact workers
Structural fire fighting
Decorative fountains
Commercial laundries
Soil compaction
Dust control on roads and streets
Flushing sanitary sewers
Consolidation of backfill material around potable water pipelines

Table 4.2 Summary of Approved Title 22 Recycled Water Uses Recycled Water Master Plan City of Pomona
Other Allowed Uses (continued):
Artificial snow making for commercial outdoor use
Commercial car washes, not heating the water, excluding the general public from washing processes
Industrial process water that will not come into contact with workers
Industrial boiler feed water
Non-structural fire fighting
Mixing concrete
Cleaning roads, sidewalks, and outdoor work areas
Other Uses Subject to RWQCB Approval:
Groundwater recharge (permits issued on a case-by-case basis by the RWQCBs)

For more information about Title 22 requirements, one may consult the latest compilation of recycled water laws (formerly known as the "Purple Book") at: *http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Lawbook.aspx.*

4.2.1.1 Statewide Recycled Water Policy

In May 2009, the SWRCB also recently adopted a statewide recycled water policy. The impetus for the development of a statewide recycled water policy, enforcement and permitting process stems from the current water crisis a need to streamline and expedite the use of recycled water throughout the state. This policy acknowledges the current potable water crisis and addresses recycled water use in a manner consistent with existing state and federal laws. The purpose of the policy would be to provide direction to the RWQCBs and the public on the appropriate criteria for issuing permits for recycled water projects. The policy follows Title 22 requirements and intends to streamline recycled water use through the following measures:

- Permitting Criteria. The policy will establish criteria that will streamline the permitting process for recycled water projects in a consistent manner. These criteria will expedite projects and will also allow the RWQCBs to focus resources on projects with site-specific conditions. The SWRCB is in the environmental documentation and public review stage of a draft general permit for landscape irrigation uses of recycled water.

- Mandated Recycled Water Use. The SWRCB would establish a mandate to increase the use of recycled water by 200,000 acre-feet per year (ac-ft/yr) by 2020 and by an additional 300,000 ac-ft/yr by 2030. Agencies not providing a downstream beneficial use for recycled effluent are required to make it available on reasonable terms. Existing legislation considers it a waste if recycled water is not utilized when available

(Water Code Sections 13550 *et seq*.). As part of this new policy, the SWRCB would exercise its authority pursuant to Water Code Section 275 to enforce the aforementioned mandates. The mandates are contingent on the availability of sufficient capital funding for the construction of recycled water projects from private, local, state, and federal sources.

- Salt Nutrient Management Plans. Within five years, all basins would have to develop salt and nutrient management plans. Such plans will help areas meet water quality objectives on a basin wide basis instead of restricting individual recycled water projects.
- Streamlining of Recycled Water Use Permits. Applications are approved within 120 days by the Regional Board if certain criterion is met.
- Anti-Degradation. Groundwater recharge projects are approved depending on a basins capacity to assimilate the increased concentrations of chlorides and other compounds that are present in recycled water. If necessary, projects would need to implement anti-degradation measures in order to gain approval. Recycled water use projects that meet streamlined criteria in a basin with a salt and nutrient management plan do not need to perform an anti-degradation investigation.
- Funding. The SWRCB will request priority funding for storm water and recycled water projects from Department of Water Resources (DWR).

Additional measures are implemented to ensure that recycled water use does not adversely affect groundwater basin quality. Such measures include:

- Monitoring of Groundwater Basins. Monitoring wells are required. Data are submitted to the Regional Board every three years. This monitoring is required for salt and nutrient management plans.
- Chemicals of Emerging Contaminants. An expert panel will recommend a monitoring program for these contaminants. Groundwater recharge projects are required to test and monitor chemicals of emerging contaminants (CECs).
- Landscape Irrigation Projects. Landscaping projects using recycled water are required to control the incidental runoff of recycled water through measures that include, but are not limited to, the following practices: proper sprinkler heads; an operations and management plan (can apply to multiple sites); and limited irrigation during precipitation events.

The policy does not have a significant impact on the City; however, the City will need to take the necessary steps as stated in the policy to prevent incidental runoff from landscape irrigation. The City is currently planning to utilize the maximum amount of available recycled water possible. If an agency producing recycled water is not using it for a beneficial use as defined in the policy, that agency needs to provide that water to a purveyor on reasonable terms. In the future, the City may want to monitor this policy to determine if any additional funding assistance will be available.

A summary of existing and future statutes and regulations along with the pertinent available guidance documents is listed in Table 4.3.

Table 4.3 Summary of California Recycled Water Regulations
Recycled Water Master Plan
City of Pomona

Description
Draft Legislation
Groundwater Recharge Reuse
Regulations
Title 22, Division 4, Environmental Health, Chapter 3
Title 17, Division 1, State Department of Health Services, Chapter 5
Statewide Recycled Water Policy
Statutes
Health and Safety Code, Division 6, Part 1, Sanitary Districts Act of 1923, Chapter 4
Water Code, Division 7, Water Quality, Chapters 7 & 7.5
Guidance Documents
Preparation of an Engineering Report for the Production, Distribution and Use of Recycled Water
Sources:
http://www.cdph.ca.gov/healthinfo/environhealth/water/Pages/Waterrecycling.aspx (CDPH, 2009a)
http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Lawbook.aspx (CDPH, 2009b)

Regardless of the approved regulatory uses in Title 22, the City is limited to those uses stated in either its individual permit, or in a general permit that covers multiple users in the area. Any additional use of recycled water that follows outside an identified use in the permit would need approval from the local RWQCB.

4.2.2 State Developments

As shown in Table 4.3, a new state policy is in development for groundwater recharge. In addition, the RWQCB for the Los Angeles region has issued a tentative General Water Reuse Order.

4.2.2.1 Regional Water Quality Control Board, Los Angeles Region

Concurrent with the development of the statewide recycled water policy, the Los Angeles Regional Board has issued a tentative General Water Reuse Order (see Appendix F). The intent of the Order is to streamline the permitting process and delegate the responsibilities of recycled water programs to local agencies. In addition, the Order would act as a region wide general permit for publicly owned wastewater and water agencies. Currently, each producer in the county is covered under an individual permit; however, these permits do not allow producers to extend recycled water use to applications not stated in their original permit. This general permit extends the application of recycled water to additional uses that may not have been included in the original permits of many of the recycled water producers in the county.

Additional uses that would be covered under the Order include:

- Industrial boiler feed;
- Nonstructural fire fighting;
- Backfilll consolidation around non-potable piping;
- Soil compaction;
- Mixing concrete;
- Dust control on roads and streets;
- Cleaning of roads, sidewalks, and outdoor work areas; and
- Industrial process water that will not come into contact with workers.

Approval of this Order will impact the City of Pomona. Due to the nature of Pomona's existing water recycling permit, RWQCB Los Angeles Region Order 83-34, Section B restricts use to irrigation (agriculture and landscape), fire protection, and paper manufacturing. During the time this study was being conducted, Pomona had to apply for a specific "concrete mixing" use permit for Robertson's Ready Mix. Pomona was required to generate a supplementary engineering report (see Appendix F) and provide full as-built drawings for the new recycled service. If the tentative General Water Reuse Order would have previously been adopted, the client and the City would have saved valuable time and resources.

4.2.2.2 Groundwater Recharge

If the City were to decide to pursue groundwater recharge with recycled water, a new permit would be needed. No current regulations are in effect regarding intentional replenishment of groundwater with recycled water. However, the DPH issued Draft Groundwater Recharge Reuse Regulations in August 2008 that contain treatment requirements that have been implemented for projects with an indirect potable reuse or a recharge component. Currently,

the RWQCBs review groundwater recharge projects on a case-by-case basis. If the City decided to pursue groundwater recharge, additional potential items will include, but are not limited to the following:

- Engineering Assessment of Potential Sites. A suitable site needs to be located for the recharge operation. The size of the required site and the method of recharge are dependent on geological conditions that vary by location.
- Water Quality. The City's current permit does not allow groundwater recharge. The City would need to obtain a new permit from the RWQCB. An engineering study would also be needed. The study would probably have to include the potential salt loading that would take place.
- Basin Management. The City would need to negotiate storage agreements with the entities using or controlling a potential recharge basin within the City. These basins include the Chino Basin, and Six Basins.

4.2.3 Potential City Ordinance

According to the current statues and regulations, users suitable for recycled water may be required to use recycled water. The CWC empowers the City to pass ordinances that mandate recycled water use as distribution infrastructure becomes available.

The City is currently preparing a mandatory use ordinance (see Appendix F). The ordinance will be based on similar ordinances in the Los Angeles area. The ordinance should consider the future expansion of the recycled water system and consider provisions such as dual plumbing. In the future, dual plumbing will allow the City to easily connect users so that recycled water can be used for toilet flushing and landscape irrigation.

4.2.4 City Best Management Practices (BMPs)

The City currently does not have any BMPs related to recycled water. The City is obligated to follow the BMPs in its recycled water permit for its supply sources. Such BMPs include provisions such as not irrigating during periods of precipitation and vector control. If the tentative Reuse Order issued by the Los Angeles RWQCB is approved and the Sanitation Districts of Los Angeles County (SDLAC) gives a notice of intent for permit coverage, the City would also need to abide by any additional BMPs listed in Appendix E of the Reuse Order.

4.2.5 Recommendations

As described previously, the quality of the recycled water is suitable for all approved Title 22 uses; however, the City is limited to those uses stated in the PWRP permit and the recently approved County Board General Water Reuse Order. Additionally, the City would be restricted to uses indicated in the permit for any additional outside source. The Water Reuse Order issued by the Los Angeles RWQCB could impact Pomona's recycled water

program by allowing streamlined permitting of additional uses currently not covered in the existing permit for the PWRP. The recycled water policy will also help to streamline additional uses of recycled water; however, the City would need to work with the producer of the recycled water in order to gain approval for additional uses. The City should monitor the implementation of Recycled Water Policy to determine if any funding assistance will be available for future projects that expand the use of recycled water. If the City expands the use of its recycled water system, an ordinance that calls for dual plumbing would be beneficial to the City, as it would ensure that users would subscribe to the system. Such an ordinance will also allow the City to more easily connect new projects in the future.

4.3 SUPPLY CAPACITY EVALUATION

According to the existing regulations, almost all customers identified in Chapter 3 can offset their potable water use with recycled water. According to the data collected in Chapter 3, the supply needs of the City are about 5.49 mgd and 11.56 mgd for AAD and MMD demands, respectively, if all potential customers are included. Figure 4.1 summarizes the supply needs for the City.

4.3.1 Existing Supply Sources

Currently, the main supply for the City's recycled water system is the SDLAC Pomona Water Reclamation Plant (PWRP). The City also has three non-potable wells, two of which (Wells 19 and 31) are connected to the existing system and one (Well 33), which is currently abandoned due to water quality issues. These existing supply sources are shown on Figure 2.1. The amount of supply available from each existing source is discussed in the following sections.

4.3.1.1 Pomona Water Reclamation Plant (PWRP)

As of 2001, the City of Pomona has rights to receive two-thirds of the effluent flow from the PWRP. Prior to 2001, the City's had rights to receive 100 percent of the plant effluent.

Although the plant has an average annual flow (AAF) capacity of 15 mgd, typical plant flows vary between about 4 and 15 mgd during a typical 24-hour period, resulting in an average daily flow of about 9.0 mgd. Figure 4.2 shows a typical diurnal curve for plant effluent flow, while Figure 4.3 shows the historical average plant flow from 1993 through 2007. As shown in Figure 4.3, the average plant flow of the PWRP over the past 15 years (1993–2008) has been about 9 mgd. When considering the flow rate from 2001, when the City's two-thirds allocation took affect, the average plant flow for the City was about of 5.6 mgd.

In the future, it is assumed that PWRP influent flow will slightly increase and stabilize. Consequently, an average plant flow of 9.0 mgd is assumed for this report, thereby supplying the City with 6.0 mgd. These supply values were confirmed in discussions with the SDLAC staff. Meeting notes from these discussions are included in Appendix E (Project Correspondence).

4.3.1.2 Non-Potable Groundwater Wells

In addition to the PWRP, the City has three non-potable wells, Wells 19, 31, and 33 and four non-potable wells of the former Simpson Paper Company.

Wells 19 and 31 are located in the southwest area of the City and are already connected to the existing recycled water system as shown on Figure 2.1. These two wells have a combined capacity of about 1 mgd.

Well 33 is located in the northeast area of the City and is thereby a considerable distance from the existing recycled water distribution system and is therefore not connected at this point. If connected, Well 33 would add about 0.2 mgd to the total non-potable well capacity.

As it is unlikely that Well 33 could be connected to the City's recycled water system; it is assumed for the supply planning purposes of this master plan that the total potential non-potable well capacity is 1.0 mgd.

In addition, the City owns four non-potable wells of the Simpson Paper Company. If included in the supply, the wells would contribute an additional 2.3 mgd. However, these wells are old and are in need of significant repair. The water quality of the wells is questionable and measurements have not been taken in years. Due to these uncertainties, these wells are not considered as a potential future supply source.

4.3.1.3 Water Quality

Water quality from these existing sources was analyzed to determine any use restrictions that may exist for irrigation uses. Water quality data was tabulated and compared to existing criteria for irrigation use restrictions. This data is summarized in Table 4.4.

As shown in Table 4.4, there are no severe restrictions on the City's supplies of recycled water. However due to the some water quality parameters, the use of recycled water may not be suitable for some sensitive plant species. As there are no parameters that fall in the severe restriction category, the City should be able to use their existing recycled water sources for its irrigation demands with proper quality management.

Demand By Area	AAD (mgd)	MMD (mgd)
Existing Service Area		
Existing Demand	1.96	4.21
Potential Demand	1.64	3.46
South of SR-71		
Potential Demand	0.41	0.88
North of I-10		
Potential Demand	0.53	1.14
City Eastside 1		
Potential Demand	0.51	0.92
City Eastside 2		
Potential Demand	0.44	0.95
Total	**5.49**	**11.56**

Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
B	I-10 & Fairplex	H	SR-60 & Reservoir Rd.
C	I-10 & Garey	I	SR-60 & Towne
D	I-10 & Towne	J	SR-71 & Garey
E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
Potential Customers - Cemeteries			
7	Forest Lawn Mortuary	9	Pomona Cemetery
8	Holy Cross Cemetery		
Potential Customers - Homeowners Associations			
10	Amcal Portofino Villas	15	Phillips Meadows
11	Country Pk Villas	16	Phillips Ranch
12	Estates-Pomona Westland	17	Quail Creek Pomona
13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
20	Braun Linen Service	29	Pomona Fairplex
21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
37	Centennial Park	50	Mlk Jr Memorial Park
38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
40	Country Crossing Park	53	Philadelphia Park
41	Ganesha Park	54	Phillips Ranch Park
42	Garfield Park	55	Pomona Jaycee Park
43	Hamilton Park	56	Powers Park
44	John F. Kennedy Park	57	Ralph Welch Park
45	Kellogg Park	58	Ted Greene Park
46	Kiwanis Park	59	Veterans Park
47	Lincoln Park	60	Washington Park
48	Madison Park	61	Westmont Park
49	Memorial Park	62	Willie White Park
Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
66	Cortez Elementary	85	Philadelphia Elementary
67	Decker Elementary	86	Pomona Alternative (PAS)
68	Diamond Ranch Senior High	87	Pomona Senior High
69	Emerson Middle	88	Pomona Vocational
70	Fremont Middle	89	Pueblo Elementary
71	Ganesha Senior High	90	Ranch Hills Elementary
72	Garey Senior High	91	Roosevelt Elementary
73	Garey Village (HS)	92	San Antonio Elementary
74	Harrison Elementary	93	San Jose Elementary
75	John Marshall Middle	94	Simons Middle
76	Kingsley Elementary	95	Vejar Elementary
77	Lexington Elementary	96	Village Academy (HS)
78	Lincoln Elementary	97	Washington Elementary
79	Lopez Elementary	98	Westmont Elementary
80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Existing Recycled Water Customers with Additional Supply Needs
- Potential Recycled Water Customers
- Water Reclamation Plant
- Non-Potable Wells (City)
- Non-Potable Wells (Simpson Paper Company)

Recycled Water Customers

- Existing Recycled Water Customers
- Recyled Water Pipelines
- Streets
- Potential Recycled Water Customers - Schools
- Potential Recycled Water Customers - Parks

Demand Areas

- Existing Service Area
- South of SR-71
- North of I-10
- City Eastside 1
- City Eastside 2

Feet
0 3,000 6,000

Figure 4.1
Recycled Water Supply Needs
Recycled Water Master Plan
City of Pomona

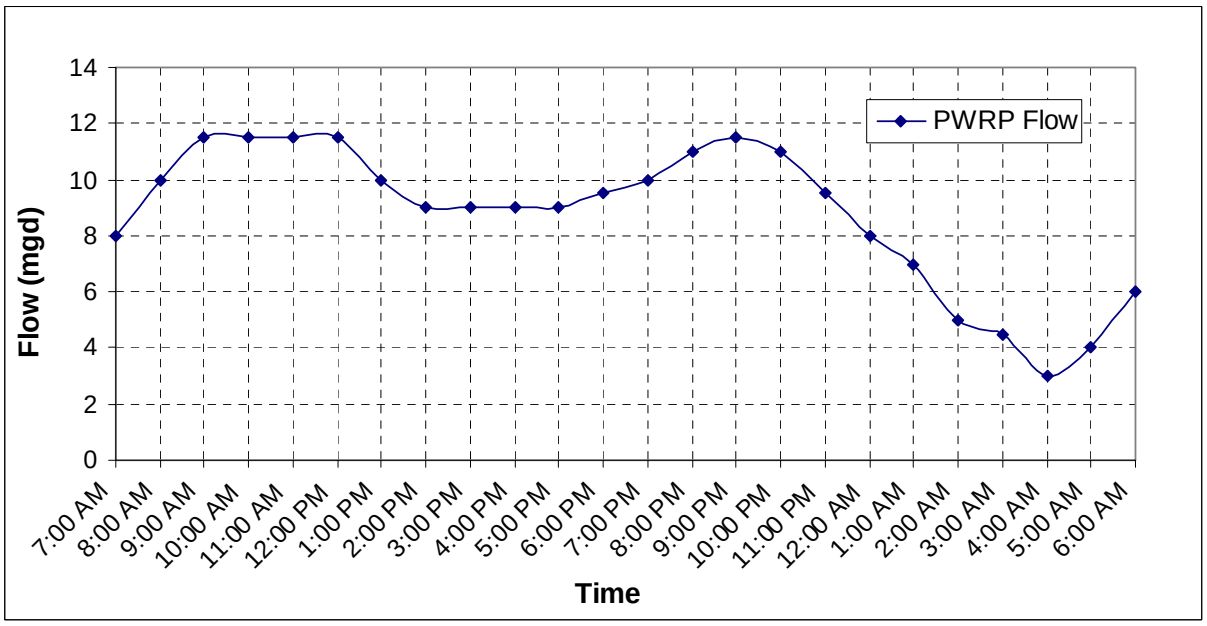

Figure 4.2 Pomona Water Reclamation Plant - Typical Diurnal Flow

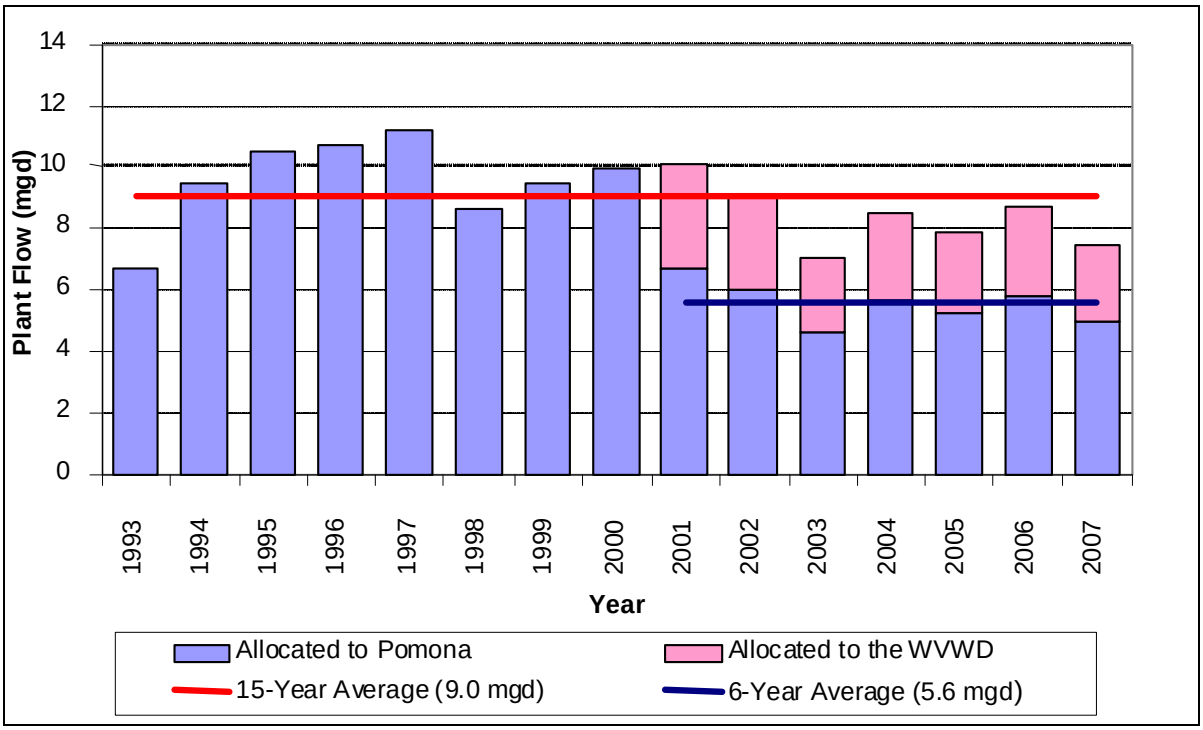

Figure 4.3 Pomona Water Reclamation Plant - Average Effluent Flow

Table 4.4 Water Quality Guidelines for Irrigation Use[1]
Recycled Water Master Plan
City of Pomona

Water Quality Parameter	Unit	Degree of Use Restriction[2,3,4] None	Degree of Use Restriction[2,3,4] Slight to Moderate	Degree of Use Restriction[2,3,4] Severe	Supply Source PWRP Effluent[5]	Supply Source Ground-Water[8]
Salinity EC_w	dS/m	<0.7	**0.7-3.0**	>3.0	**0.9**	**0.9**
TDS	mg/L	<450	**450-2000**	>2000	**540**	**514**
Permeability[6]			EC_w = 0.9			
SAR = 0-3 and EC_w =		>0.7	0.7-0.2	<0.2		
SAR[7,8] = 3-6 and EC_w =		>1.2	**1.2-0.3**	<0.3	**0.9**	**0.9**
SAR = 6-12 and EC_w =		>1.9	1.9-0.5	<0.5		
SAR = 12-20 and EC_w =		>2.9	2.9-1.3	<1.3		
SAR = 20-40 and EC_w =		>5.0	5.0-2.9	<2.9		
Sodium (Na)						
Surface	SAR	<3	**3-9**	>9	**3.5**[7]	1.5[7]
Sprinkler	mg/L	<70	**>70**		**100**	35
Chloride (Cl)						
Surface	mg/L	<140	**140-355**	>355	**155**	53.5
Sprinkler	mg/L	<100	**>100**		**155**	53.5
Boron (B)	mg/L	<0.7	**0.7-3.0**	>3.0	**0.67**	N/A
Bicarbonate	mg/L	<90	**90-500**	>500	**171**	**258**
pH	---	6.5-8.4 (normal range)			7.4	7.5
Nitrogen (N)						
Ammonia (NH_4)	mg/L	(see combined N values below)			1.2	N/A
Nitrate (NO_3)	mg/L	(see combined N values below)			4.4	14
Combined Nitrogen (N)	mg/L	<5	**5-30**	>30	**7.4**	N/A

Notes:

(1) Adapted from University of California Committee of Consultants (1974), and Ayers and Westcot (1994).

(2) Method and Timing of Irrigation: Assumes normal surface and sprinkler irrigation methods are used. Water is applied as needed, and the plants utilize a considerable portion of the available stored soil water (50% or more) before the next irrigation. At least 15 percent of the applied water percolates below the root zone (leaching fraction [LF] > 15%).

(3) Site Conditions: Assumes soil texture ranges from sandy loam to clay with good internal drainage with no uncontrolled shallow water table present.

(4) Definitions of "The Degree of Use Restriction" terms:

None = Recycled water can be used similar to the best available irrigation water.

Slight = Some additional management will be required above that with the best available irrigation water in terms of leaching salts from the root zone and/or choice of plants.

Moderate = Increased level of management required and choice of plants limited to those which are tolerant of the specific parameters.

Severe = Typically cannot be used due to limitations imposed by the specific parameters.

(5) Average PWRP effluent value, 2005-2007. Source: 2005-2007 Annual PWRP Reports.

(6) Permeability is evaluated based on the combination of adjusted sodium adsorption ratio (SAR) and Electrical Conductivity (EC) values.

(7) Adjusted SAR (adj. R_{Na}) includes the effect of bicarbonate/calcium ratio (Ca_x).

(8) Average Data from Wells 19 and 33. Source: City of Pomona well data 1995-2003.

4.3.1.4 Summary

Existing supplies could provide a total recycled water production of about 7.2 mgd. The breakdown of the supply capacities, along with the location of the sources are related issues, are summarized in Table 4.5.

Table 4.5 Existing Recycled Water Supply Sources
Recycled Water Master Plan
City of Pomona

Supply Source	Location	Issues	Supply (mgd)
Pomona WRP	295 S. Humane Way	Flow varies based on Plant operations	6.0 (1)
Well 19 (2)	131 N. Bellevue Ave.	Water quality unknown (3)	0.8
Well 31 (2)	302 Short St.	Water quality unknown (3)	0.2
Well 33 (4)	San Bernardino Ave. and Gibbs St.	Water quality unknown (3)	0.2
		Total	**7.2**

Notes:
(1) Assumes that future influent flows will be greater, thereby allowing the plant to slightly increase the amount of sewage that is treated on a daily basis. Currently the average portion allocated to the City is two-thirds of 8.4 mgd (5.6 mgd).
(2) Wells currently in operation.
(3) Well water quality data has not been taken in several years.
(4) Well not in use.

4.3.2 Future Supply Sources

The existing supply sources with a combined capacity of 7.2 mgd are sufficient to satisfy all the existing recycled water demands under ADD and MDD conditions. However, the existing supplies are not sufficient to serve all the potential customers identified in Chapter 3. A comparison of the existing recycled water supplies and potential recycled water demands is presented in Table 4.6.

Table 4.6 Recycled Water Supply and Demand Comparison
Recycled Water Master Plan
City of Pomona

	Existing Customers		Potential Future Customers	
Description	ADD (1) (mgd)	MDD (2) (mgd)	ADD (3) (mgd)	MDD (2) (mgd)
Demand	1.96	4.2	5.49	11.56
Existing Supply Capacity	7.2	7.2	7.2	7.2
Supply Surplus/(Shortfall)	**5.24**	**3.00**	**1.71**	**(4.36)**

Notes:
(1) Based on existing demand from Table 3.7 of Chapter 3. Summarized in Appendix D.
(2) Based on MDD/ADD peaking factor of 2.15 from Table 3.4
(3) Potential future demand (6,150 ac-ft/yr) from Table 3.7.

As shown in Table 4.6, the existing supplies are sufficient to meet the City's potential ADD, including the demands of Cal Poly Pomona and Forest Lawn Cemetery, which are large customers that are located outside the City boundary. However, the peak summer demands that are projected to be 2.15 times higher than ADD cannot be met with the current recycled water supplies.

The City could address this supply shortfall with the following six approaches:

1. Supplement the supply shortfall during the summer months with potable water.
2. Prioritize the potential customers and only expand the system such that the future MDD does not exceed the available supplies.
3. Work with the SDLAC to look for opportunities to increase the supply from the PWRP.
4. Rehabilitate existing non-potable wells that are currently out of service.
5. Look for new supply sources, such as the Inland Empire Utilities Agency (IEUA).
6. Use a combination of the options above.

These options are discussed in more detail below.

4.3.2.1 Supplement with Potable Water

The City could supplement the supply deficit during the high demand periods with potable make-up water, as it has done in the past when the two paper mills in the City were still operating and contributed to a substantially higher recycled water demand.

This approach would allow the City to maximize its allocated flow from the PWRP during the entire year. Because recycled water is currently sold for 70 percent of the potable water cost, the use of potable make-up water is not attractive from a cash flow perspective. The graph in Figure 4.4 presents the projected seasonal recycled water demand variation if all potential customers identified in Chapter 3 were connected to the recycled water system. This figure also shows the existing recycled water supply from the PWRP and the non-potable wells combined. The supply deficit is shown in yellow and equates to approximately 983 ac-ft/yr.

If this recycled water deficit were met with potable make-up water, the City would be selling potable water at the same price as recycled water, $1.20 per hundred cubic feet (HCF), rather than at the second tier potable water rate of $1.71/HCF, which is the tier that is charged to potential recycled water customers that are now on potable water since these customers are outside of the single-family residential category. Hence, the City would incur a loss of $0.51/HCF or $222/ac-ft, which equals a loss in revenue of about $222,000 per year for a supply deficit of 983 ac-ft/yr ($222/ac-ft times 983 ac-ft/yr).

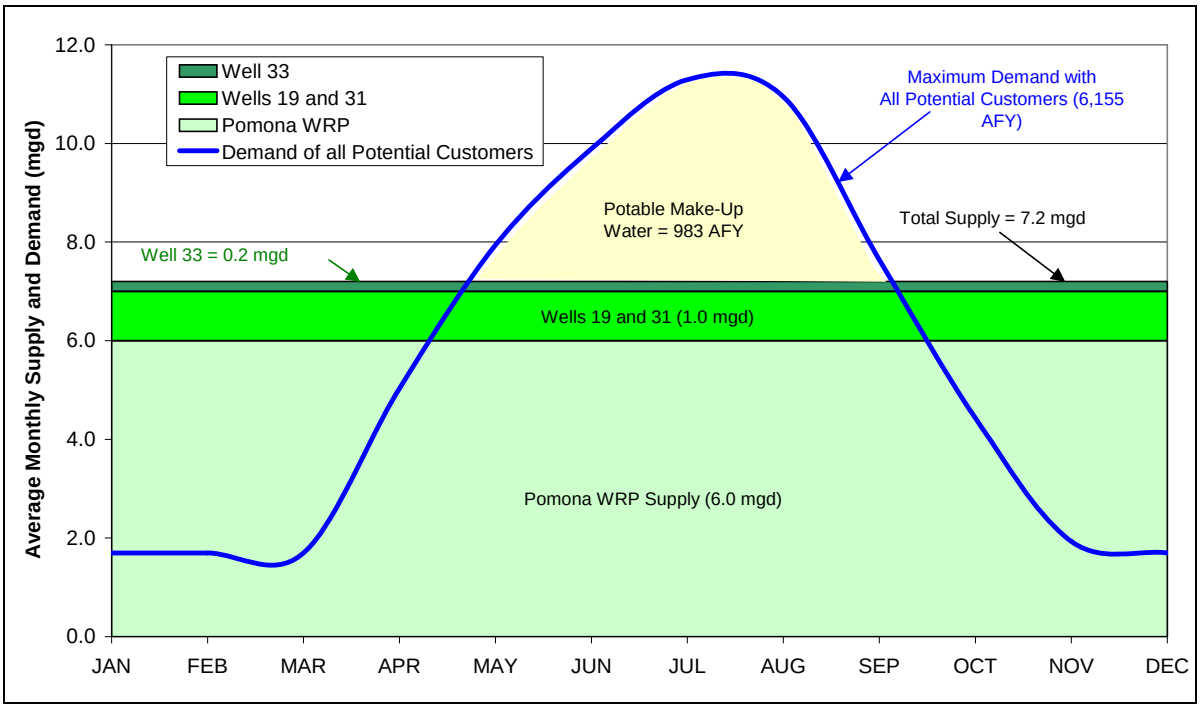

Figure 4.4 Estimated Potable Water Make-Up Requirement

Savings associated with reduced imported potable water purchases during the winter periods can easily offset this potable water make-up cost. When the recycled water system is only sized to meet MDD with the available supplies, the City would not fully maximize its allocation from the PWRP during the low demand periods. The graph in Figure 4.5 shows the projected seasonal recycled water demand variation if the City's MDD is limited to 7.0 mgd, which is the available supply from the PWRP, Well 19, and Well 31. Well 33 and the four non-potable (Simpson) wells are not considered in this option, as pipeline expansions to connect these wells would be cost-prohibitive if only a few new customers could be connected.

The area shaded in blue in Figure 4.5 shows the amount of recycled water available from the PWRP that the City cannot use due to limited existing customer demand. This amount equates to estimated at 1,244 ac-ft/yr. Using a potable water supply cost of $800/ac-ft (the cost of imported water from Metropolitan Water District projected for September 2009) and a recycled water cost of $110/ac-ft (cost of purchasing recycled water from SDLAC), the City could potentially save $690/ac-ft or $859,000 per year on imported water cost by maximizing its recycled water system. Deducting the lost revenue due to selling potable make-up water at the recycled water rate ($220,000 per year), this approach would still result in a positive balance of $639,000 per year. It should be noted that this cost estimate only considers capital cost and does not include potential differences in O&M cost, such as energy cost for pumping.

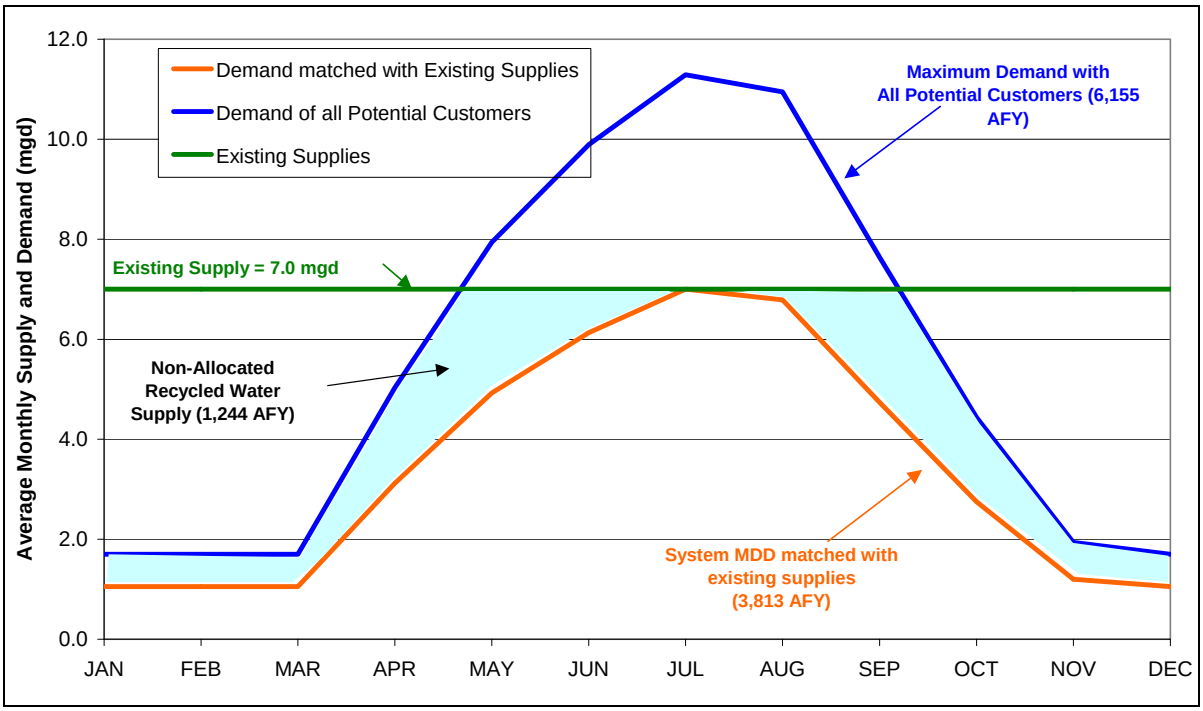

Figure 4.5 Estimated Amount of Non-Allocated Recycled Water Supply

This discussion shows that it is advantageous for the City to maximize the use of the available recycled water supplies. This should be a serious consideration due to the substantial potable water cost increases that are projected during the next few years. The cost of treated imported water in southern California is anticipated to exceed $1,000 per acre-foot in year 2011 or 2012. Table 4.7 summarizes the cost savings.

Table 4.7 Cost Benefit for Maximizing Use of Recycled Water beyond MDD
Recycled Water Master Plan
City of Pomona

Description	Volume (ac-ft)	Cost/ Revenue	Total
Potable Make up Water	983	($222) (1)(2)	($220,000)
Additional Recycled Water Supplied	1,244	$690 (3)	$830,000
Grand Total (Revenue Surplus)			**$639,000**

Notes:

(1) Price of potable $744/ac-ft ($1.71 HCF) minus the price paid for recycled water $522/ac-ft ($1.20/HCF)

(2) The customer is only paying for the price of recycled even though potable is supplied.

(3) Price of MWD water, $800/ac-ft minus the price the City pays SDLAC for recycled water, $110/ac-ft.

It should be noted that the calculation shown in Table 4.7 does not include the cost of expansion the City's recycled water system with additional pipelines, pump stations, and reservoirs. This feasibility of system expansions is discussed in detail in Chapter 8 of this Recycled Water Master Plan (RWMP).

4.3.2.2 Prioritize Potential Customers

As the potential demand exceeds the available supply, the City should prioritize additional proposed customers based on expansion cost and added demand. The unit cost of building the required infrastructure to reach a new customer, expressed in capital dollars per acre-foot of demand served, is a good basis for prioritizing system expansions. Typically, large customers are more cost-effective to add than small customers are, unless the distance to a customer location makes it cost-prohibitive. The very large customers often function as the anchors of a recycled water system and are connected first. Smaller customers that are located along the route of the pipelines are typically added to the system later. These smaller customers are often referred to as "pick-up" customers.

Another factor that needs to be considered when prioritizing customers is their proposed usage pattern. Non-irrigation customers such as cooling towers, power plants, and refineries, provide a good baseload demand that can take supplies during the day when wastewater flows are much higher. This reduces the amount of storage needed to buffer the difference between the diurnal supply and demand curves. The baseload customers also improve the overall system hydraulics and can reduce surge and large pressure fluctuations, especially in closed distribution systems.

The prioritization of potential system expansions is discussed in detail in Chapter 8. The system is divided into several pipeline segments that each serve a group of customers and require a number of infrastructure improvements, such as pipelines, pump stations and reservoirs. The unit cost of each expansion segment is calculated and along with other considerations, these segments are ranked and used to develop a recommended system.

4.3.2.3 Increase Capacity of PWRP

As part of this project, meetings were held with SDLAC staff to explore the opportunities to obtain more recycled water from the PWRP. Correspondence regarding these discussions may be found in Appendix E. During these discussions, it was mentioned that the PWRP capacity could be increased by process additions, such as equalization basins. It was estimated that the installation of these basins could potentially increase the plant capacity from 9 mgd to 11.5 mgd (Pomona, 2008a). This would increase the daily average flow by approximately 2.5 mgd, thus providing the City with an additional 1.6 mgd of supply (two-thirds allocation). However, it was also discussed that the SDLAC's current master plan does not include any projects or goals to increase the capacity of the PWRP. It is therefore assumed in this RWMP that the supply capacity from the PWRP remains unchanged.

4.3.2.4 Rehabilitate Non-Potable Wells

The City could rehabilitate the abandoned non-potable wells of the former Simpson Paper Company, located in the northeast area of the City as shown on Figure 2.1. If included in the supply, the wells would contribute an additional 2.3 mgd. However, these wells are old and are in need of significant repair or possible replacement. The water quality of the wells is questionable, as measurements have not been taken in years. Due to these uncertainties, these wells are not considered as a potential future supply source within the planning horizon of this RWMP.

4.3.2.5 Inland Empire Utilities Agency (IEUA)

The City could potentially obtain recycled water from the IEUA, which is the regional recycled water provider for a number of cities located east of the City. Although the City is not a member agency, it is located adjacent to IEUA's service area and the City boundary is relatively close to one of IEUA's new transmission mains, the San Antonio Channel Pipeline. This pipeline conveys recycled water from Regional Plant No. 1 (RP-1) in a westerly direction to the San Antonio Spreading Basins and IEUA is in the process of expanding its recycled water system. The San Antonio pipeline terminates about two to three miles outside of the Pomona city limit. A pipeline expansion could bring recycled water the City's boundary near Lincoln Street.

The City met with the IEUA on October 16, 2008 to discuss the possibility of the IEUA supplying Pomona with recycled water. During the meeting, the IEUA elaborated on the details of the newly constructed San Antonio Channel Pipeline, the pipeline that would potentially supply the City with recycled water. Spare capacity in the pipeline was discussed, and the IEUA supplied rough approximations of potential off peak flows that could potentially be delivered to the City on a yearly basis. The meeting ended with the IEUA concluding that too many unknowns existed for the agency to commit to any preliminary delivery flows at that time. Subsequently, it was decided more evaluation and additional meetings and correspondence would be required. Finally, in July 2009, the IEUA confirmed that it would not supply the City with recycled water. See Appendix E for a copy of the letter submitted to the City that states recycled water will not be supplied to the City by the IEUA.

4.3.3 Supply Reliability

For both existing and future supply sources, supply reliability must be considered when adding new customers to the recycled water system. Due to the periodic maintenance and water quality issues that occur at many treatment plants, recycled water from any treatment plant should not be treated as a 100 percent reliable source. In addition, plant flow may fluctuate from year to year. As shown in Figure 4.3, the amount of effluent supplied by the PWRP may vary by as much as 20 percent on a year-by-year basis. Consequently, all recycled water customers must have a backup potable water connection.

4.3.4 Summary

If the existing and future supplies are totaled, the City's recycled water supply could potentially increase from 7.0 mgd to 12.4 mgd. Potential future supplies are uncertain to be developed within the planning horizon of this master plan (2030) due to various issues. The breakdown of the capacities and description of the related issues are summarized in Table 4.8.

Table 4.8 Recycled Water Supply Sources City of Pomona
Recycled Water Master Plan
City of Pomona

Supply Source	Existing Source?	Location	Issues	Supply (mgd)
Pomona WRP	Yes	295 S. Humane Way	• Flow varies based on Plant operations	6.0(1)
Well 19(4)	Yes	131 N. Bellevue Ave.	• Water quality unknown(2)	0.8
Well 31(4)	Yes	302 Short St.	• Water quality unknown(2)	0.2
Existing Supply Capacity				**7.0**
Well 33(3)	Yes	San Bernardino Ave. and Gibbs St.	• Well needs to be connected • Water quality unknown(2)	0.2
Simpson Wells (4)	No	Various locations in northeastern part of the City (see Figure 2.1)	• Significant repairs needed Potential water quality issues • Requires pipelines to connect to the City's RW system	2.3
Existing Supply Capacity plus City Wells				**9.5**
IEUA	No	Lincoln Ave.	• Requires agreement with IEUA • Requires a 2 to 3 mile pipe to City boundary	1.3(3)
Pomona WRP Expansion	No	295 S. Humane Way	• Dependent upon SDLAC expansion plans	1.6(4)
Potential Supply Capacity with all Sources				**12.4**

Notes:

(1) Assumes that future influent flows will be greater, thereby allowing the plant to slightly increase the amount of sewage that is treated on a daily basis. Currently the average portion allocated to the City is two-thirds of 8.4 mgd (5.6 mgd).

(2) Well water quality data has not be taken in several years.

(3) Based on a flat delivery from IEUA of 1,500 ac-ft/yr or 1.3 mgd. However, IEUA has informed the City that it will not provide recycled water within the planning horizon of RWMP (Pomona, 2009c)

(4) Based on 2.5 mgd capacity increase due to installation of equalization basins and a 2/3 allocation for the City.

PLANNING AND EVALUATION CRITERIA

5.1 INTRODUCTION

This chapter presents the planning and evaluation criteria that are used in subsequent chapters for both identifying deficiencies in the existing system and sizing possible expansions. Hydraulic planning criteria and assumptions discussed in this chapter include system pressures and sizing criteria for pipelines, storage reservoirs, and booster pumping stations.

5.2 SYSTEM PRESSURES

The recycled water system pressure is ideally designed to be slightly lower than the potable water system pressure. This pressure differential reduces the risk of potable water contamination from recycled water, in the event that an adjacent recycled water main breaks. However, this requirement often cannot be met due to the following two reasons:

1. System pressures in potable water systems vary and pressure zone boundaries of potable and recycled water systems typically do not overlap.
2. It is preferred to maintain a minimum pressure in the recycled water system of approximately 60 pounds per square inch (psi) to meet the operating requirements for most sprinkler systems. However, the minimum pressure in potable water systems is typically 40 psi.

As the chance of cross contamination is minimal due to disinfection and a minimum horizontal separation of 10 feet between potable and recycled water pipelines, it is assumed that the layout of the recycled water system expansions does not need to be coordinated with the existing potable water system pressure ranges.

The minimum system pressure used for pipeline sizing in this master plan is 40 psi under peak hour demand (PHD) conditions. The maximum system pressure is 110 psi under minimum day demand (MinDD) conditions, to avoid the need for more costly high-pressure class pipelines.

5.3 PIPELINE SIZING CRITERIA

Pipelines sizing is based on several factors including:

- Demand conditions
- Pipeline velocity
- Pipeline headloss

Pipelines are selected so that they do not exceed velocity and headloss criteria under PHD conditions. When a pipeline exceeds the velocity or headloss criteria during PHD, it is upsized to the next standard size (see Section 5.3.3). Velocity and headloss criteria are discussed below.

5.3.1 Pipelines Velocities

The maximum pipe velocity should not exceed 6 feet per second (ft/s) under PHD conditions in the transmission mains, which are defined as all pipelines greater than 12 inches in diameter. The maximum pipeline velocity in distribution mains, which are defined as all pipelines of 10 inches in diameter and smaller, should not exceed 4 ft/s under PHD conditions.

5.3.2 Pipeline Headloss

The maximum headloss should not exceed 5 feet per thousand feet (ft/kft) under PHD conditions with the entire distribution network in service.

5.3.3 Typical Pipeline Diameter

Any pipeline greater than 12 inches in diameter and larger is typically considered to be a transmission pipeline, while pipelines that are 10 inches in diameter and smaller are considered to be distribution pipelines.

The minimum pipeline size of new distribution pipelines, excluding service laterals, is 6 inches in diameter. The standard sizes used for pipelines greater than 6 inches in diameter are 8-inch, 12-inch, 16-inch, 20-inch, 24-inch, 30-inch, and 36-inch diameter pipelines.

5.4 STORAGE SIZING CRITERIA

To operate a recycled water system with reservoirs that are supplied from the Pomona Water Reclamation Plant (PWRP), two types of storage are required. These are:

1. Operational Storage. The storage required to buffer demand fluctuations under maximum day demand (MDD) conditions, including the difference between PHD and the supply flow from the PWRP. The volume required for this storage component is highly dependent upon the hourly variation of the customer's demand and the variation of flow from the PWRP.
2. Emergency Storage. The storage volume required protecting reservoirs from complete drainage. This "dead" storage provides operational flexibility.

The first storage component, operational storage, is calculated based on the estimated water demand of the potential customers and their associated diurnal patterns. Based on the assumption that the majority of customers (irrigation users) will only use recycled water in a 12-hour demand period, it can be calculated that the operational storage need to be sized for 55 percent of the maximum monthly demand (MMD) of each pressure zone. The basis of this calculation is shown below in Figure 5.1.

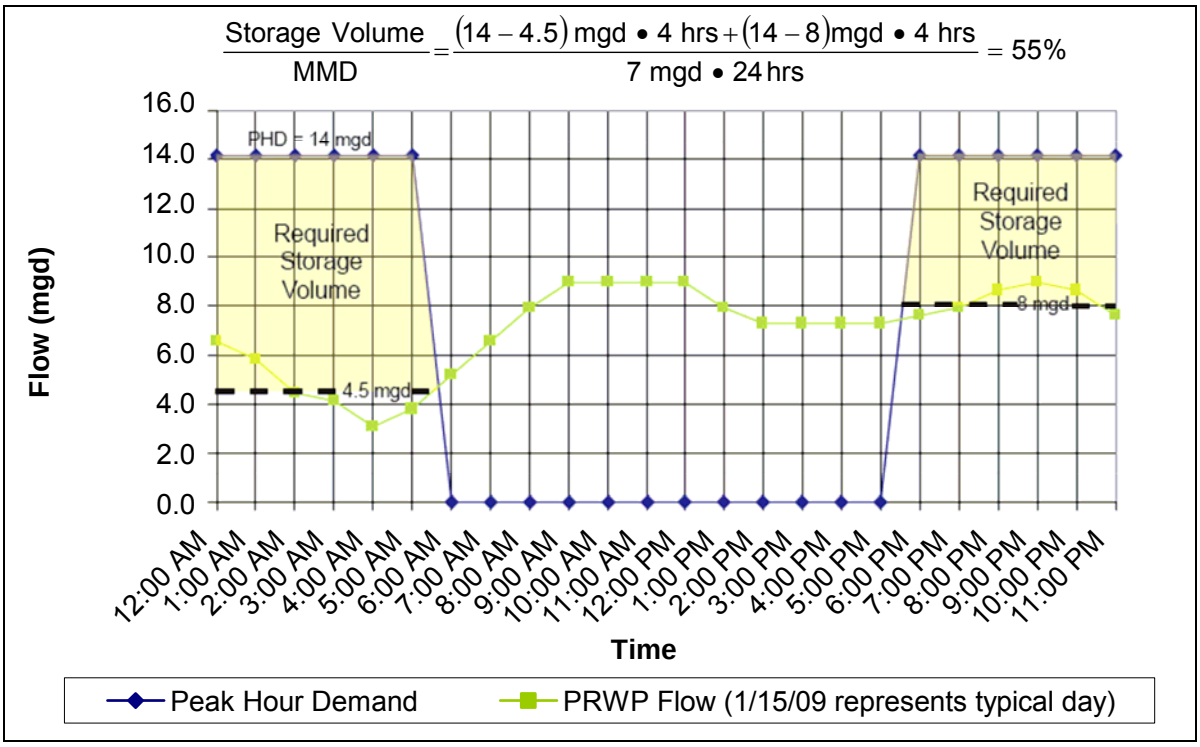

Figure 5.1 Operational Storage Relative to Maximum Day Demand

The second storage component, emergency storage, is required for operational storage. The capacity of all reservoirs should include an additional 10 percent to buffer any emergency needs due to operational issues, such as a temporary shutdown of the PWRP.

The total required storage requirement is therefore determined as 65 percent of the MMD.

5.5 PUMP STATION SIZING CRITERIA

Two different pump station (PS) sizing criteria were used for the system analysis in this Recycled Water Master Plan (RWMP). The criterion that should be applied for the sizing of a PS is dependent upon the location of reservoir storage in the zone that the PS pumps into. The two criteria are:

1. Pressure zones with gravity reservoir storage. These zones have the benefit that reservoirs provide additional supply during the peak hours of MDD (reservoir drainage) and provide buffer capacity during the minimum hours of MDD (reservoir filling). This allows pump station sizing for the average hour demand of MDD. Hence, all pump stations that pump into a zone with gravity storage are sized for MDD.
2. Pressure zones without gravity reservoir storage. These zones do not provide the benefit of additional supply from reservoirs during the peak hours of MDD. Hence, all pump stations that pump into a zone without gravity storage (closed system) need to be sized for PHD.

The total pumping capacity of a PS needs to be sufficient to serve the required demand with the largest pump unit out of service, so that one pump unit can be designated as a spare to accommodate repairs and maintenance activities without interruption of system operations.

It is assumed that booster stations do not require backup pumping capacity for emergencies, as irrigation water supply could temporary be interrupted and the existing customers could fall back on their potable water connection if needed.

5.6 SUMMARY PLANNING AND EVALUATION CRITERIA

Table 5.1 summarizes evaluation criteria described in this chapter.

Table 5.1 System Evaluation Criteria
Recycled Water Master Plan
City of Pomona

Parameter	Evaluation Criteria		Demand Condition
System Pressure			
Minimum System Pressure	40	psi	Peak Hour Demand
Maximum System Pressure	110	psi	Minimum Hour Demand
Pipeline Velocity			
Max. Velocity (Diameter ≤ 12-inch)	4	ft/s	Peak Hour Demand
Max. Velocity (Diameter > 12-inch)	6	ft/s	Peak Hour Demand
Fraction Factor (Hazen-Williams)	120		All conditions
Storage Volume			
Operational Storage	55% of MMD(1)		Maximum Month Demand
Emergency Storage	10% of MMD		Maximum Month Demand
Total Storage	65% of MMD		Maximum Month Demand
Pump Station Capacity			
For Zones with Gravity Storage	Meet MMD with largest pump unit out of service (OOS)		Maximum Month Demand
For Zones without Gravity Storage	Meet PHD with largest pump unit OOS		Peak Hour Demand
Backup Power	Not Needed		N/A

Notes:
(1) Storage is sized to account for fluctuations in the Pomona Water Reclamation Plant diurnal flow.

Chapter 6

HYDRAULIC MODEL DEVELOPMENT

This chapter summarizes the activities that were undertaken to develop and calibrate a hydraulic model that was used during this master plan to identify and evaluate capital improvements for the City of Pomona (City) recycled water distribution system. This chapter contains the following sections:

- Hydraulic Modeling Overview. This section explains the purpose of hydraulic models and the major components that are required when undertaking a hydraulic modeling program.
- Hydraulic Model Selection. This section contains a brief overview of the software chosen for the hydraulic model, and the reasons for selecting the software.
- Model Development. This section describes the data and procedures used to create the model.
- Model Calibration. This section describes the procedures used to gather field data and calibrate the model in order to establish a level of confidence in the model results.

6.1 HYDRAULIC MODELING OVERVIEW

Rapid innovations in personal computing and the large selection of software have made network analysis modeling efficient and practical for virtually any water system. Modeling is an important tool for analyzing a water system. Modeling can simulate existing and future water systems, identify system deficiencies, analyze impacts from increased demands, and evaluate the effectiveness of proposed system improvements, including those within capital improvement plans. In addition, the hydraulic model provides both the engineer and water system operator with a better understanding of the water system. A hydraulic model is composed of three main parts:

- The data file that stores the geographic location of facilities. The geographic data file provides water system facility locations and is typically represented as an AutoCAD or geographic information systems (GIS) file. Elements used in this file to model system facilities include pipes, junction nodes (connection points for pipes and location of demands), control valves, pumps, tanks, and reservoirs.
- A database that defines the physical system. The database for the City of Pomona model is linked to the geographic data file. The database includes water system facility information such as facility size and geometry, operational characteristics, and production/consumption data.

- A computer program “calculator”. This calculator solves a series of hydraulic equations based on information in the database file to define and generate the performance of the water system in terms of pressure, flow and operation status.

The key to maximizing benefits from the hydraulic model is correctly interpreting the results so the user understands how the water distribution system is affected by the various components of the model. This understanding enables the engineer to be proactive in developing solutions to existing and future water system goals and objectives. With this approach, the hydraulic model is not only used to identify the adequacy of system performance, but is also used to find solutions for operating the water system according to established performance criteria.

Developing an accurate and reliable computer model begins with entering the best available information into the database and calibrating the model to match existing conditions in the field. Once the model has been calibrated, it becomes an invaluable tool to solve planning and operational problems.

6.2 HYDRAULIC MODEL SELECTION

Several software programs are widely used to model distribution systems. The variety of program capabilities and features makes the selection of a particular software program generally dependent upon three factors: user preference, the requirements of the particular water distribution system, and the cost associated with the software.

Although multiple software packages are available, $H_2OMAP^{®}$ Water, developed by MWH Soft, Inc., best meets Pomona’s modeling requirements because it contains a number of features that promote modeler efficiency, such as:

- A graphical user interface that allows the user to visualize the water system, edit data, and obtain results
- Seamless integration with the City’s GIS data
- Fast processing speed
- Data management tools
- An intuitive user interface
- Complete hydraulic calculation capabilities

6.3 MODEL DEVELOPMENT

The City provided the information needed to develop the model. After reviewing the information provided by City staff, the hydraulic model was developed by representing each system component with the correct corresponding model component. Either a model link or a model node is used to represent each system component. Associated physical and operational data for each component is stored as an attribute table assigned to each link or node. Creating a model involves the following steps:

1. Node Creation. Nodes are created for the appropriate corresponding components of the City's recycled water system.
2. Link Creation. Links are created between the appropriate nodes as required by the physical setup of the City's recycled water system.
3. Attribute Data Input. Unique attribute data is assigned to each link and node.
4. Operational Data. Based on an assumed operating philosophy, control parameters are assigned to the appropriate links and nodes.

The model operates according to the operational and physical attributes assigned to each node and link. This information is used to simulate flows and pressures within the system as predicted by the model's mathematical equations. A screenshot of the model is shown in Figure 6.1.

6.3.1 Link and Node Creation

As mentioned, links and nodes are the model representations of physical system components. Links are used to represent pipes, pumps, and control valves. Pipe segments represent the actual transmission or distribution water pipelines. In the attribute table for each pipe, data typically includes diameter, length, C-factor, and pressure zone. The model calculator uses the attribute data to determine increases or decreases in energy levels across the link. Flows, velocities, headloss, and changes in hydraulic grade line are some of the reported output data for all links.

Nodes represent the connections between links and may act as either a supply source, such as a reservoir, or a customer demand. Nodes also define the boundaries of each link and separate links that may contain different attributes. Each node also has an elevation that fixes the elevations of the connecting link elements. Attribute data associated with each node typically includes elevation, water demand, and pressure zone. The model calculates system pressures, hydraulic grade lines, demands, and water quality parameters at each node.

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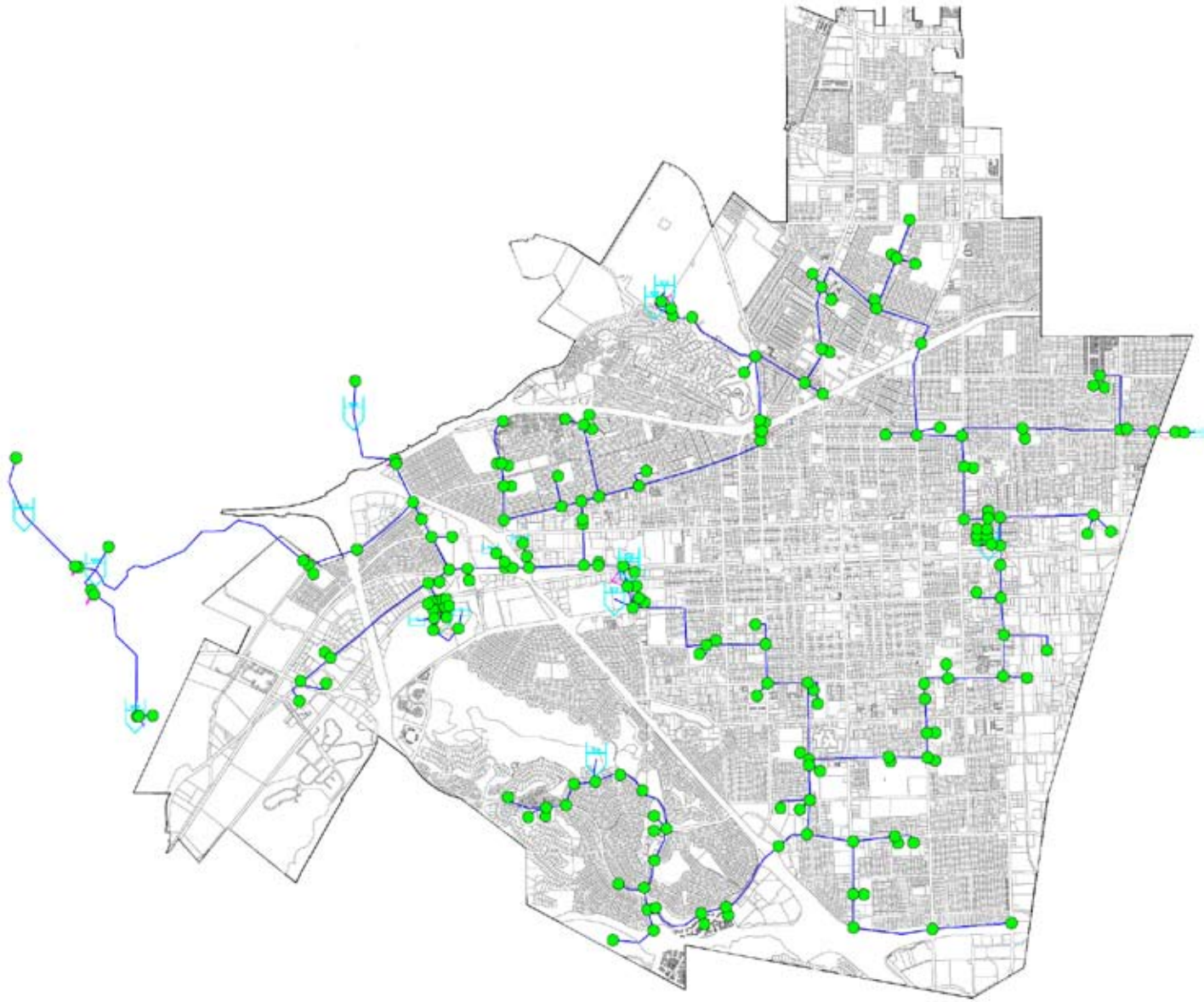


FIGURE 6.1

HYDRAULIC MODEL

6.3.2 Attribute Data Input

Once the nodes and links are created, attribute data is assigned. The following sections describe the sources of the attribute data for the model elements representing each unique component of the City's recycled water system.

6.3.2.1 Pipes

All pipes are modeled as link elements in the model. Attribute information required for each pipe includes location, length, diameter, material, installation year, and connectivity.

Pipe data for the City's hydraulic model was extracted from the City's as-built plans. An estimate of pipe roughness or friction factor was derived from parameters such as material, age, and diameter. The roughness coefficients in the hydraulic model were estimated for various pipeline materials and range from 110 to 125. A value of 114 was used for the existing CML&C steel pipes of the existing system. A higher value of 120 was used for new DIP.

6.3.2.2 Groundwater Wells

Groundwater wells are modeled with a reservoir node and a pump link. The reservoir water level is set at the groundwater elevation and the pump station is assigned a pump curve.

Historical groundwater production records and testing records for the well pumps were used to input the necessary information for the reservoir node, which is used in the model to represent the groundwater aquifer. The pump test points were used to input the well pump operations by creating hydraulic performance curve for the pump element.

6.3.2.3 Reservoirs

Each reservoir is modeled as a node. The reservoir information needed for the hydraulic model includes base elevation, overflow elevation, diameter, and height.

Data for the reservoirs was gathered from the City's as-built plans.

6.3.2.4 Booster Pump Stations

Booster pump stations (PS) are modeled as pump link elements. Each pump begins and ends at a node. Data needed for the individual booster pumps includes hydraulic performance curves and control algorithms.

Physical locations, dimensions, and horsepower were obtained from the City's as-built plans. Hydraulic performance curves and control strategies were estimated from data readings recorded by the City's Supervisory Control and Data Acquisition (SCADA) system.

6.3.2.5 Pipe Junctions

Nodes are used to represent both the junction between two or more adjoining pipes and the end of each dead-end pipe. Ground elevations are required for each junction.

These elevations were extracted from the topographic GIS shapefile based on information from the United States Geological Survey (USGS). The H_2OMAP Water® modeling software automatically assigned an elevation to each junction by linearly interpolating between contours in the GIS shape file.

6.3.2.6 Customer Demands

Although nodes exist whenever a link element is present, certain nodes are selected to represent customer demands. During model development, certain nodes are inserted into a link element in order to create a customer demand. At the node, a customer demand value is assigned along with a diurnal curve.

Demand values and diurnal curves were assigned based on the analysis presented in Chapter 3.

6.3.2.7 Treatment Plant Supply

The Pomona Water Reclamation Plant (PWRP) supplies the City's recycled water system. Plant flow is modeled as a reservoir with a flow control valve (FCV). The FCV is set to mimic the diurnal flow from the plant. Downstream of the flow control valve is a reservoir, which is connected to the booster pump station. This downstream reservoir models the bays that feed the booster station at the plant.

Physical dimensions of the feed bays and the diurnal flow from the plant were based on the information presented in Chapter 4.

6.3.3 Operational Controls

Once all elements of the distribution system are modeled as nodes and links, the operational controls can be input in the model. These controls are used to make the nodes and links interact in a way that mimics the real water distribution system operations.

According to discussions with City staff, the recycled water system is level controlled. The booster pump stations are controlled by the level in the upstream system reservoirs and the level in the downstream effluent storage bays at the plant. The following control rules are followed in the model:

- The pumps at the booster station are activated progressively. As the level in the upstream reservoirs decreases, more pumps are brought online to satisfy system demands.

- The small booster pumps are progressively activated. Once all small booster pumps are online, the large booster pumps begin to activate as necessary. The City has three small 60-horsepower (hp) booster pumps and two large 125-hp booster pumps.
- The pumps deactivate progressively as the level in the upstream reservoirs increases.
- The pumps deactivate when the level of the downstream bays feeding the pump station is at the low level setpoint. The pumps are only allowed to reactivate once the level in the bays increases to a safe level.

Preliminary level setpoints were entered for the activation and deactivation of each booster pump. The actual levels setpoints that allow the model to mimic actual system operating performance were determined during the calibration phase.

6.4 MODEL CALIBRATION

Once the model was developed, the model was calibrated so that it provided a reasonable representation of actual field performance. Figure 6.2 shows the infrastructure that is represented in the hydraulic model. During calibration, parameters in the computer model are adjusted so hydraulic results are similar to observed measurements in the field under identical conditions. Once calibrated, the model is an effective tool for predicting system performance under different demand and other operational conditions.

The level of effort required to calibrate a model strongly depends upon the quality of data used to create the hydraulic model. Higher quality data requires fewer assumptions; consequently, the probability of the model results matching field measurements is higher. Low quality data requires more assumptions, thus decreasing the probability of the model results closely reflecting field conditions.

Some data issues that affect the confidence level of the City's hydraulic model include:

- Manufacturer Pump Curves. Manufacturer pump curves were not available for the booster pump station; therefore, the pump curves were approximated. This approximation used SCADA measurements and estimates for characteristics such as the shutoff head and the maximum flow.
- User Diurnal Patterns. Diurnal patterns were estimated based on the user type. Temporal variability of large user demands could cause substantial differences between the modeled demand peaks and the actual demand peaks.
- Customer Status. Only two of five existing customers were actively using recycled water during the calibration period. If different users were active during the calibration period, the operation conditions would be much different.

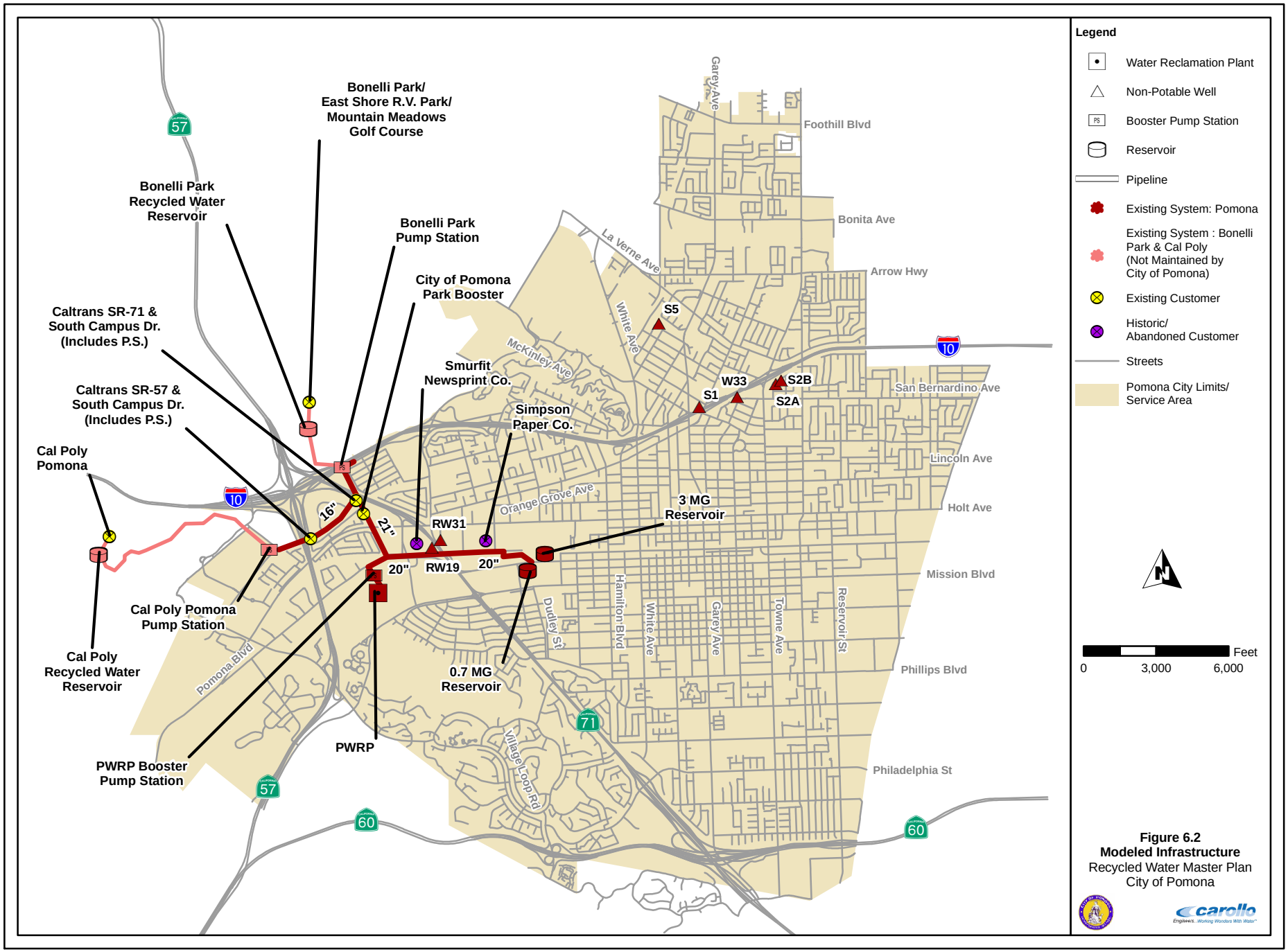


Figure 6.2
Modeled Infrastructure
Recycled Water Master Plan
City of Pomona

- Unknown Variables. Possible unknown variables could exist within the field, including, but not limited to, closed or broken valves, incorrectly documented pipe diameters, incorrect topology, or excessive corrosion in some pipelines.

The model calibration process consisted of the following steps: 1) debugging the model, 2) gathering field data, and 3) calibrating the model based on the field data.

6.4.1 Model Debugging

The newly created model is debugged as necessary to obtain reasonable system pressures and flow rates for both a steady state and an extended period simulation. During this macro-calibration stage the necessary modifications are made to pipeline connectivity and facility characteristics.

6.4.1.1 Pipeline Connectivity

Carollo uses the connectivity features of H_2OMAP Water® hydraulic modeling software to verify the connectivity of the transmission mains within the distribution system. Output reports of pipe flow characteristics, such as headloss (ft/kft) and velocity (ft/s) are also used to locate problem areas requiring possible connectivity adjustments.

6.4.1.2 Facility Characteristics

Hydraulic model results from each water system facility (pump station, storage tank, etc.) were examined to find deviations from Carollo's understanding of the existing system. This process typically includes conversations with field operating staff to create a model that produces results comparable to what the City experiences in the field. Possible adjustments include modifications to operational controls, ground elevations, pump curves, and other facility characteristics. For future system evaluations, additional pump station, storage, as well as pressure regulating stations, were modeled.

6.4.2 Field Data Gathering

After the model was debugged, results, while reasonable, might not accurately reflect actual conditions in the field. Field data is gathered so that model output, such as system pressures, flows, demands, and tank levels, can be compared to the actual field conditions. Based on this comparison, variables in the model's extended period simulation (EPS) are adjusted so that results closely match field conditions over a 24-hour period. During the field data-gathering task, pressure data, tank levels, and flows from wells, and booster station are recorded to observe diurnal patterns for the EPS calibration.

Data gathering for the field calibration took place between September 29 and October 20, 2008. During this time, SCADA measurements were recorded for pump station discharge flows, pump station discharge pressures, and reservoir levels. The time step for each SCADA measurement was 5 minutes. Customer meters were also recorded between

October 14 and 15, 2008, to measure the total demand for a 24-hour period. The customer meter read data is summarized in Table 6.1.

Table 6.1 Recycled Water Meter Readings for October 14-15
Recycled Water Master Plan
City of Pomona

Day / time		Cal Poly		Bonelli Park	
		Meter Read	Usage (gal)	Meter Read	Usage (gal)
14-Oct	8:00 a.m.	573983	0	827176	0
14-Oct	10:00 a.m.	573983	0	827507	331,000
14-Oct	12:00 p.m.	573983	0	827831	324,000
14-Oct	2:00 p.m.	573983	0	828095	264,000
14-Oct	4:00 p.m.	573983	0	828321	226,000
15-Oct	8:00 a.m.	575409	1,426,000	829460	1,139,000
Total 24-Hour Demand (gal)			**1,426,000**	**n/a**	**2,284,000**
Average Demand (gpm)			**990**	**n/a**	**1,586**

6.4.3 Extended Period Model Calibration

After the completion of the data gathering phase, the model was calibrated to match conditions between 8:00 a.m. on October 14th and 8:00 a.m. on October 15th. In other words, the model was calibrated to match one 24-hour period that started at 8:00 a.m. on October 14th. This date was selected because of the customer meter reads that were performed that day. A new model scenario was created for calibrating, and within the calibration scenario, several variables were adjusted so that the model output matched the data for the 24-hour period. These variables are discussed in the following sections.

6.4.3.1 Adjustment of Demands

Within the calibration scenario, the demands were set so that overall demand matched the recorded readings for the calibration period. The demands for the day were based on the customer meter readings. The only two active customers were California Polytechnical University of Pomona (Cal Poly), which had a demand of 990 gpm and Bonelli Park, which had a demand of 1,586 gpm. These demands were entered into the model. All other demands were set at zero. Diurnal curves for each customer were also added to the model. These curves were also based on the meter readings and the diurnal system demand for the day. Diurnal system demand was calculated as the sum of the flow from the pump station and the reservoirs as recorded by the SCADA system. The resulting model diurnal demand in comparison to the SCADA diurnal demand is shown below in Figure 6.3.

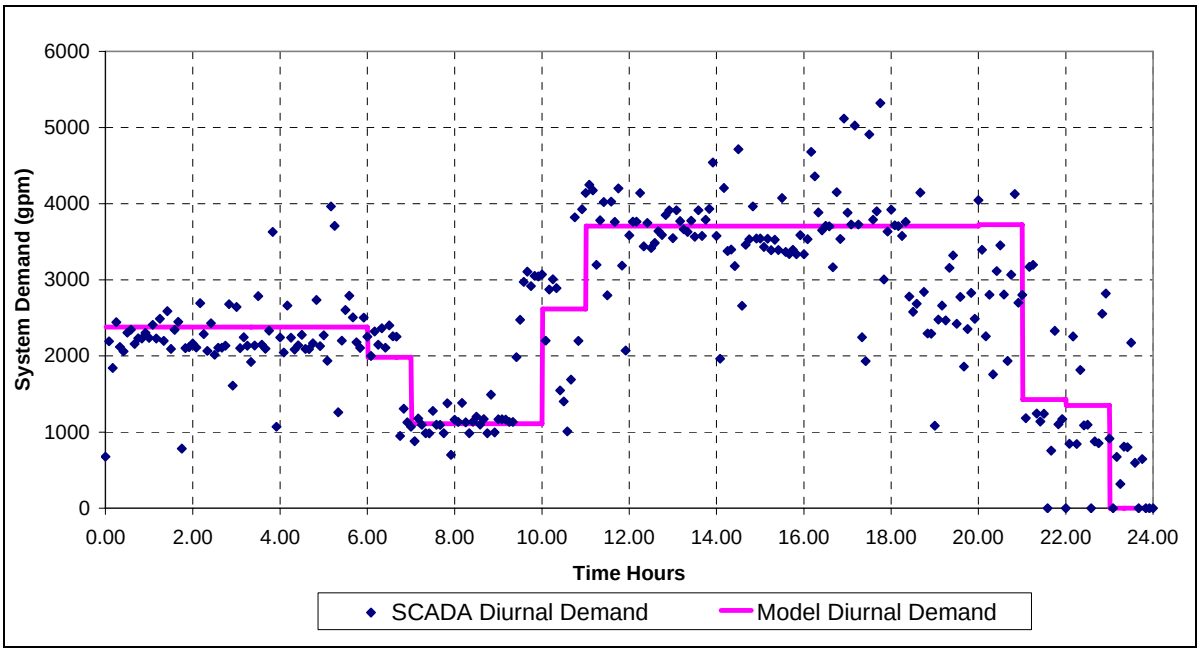


Figure 6.3 Model Results compared to SCADA Data for System Demand

As shown in Figure 6.3, the model diurnal demand shows the same general pattern as the diurnal demand calculated from the SCADA data. The SCADA demand varies widely due to both the normal cycling of customer demands and the lag times between the different discrete measurements used to calculate the demand. Based on the numbers presented in Appendix D, the measured demand indicates a demand higher than the estimated average day demand (ADD) condition but lower than the estimated maximum month demand (MMD) condition. Therefore, the calibration scenario is not the same as average or maximum day conditions.

6.4.3.2 Boundary Conditions

Boundary conditions include the initial operating status of each mechanical facility and the initial hydraulic levels. In the calibration scenario, initial tank levels were set to match reservoir levels at 8:00 a.m. on October 14, 2008. Also, the pumps were set to the initial operating status shown by the SCADA system.

6.4.3.3 Establish Controls

Specific control setpoints were estimated from the SCADA data and input into the model calibration scenario. The model is setup with a booster station that is level controlled by the upstream reservoirs and the downstream effluent bays. Based on the SCADA data, the model booster station was set to use the following control points listed in Table 6.2.

Table 6.2 Booster Station Control Points
Recycled Water Master Plan
City of Pomona

	Reservoir Level (feet) [1]		PWRP Effluent Bay Level (feet) [1][2]	
Pump Unit No.	**Switch - ON**	**Switch - OFF**	**Switch - OFF**	**Allow - ON [3]**
Small Booster 1	24.30	26.08	8.00	10.00
Small Booster 2	23.55	25.50	8.00	10.00
Small Booster 3	23.15	24.50	8.00	10.00
Small Booster 4	22.75	24.00	8.00	10.00
Large Booster 1	22.25	23.50	8.00	10.00
Large Booster 2	21.75	23.00	8.00	10.00

Notes:

(1) All elevations are measured from the bottom of the reservoir/bay.

(2) Once a pump is switched off due to a low level in the upstream effluent bays, the pumps are only allowed to restart once the level rises past the off level and beyond a buffer that prevents the pumps from switching off and on in rapid succession.

(3) The effluent bays are chlorine contact basins that require a certain hydraulic level in order for effluent to meet the required contact times.

6.4.4 Extended Period Calibration Results

After adjustments were made for system controls, pipe roughness, and other factors, the EPS model calibration results correlated closely with the field data for the 24-hour period. The correlation of model results with actual field conditions was accomplished by comparing three different field measurements with the associated model output data. Comparisons were made for reservoir level variations, booster pump station flow rates, and booster pump station discharge pressures. These comparisons are shown in Figures 6.4 through 6.6. As shown in the figures, SCADA data is represented by discrete points while the model output is represented by a solid line.

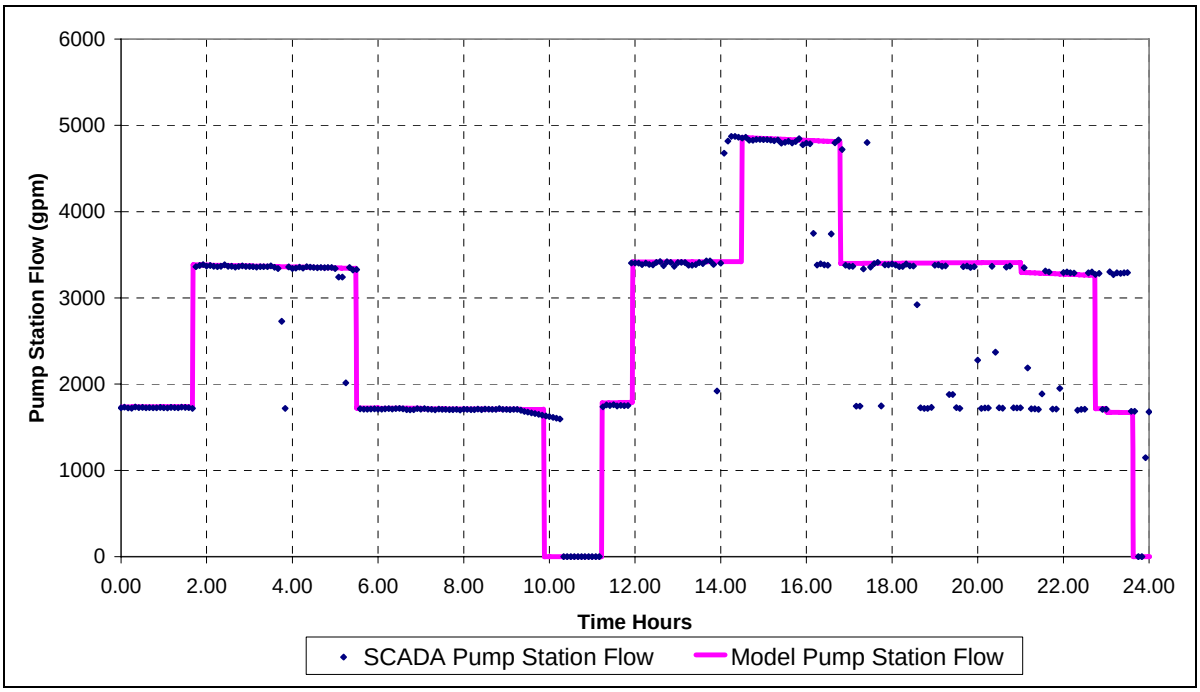


Figure 6.4 Pump Station Discharge Flow

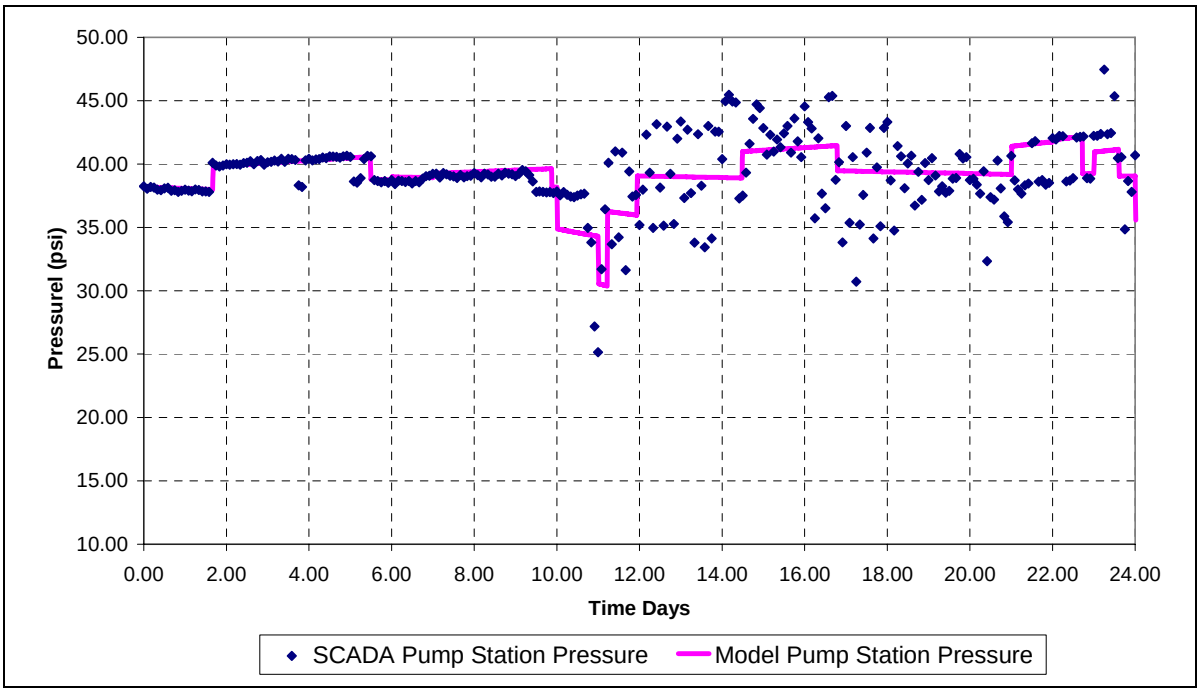


Figure 6.5 Pump Station Discharge Pressure

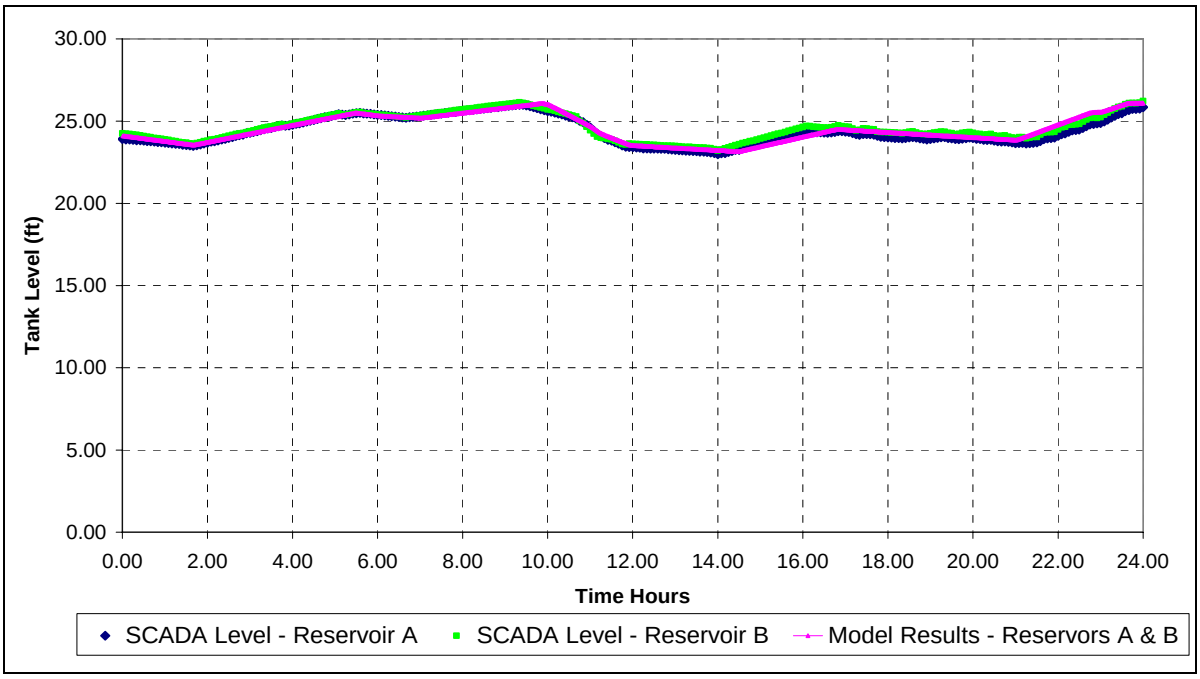


Figure 6.6 Reservoir Levels

As shown in Figures 6.4 through 6.6, the model output closely matches the SCADA data. The tank level matches the SCADA data to within a few percentage points. The pump station flows and discharge pressures also generally match the SCADA data to within a few percentage points (approximately $\pm$ 5 %) Deviations greater than a few percentage points do exist. The likely causes of these deviations are explained below.

- Time Step. Certain variables within the model such as demand are recorded based on a time step. Time steps only allow for discrete changes that probably do not closely reflect the continuous changes occurring in the system.
- System Instability. The right combination of conditions in the field may cause certain system variables to fluctuate. At certain system operating points, system operations can proceed in either of two directions because of slight fluctuations. An example of this would be the field recorded pressure and flow rate fluctuations between hours 16 and 24 (Figures 6.4 and 6.5). During this time, a pump was most likely starting and stopping in frequent cycles, thus creating an unstable condition. Model results typically reflect a performance that best fits these fluctuations. As a result, the model provides reliable long-term predictions needed to accurately gauge planning decisions.

In summary, the calibration results indicate the model generally predicts conditions similar to those observed in the field. Within a few areas of the model, there may be unknown local conditions, but the overall distribution system is adequately represented by the model. Based on the results of the calibration, it can be concluded that the model is calibrated to steady state and extended period conditions. The model provides an accurate representation of the City's recycled water distribution system. Model performance is within

tolerances that are suitable for the purposes of identifying system deficiencies and evaluating capital improvements to the City's recycled water distribution system.

6.5 FUTURE SYSTEM MODEL CREATION

The calibrated model only represents the existing system recycled water infrastructure. However, the main purpose of the development of the hydraulic model was to create a tool that can be used to size future system expansions. The existing system model was therefore used as a basis to create various model scenarios to evaluate and size future system expansions. To create the future system scenarios, new pipelines, nodes, customer demands, and facilities were added to the model. Controls from the existing calibrated system were imported and were modified as necessary to create working future system model scenarios.

6.5.1 Model Scenarios

The hydraulic system model includes the following two existing system scenarios:

- Existing System. Including ADD and MMD conditions.
- Calibration. Including the data from the calibration day.

The hydraulic system model includes the following two future system scenarios:

- Recommended System. Includes ADD and MMD conditions for Segments 1, 2, 7, and 9 (Segments are defined in Chapter 8, see Figure 8.2).
- Complete System Loop. Includes ADD and MMD conditions for all segments.

These scenarios were run in the model to approximate future system infrastructure and facility criteria.

6.5.2 Future Model Pipes and Junctions

Pipes and junctions were added to the model and the various scenarios were run to determine the proper pipe sizes so that pipe velocity and junction pressures were within the desired evaluation criteria described in Chapter 5.

6.5.3 Future Model Facilities

Model facilities were added as the model pipes and junctions were created. If a scenario run determined pressure was too low, a pump station was typically added to boost pressure. This created a separate pressure zone in the model. If supply did not balance demand, a reservoir was added. These facilities were sized to provide a steady supply and adequate pressure to new potential customers.

6.5.4 Future System Controls

Controls were established for the new facilities so that the model would run according to a similar operational philosophy as the existing system and to obtain reasonable fluctuations in reservoir levels and system pressures.

Pump stations were set to operate so that adequate pressure would be provided during demand hours. Since the recycled water system does not float on gravity reservoirs, the pump stations are typically controlled by discharge pressures and pumps area activated when the system pressure drops below a certain level.

Chapter 7

EXISTING SYSTEM EVALUATION

7.1 INTRODUCTION

This chapter evaluates the existing system to identify issues that must be resolved for continued system operation and for preparation of future system expansions. This chapter consists of the following three sections:

- Condition assessment;
- Hydraulic analysis; and
- System operations evaluation.

Where appropriate, recommendations are made to address system deficiencies and/or system optimization.

7.2 CONDITION ASSESSMENT

The condition assessment was undertaken to verify that the existing facilities are in a suitable condition for both continued system operation and system expansion. The condition assessment included a field evaluation of key assets by a multi-discipline engineering team licensed and experienced in the areas of civil engineering, mechanical engineering, and structural engineering. The assessment team visited the City of Pomona's (City's) recycled water facilities, inspected the major assets, and interviewed operations and maintenance (O&M) personnel regarding the operation and maintenance history of the major assets. Figure 7.1 shows the location of the facilities evaluated during the assessment.

The information gathered during the condition assessment provides a standardized record of the asset condition specific to each discipline. Data collected for each asset included condition, installation year, and discipline-specific data as applicable. In addition, other relevant information, such as recent performance history, and design and sizing criteria was gathered where available, and the existing condition of all assets was documented with digital photos. To standardize the process of determining an asset's condition, specific discipline-related questions were answered for each asset. Sample field sheets and discipline questions are presented in Appendix G.

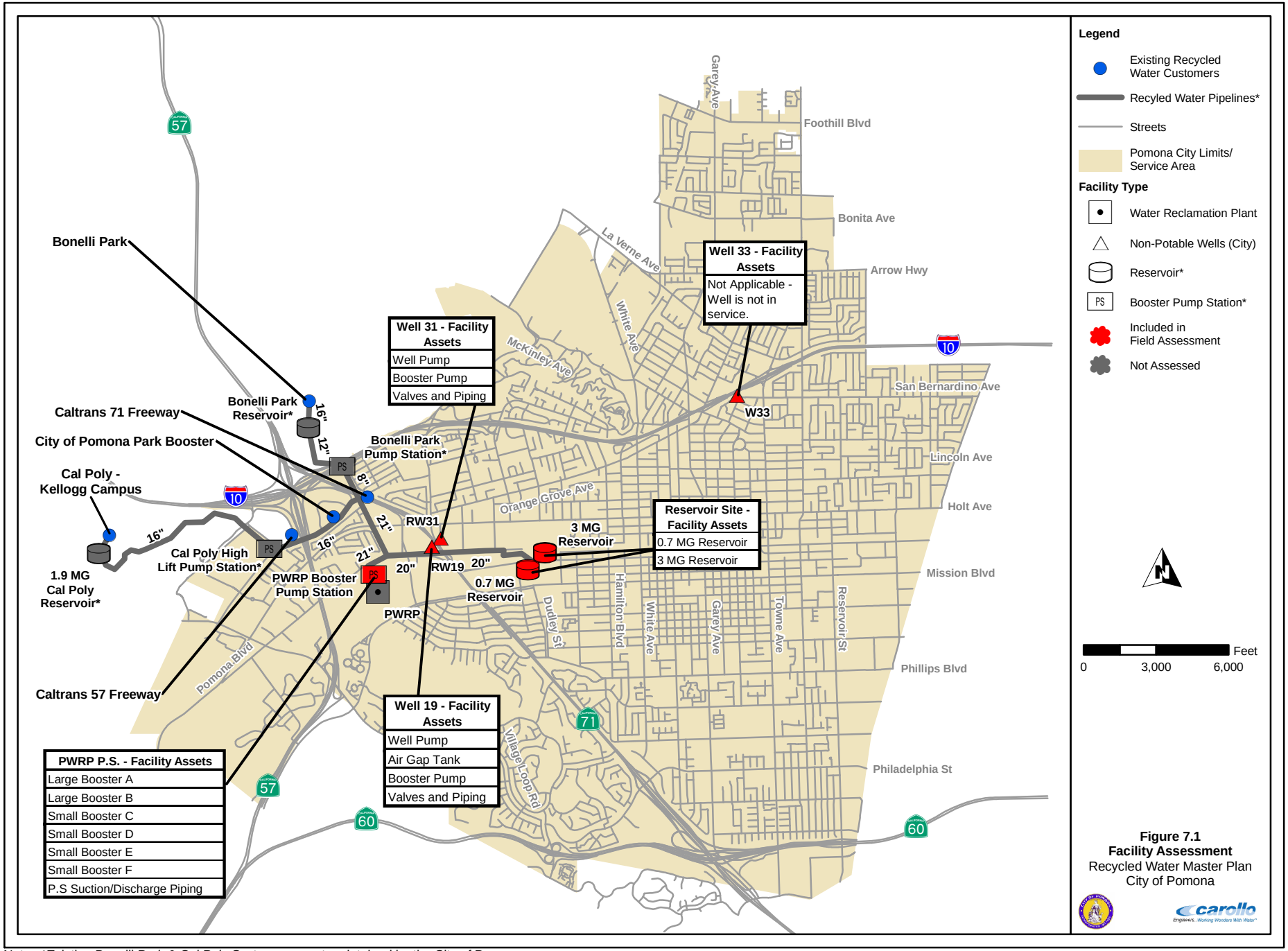


Figure 7.1
Facility Assessment
Recycled Water Master Plan
City of Pomona

Note: *Existing Bonelli Park & Cal Poly Systems are not maintained by the City of Pomona.

The conditions assessment includes the determinations of the following criteria:

- Condition Assessment Ranking
- Level of Service
- Original and Evaluated Remaining Useful Life
- Economic Remaining Useful Life
- Replacement Value
- Repair Cost

Each of the criterions is briefly defined below, while Appendix G includes a more detailed description.

- Condition Assessment Ranking. The Condition Ranking is a value based on the percentage of the value of the asset that was required to return each asset to essentially new condition (i.e., restored to original physical condition, useful life, etc.) Each asset was ranked on a 1 through 5 scale (for a non-existing asset, a ranking of 0 is assigned).
- Level of Service (LOS). The Level of Service is a value that defines the target condition value desired for each asset. The ranking scale used to assign a LOS to each asset is the same as the condition scale. A LOS of 2 was considered reasonable for the City to meet its service goals (see Appendix G).
- Original and Evaluated Remaining Useful Life. Original useful life (ORUL) is the number of years an asset is expected to be in service as a function of asset type (i.e., mechanical, structural, electrical, instrumentation and control) and evaluated remaining useful life (ERUL) is the original useful life less the number of years an asset has been in service.
- Economic Remaining Useful Life. The economic remaining useful life of an asset is the estimated period between the date of the condition assessment and the time when the asset degrades to a condition where repairing the asset ceases to be cost effective.
- Replacement Value. For this project, replacement value is defined as the cost to replace the asset with a similar piece of equipment in April 2009 dollars.
- Repair Cost. Repair costs are defined as the cost required to return an asset to a specified level of service.

These condition assessment criterions are used as the basis for evaluating the most cost-effective means of maintaining the City's existing recycled water system and prioritizing potential rehabilitation and replacement (R&R) projects.

7.2.1.1 Assessment Results

Based on the aforementioned criteria, the aboveground assets in the City's recycled water distribution system are prioritized in Table 7.1 in order of perceived maintenance. Criteria used to prioritize these assets included condition, ERUL, and economic remaining useful life. This table should aid the City in making planning decisions related to maintenance and operation, as well as capital decisions. R&R projects implemented based on the Table 7.1 will assist with the continued proper operation of the system during both existing conditions and under increased stresses from future system expansion.

In general, each facility was operating at a level sufficient for the City to meet its service goals. Although many facilities required sand blasting and a new coat of paint, these items are superficial, but in some cases may indicate that a piece of equipment requires monitoring for potential maintenance depending on the equipments' age. Several of the pumps at the recycled water pump station were corroded. At Well 19, the check valve for the connection to the distribution system was leaking. Also, the inlet/outlet pipe connections to the steel tank reservoirs are rigid and will not allow movement of the reservoir during a sizeable earthquake, consequently, these connections will fail during a large earthquake, causing damage to the tank. If interruption to service is a concern, replacement of the reservoir inlet/outlet pipe connection should be considered. The other facilities (pump stations and wells) should not suffer significant damage in a seismic event; however, older bolts that hold equipment to existing pads have the potential for shear failure during a severe event.

The current breaker is in poor condition and trips when all pumps are running. Assessment of the current motor control center (MCC) configuration shows that both the breaker and the switchboard should be replaced. The switchboard is old, obsolete, and beyond its useful life and replacement parts are difficult to obtain. Consequently, procurement of the necessary parts for the integration of a new breaker into the switchboard would be expensive. Therefore, for continued service, it is recommended that the City replace both the switchboard and breaker. In addition, as discussed in Section 7.4, a new switchboard is needed if the City wants to install variable frequency drives (VFDs) for each pump. If a new switchboard is installed, it should include a portable generator connection and a manual transfer switch for backup power. Coordination would be needed with Southern California Edison (SCE) for the removal of existing metering and the installation of new metering and associated appurtenances since the metering is integral with the switchboard. Replacement of the switchboard and breaker, including testing, should not exceed two weeks.

Table 7.1 Existing Assets Prioritized by Condition and Economic Remaining Useful Life
Recycled Water Master Plan
City of Pomona

No.	Facility [1]	Asset Name [1]	Condition [2]	Level of Service	Replace-ment Value	Repair Cost [3]	Original Useful Life	Evaluated Remaining Useful Life	Economic Remaining Useful Life
1	PWRP PS	Pump Station Breaker and Switchboard	5	2	$30,000	$30,000	20	2	0
2	PWRP PS	Large Booster A	4	2	$125,000	$32,000	20	12	2
3	Well 19	Well Pump	4	2	$100,000	$26,000	20	12	2
4	PWRP PS	Small Booster E	4	2	$90,000	$24,000	20	12	2
5	PWRP PS	Small Booster D	4	2	$90,000	$23,000	20	12	2
6	PWRP PS	Suction/Discharge Piping	3	2	$225,000	$24,000	20	16	6
7	PWRP PS	Large Booster B	3	2	$125,000	$13,000	20	16	6
8	PWRP PS	Small Booster F	3	2	$90,000	$10,000	20	16	6
9	Well 31	Booster Pump	3	2	$60,000	$9,000	20	16	6
10	Well 19	Valves and Piping	3	2	$70,000	$7,000	20	16	6
11	Well 31	Valves and Piping	3	2	$65,000	$7,000	20	16	6
12	Well 19	Booster Pump	3	2	$65,000	$7,000	20	16	6
13	Well 19	Air Gap Tank	2	2	$30,000	$0	50	45	20
14	Reservoirs	3 MG Reservoir	2	2	$4,030,000	$0	49.8	44.8	19.9
15	Reservoirs	0.7 MG Reservoir	2	2	$1,430,000	$0	49.4	44.4	19.7
16	PWRP PS	Small Booster C	N/A	2	$0	$0	N/A	N/A	N/A
17	Well 31	Well Pump (Submersible) [4]	N/A	2	$0	$0	N/A	N/A	N/A
18	Well 33	Well Pump [5]	N/A	2	$0	$0	N/A	N/A	N/A
						Total Repair Cost	**$212,000**		

Notes:
(1) The location of these facilities and assets are shown on Figure 7.1.
(2) Condition rankings are a cost weighted average of discipline-specific condition rankings, and where applicable the mechanical and structural rankings are shown in parentheses by an M or S, respectively.
(3) Repair costs are project costs that include a contingency, general conditions, contractor overhead, sales tax, bid market allowances, and engineering, legal and construction fees.
(4) Asset not visible for inspection.
(5) Asset non-existent.

7.3 HYDRAULIC ANALYSIS

The hydraulic analysis used the calibrated hydraulic model to evaluate the existing recycled water system for possible deficiency correction and optimization under the following demand conditions:

- Average Day Demand (ADD)
- Maximum Month Demand (MMD)
- Peak Hour Demands (PHD)

As explained in Chapter 3, Maximum Day Demand (MDD) conditions are assumed to be the same as MMD conditions. The goal of the hydraulic analysis is to identify system improvements required for efficient system operation and increased system utilization in future expansions.

7.3.1 Average Day Demand

The model was run under ADD conditions to determine the maximum pressures that occur in the existing system. Under ADD conditions, the pressure fluctuates between 25 to 40 pounds per square inch (psi), which is below the minimum pressure criteria of 40 psi.

Under ADD, the storage volume in the two tanks never decreased below 80 percent of full capacity. However, ADD is typically not used to size storage since the demands are less than MMD. MMD, discussed in the next section, is used to evaluate the adequacy of the existing storage because MMD demands place a greater stress on system components, especially storage.

7.3.2 Maximum Month Demand

The model was again run under MMD conditions to determine the adequacy of existing storage. Under MMD conditions, the pressure fluctuates between 22-40 psi, which is below the minimum pressure criteria of 40 psi.

Under MMD, the storage volume in the two existing tanks never decreased below 70 percent of full capacity. In addition, the 3.7 million gallons (MG) of existing storage meets the evaluation criteria for operational and emergency storage requirements. Not only is system storage adequate, capacity is available for future peak demands.

7.3.3 Peak Hour Demand

Pipes sizes were evaluated using PHD conditions, since this condition results in the greatest system flow rates. All the distribution mains in the City's existing system are 16-inch diameter and larger. Under peak hour conditions, all pipe velocities are below 6 feet per second (ft/s) except the 16-inch diameter pipeline extending to Cal Poly Pomona along South Campus Drive. The maximum velocity criterion for a pipe with a diameter greater

than 12 inches is 6 ft/s. During peak hour conditions, the 16-inch diameter pipeline flows at 7 ft/s and the 21-inch diameter pipeline shown on Figure 7.1, north of the Pomona Water Reclamation Plant (PWRP), flows at the 6 ft/s capacity when both the Cal Poly and Bonelli Park pump stations (PS) are operating at capacity. This analysis assumed the following capacities for these pump stations:

- Cal Poly Pomona Recycled PS - 4,500 gpm (based on correspondence with Cal Poly)
- Bonelli Park Recycled PS - 2,100 gpm

Consequently, these two customers are unable to increase the capacity of their respective pump stations unless the City's recycled water supply and pipelines are upgraded or parallel pipelines are installed.

System pressures were also evaluated under PHD conditions. During PHD conditions, system pressures fluctuated between 20-35 psi, which is below minimum pressure criteria of 40 psi. The pressures are low because the system floats on two reservoirs that have a low hydraulic grade line (HGL). These reservoirs are shown on Figure 7.1. Changes are not recommended for three reasons:

- Age of the Distribution System. The system was installed in the 1960s and increasing the pressure could create stress on the system that would increase the frequency of repairs.
- Customer Pump Stations. Existing customers with large demands, such as Cal Poly Pomona and Bonelli Park, use pump stations to pump recycled water from the system thus making a higher pressure unnecessary.
- System Modifications. Spending money to install new pumps both at the reservoir and the pump station, so higher pressures can be sustained does not provide a significant benefit, especially, when the same resources could be utilized to expand the system to new customers.

According to the hydraulic analysis, the existing system has adequate storage for the existing demands along with capacity for future needs within the planning horizon. Existing pipelines are adequate for existing demands. The existing 16-inch and 21-inch diameter pipelines north of the PWRP will need to be upgraded if Cal Poly or Bonelli Park upgrade their pump stations to a higher capacity in order to meet increased future demands. This upgrade would involve either paralleling pipeline or increasing pipeline diameter. During design, the most feasible alternative would be selected; however, parallel pipe would allow continued service. If Cal Poly increases flow, approximately 2,600 feet of 21-inch pipe under Ridgeway Street and 4,100 feet of pipe under South Campus Drive would need to be upgraded. If Bonelli Park increases flow, only the 2,600 feet of 21-inch pipe under Ridgeway Street would need to be upgraded. Upgrading the pipes is feasible only if supply is available from the PWRP (i.e. this supply has not already been allocated to future

customers). If upgrading the pipes is required, the City would need to coordinate funding with either Cal Poly or Bonelli Park depending on which agency is increasing demand.

7.4 SYSTEM OPERATIONS EVALUATION

The system operations evaluation was conducted to review the existing system controls and monitoring procedures to determine opportunities to increase energy efficiency, optimize system performance, and increase system reliability. As part of this analysis, backup power configuration was also examined for possible changes.

7.4.1 System Controls and Monitoring

The City's supervisory control and data acquisition (SCADA) system currently monitors the PWRP recycled water PS, non-potable Wells 19 and 31, and the recycled water reservoirs. A screenshot of the City's SCADA system interface is shown on Figure 7.2. Flow rates and system pressures are recorded at the pump station and water levels are recorded at the reservoirs. The fixed speed pumps at the PS are controlled such that they maintain a desired hydraulic level in the two recycled water reservoirs. The pumps operate off a small wet well that is downstream of the PWRP chlorine contact basin effluent weir. As the water level in the wet well declines, pumps are turned off.

The current configuration of the City's recycled water PS does not allow for energy savings through operational control modifications. Energy savings are typically realized if pumping operations are delayed until night when electricity rates are lower. Due to the absence of a recycled water effluent forebay at the City's recycled water PS and/or a gravity reservoir, the City must pump plant effluent whenever it is available. Otherwise, the plant effluent discharges into San Jose Creek from the overflow weir in the small wet well. Consequently, the City is unable to save energy by delaying pumping.

The discharge of recycled water effluent into San Jose Creek is a condition that should be avoided during PHD periods. As part of this analysis, configuration changes were identified to help the Sanitation Districts of Los Angeles County (SDLAC) avoid unnecessary discharges to San Jose Creek and minimize the use of potable water during peak demand periods. These changes include:

- Installing VFDs on the recycled water PS at the PWRP.
- Using the existing reservoir monitoring and creating a new SCADA algorithm that calculates the exact amount of potable makeup water addition needed during peak seasonal demand periods.

These recommendations are discussed in more detail below.

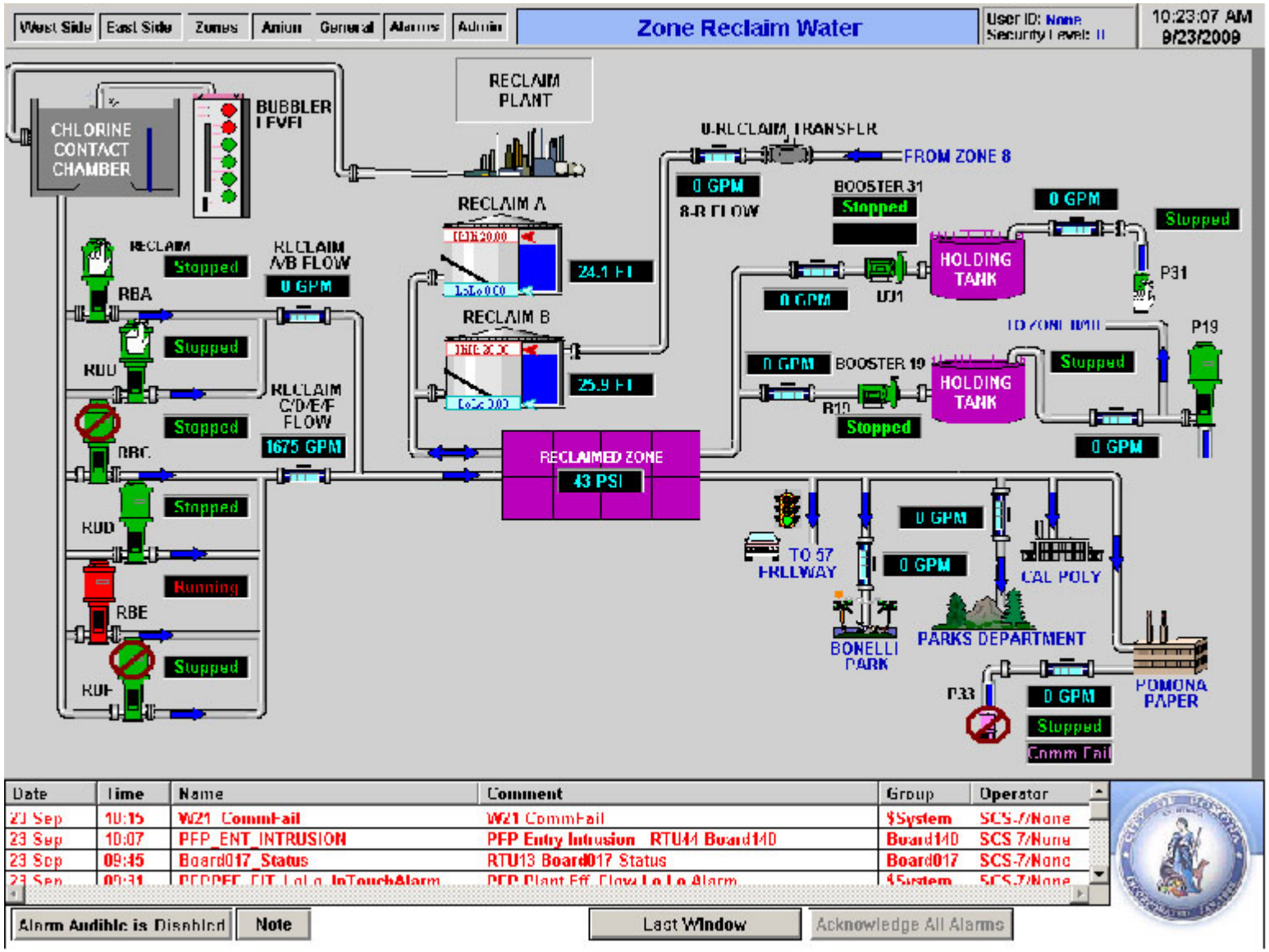


FIGURE 7.2

SCADA SCREEN SHOT

7.4.1.1 Installing VFDs

Installing VFDs will allow the Recycled Water PS flow rate to closely match the effluent flow rate from the plant. If VFDs are installed, the City has the option to utilize almost all of the PWRP flow when it is needed since it can match pump flow with the effluent flow from the plant. The City's fixed speed pumps are unable to closely match the plant effluent flow rate and the City must pump less than the effluent flow; otherwise, the suction wet well will quickly be drawn down and the pumps will shut down. Currently, the City's five fixed speed pumps are able to supply the City's recycled system with an adequate quantity of recycled water from the plant since the existing demand is much less than the City's historical demand. However, as the City expands its system in the future, demand will start to match supply and the City will need the ability to pump its full two-thirds allocation of PWRP effluent flow. If the City is to fully utilize the PWRP as a supply source, the City should consider installing VFDs on the pumps so that pump station flow can match plant effluent flow as close as possible.

To provide VFD driven pumps, a new switchboard would be required and the entire MCC line-up would need to be replaced with a new VFD line-up. The existing line-up is old and retrofitting the existing switchboard and existing cabinets with new VFDs would be prohibitively expensive. In addition, new inverter-duty rated motors would be required including new conductors for the motor leads. New separate power and control conduits would also be required to prevent signal interference between signal/control and the power output of the VFD. Installation and testing of the new switchboard and MCC units with VFDs would take about 2 weeks or possibly less of a new switchboard is already installed at the time of installing the VFDs. During this time, temporary power could be provided to the pumps. SCE service and the existing transformer should remain the same since the electrical loads are not increasing; however, coordination could be required with SCE for the installation of new metering and the associated appurtenances at the current transformer if a new switchboard is installed.

7.4.1.2 Reservoir Level Monitoring

The City currently monitors the levels in both of its recycled water reservoirs through the SCADA system. It is suggested that the City, using this existing monitoring, create a function in the SCADA system that calculates the exact amount of potable makeup water addition needed during peak seasonal demand periods.

During the peak summer months when irrigation demands are high, recycled water demands could exceed system supply. In such a case, the hydraulic level in the City's existing recycled water reservoirs will not return to the initial water level over a 24-hour period. It is suggested that the City have SCADA calculate the difference between reservoir levels for a specified time of the day e.g. the difference between 12:00 pm on Monday and 12:00 pm on Tuesday. If the difference is significant, the system demand most likely exceeded the available supply. The difference in the measured level in a 24-hour period

would equate to the exact amount of potable water addition needed for the system. This calculation would inform the operator of the exact amount of potable makeup water needed, or the City could have SCADA use this difference for automated potable water make-up addition. This calculation would help ensure that only the necessary amount of potable water is added to the system, while providing sufficient water in the reservoirs.

7.4.2 Backup Power

Currently, the City does not have backup power for its recycled water system facilities. Facilities without backup power include Wells 19 and 33 and the recycled water PS at the PWRP. The SCADA system does have backup power and the sensors at the two reservoirs have short-term batteries for continued communication with SCADA during an outage. The current backup power configuration does not meet the evaluation criterion that stipulates adequate backup power to serve MMD without interruptions.

During a short power outage irrigation customers could typically interrupt the use of recycled water without adverse effects. However, potential non-irrigation customers, such as car washes or other commercial or industrial customers would immediately be impacted during an outage and require instantaneous potable make-up water to continue normal business operations.

During a prolonged power outage, the City would supply its recycled water customers with potable water through the makeup connection at the two reservoirs. However, this option would only be utilized for customers that would incur significant adverse effects due to the unavailability of water. For future expansions, it is recommended that future facilities include backup power for to continue normal operations and serve MMD during a power outage. In addition, when the City replaces the breaker and switchboard at the recycled water PS, it is recommended that a portable generator connection with a manual transfer switch be provided with the new switchboard.

7.5 SUMMARY OF EXISTING SYSTEM RECOMMENDATIONS

Based on the condition assessment, the hydraulic analysis, and the system operations analysis, the following recommendations are made for the City's existing recycled water system:

- The City currently has a maintenance program for its recycled water system. The results of the condition assessment, shown in Table 7.1, should act as an additional reference for assessing maintenance needs in the City's maintenance program. The assessment reaffirmed the City's high maintenance priority for certain pumps at the recycled water pump station and Well 19. Continued maintenance under the City's current program including R&R projects implemented based on Table 7.1 will assist with the continued operation of the system during both existing conditions and under increased stresses from future system expansion.

- Pipelines provide adequate conveyance capacity for existing demands; however, the City would possibly need to upgrade the 16-inch and 21-inch diameter pipelines north of the PWRP if either Cal Poly or Bonelli Park upgrades their pump station to a higher capacity to meet the projected future demands. For this reason, the City should monitor and be involved with any plans either entity may have for enlarging their pump stations.
- The City should continue to maintain the current pressures in the existing system even through these pressures are below the values in the evaluation criteria. The current pressure values are adequate for continued operation of the existing system; however, for a future system, pump stations will be required to pressurize expansions branching from the existing system.
- The City should install VFDs at the existing recycled water PS at the PWRP. These VFDs will allow the City to fully utilize the effluent flow from the Plant, while avoiding unnecessary discharges to San Jose Creek during peak demand periods. The SDLAC is responsible for production and discharges at the Pomona Reclamation plant; as a result, SDLAC is tasked in dealing with regulators.
- The City may want to consider creating a SCADA function that calculates the difference in reservoir level over time and in 24-hour intervals. The SCADA system can use this information to calculate the amount of potable make-up water required to balance the reservoirs and to control an automated potable water make-up addition.
- The City should install backup power for its recycled water facilities in addition to the current ability to use potable make-up water during a power failure.
- The City should install a portable generator connection with a manual transfer switch when the City replaces the breaker and switchboard at the recycled water PS.

FUTURE SYSTEM EVALUATION

8.1 INTRODUCTION

This chapter evaluates the feasibility of system expansions of the City's existing recycled water system to serve the potential recycled water customers identified in Chapter 3. The evaluation and sizing criteria described in Chapter 5 are used to size these system expansions. This chapter is divided into the following four sections:

- Evaluation Methodology. This section discusses the methodology used for the creation segments and alternatives, as well as, the selection of the recommended recycled water system expansion projects.
- Future System Segments. A future recycled water system layout that serves all potential customers was developed and divided into segments. This section presents the pipelines and facilities for each segment, which were sized using the hydraulic model. Planning level cost estimates are also presented for each segment.
- Future System Alternatives. This section compares the segments based on unit cost and other considerations and groups the segments into alternatives.
- Recommendations. The alternatives are compared and a recommended system is selected for the planning horizon of this recycled water master plan (RWMP). In addition, the ultimate system is described.

The Capital Improvement Program (CIP) for this recommended system and ultimate system is described in Chapter 9 of this RWMP.

8.2 EVALUATION METHODOLOGY

Using information from previous chapters, the future system evaluation uses the hydraulic model to develop potential system expansion alternatives that are within demand, supply, and evaluation criteria constraints. This section discusses the methodology used for the creation of alternatives and the selection of a recommended system for implementing recycled water system expansion projects. This methodology includes the following steps:

- Development of the initial system layout
- Division of the initial layout into segments
- Definition of segment requirements
- Grouping of segments into alternatives
- Selection of recommended system

This section concludes with the selection of the preferred recycled water system alternative.

The first step in developing a future system is the development of the initial layout of a potential recycled water system. This system would serve the potential customer demands with the potential recycled water supplies as discussed in Chapters 3 and 4, respectively.

The initial layout attempts to find an ideal solution for serving the entire City. Accordingly, pipelines are placed to both maximize demand and minimize cost. This initial layout is shown on Figure 8.1. As shown in this figure, customer demands are displayed according to their magnitude. Pipes are located such that the system can serve the maximum demand with the minimum total pipeline length. This means connecting large customers first (anchor customers) and then connecting small "pick-up" customers where feasible along the proposed main alignments.

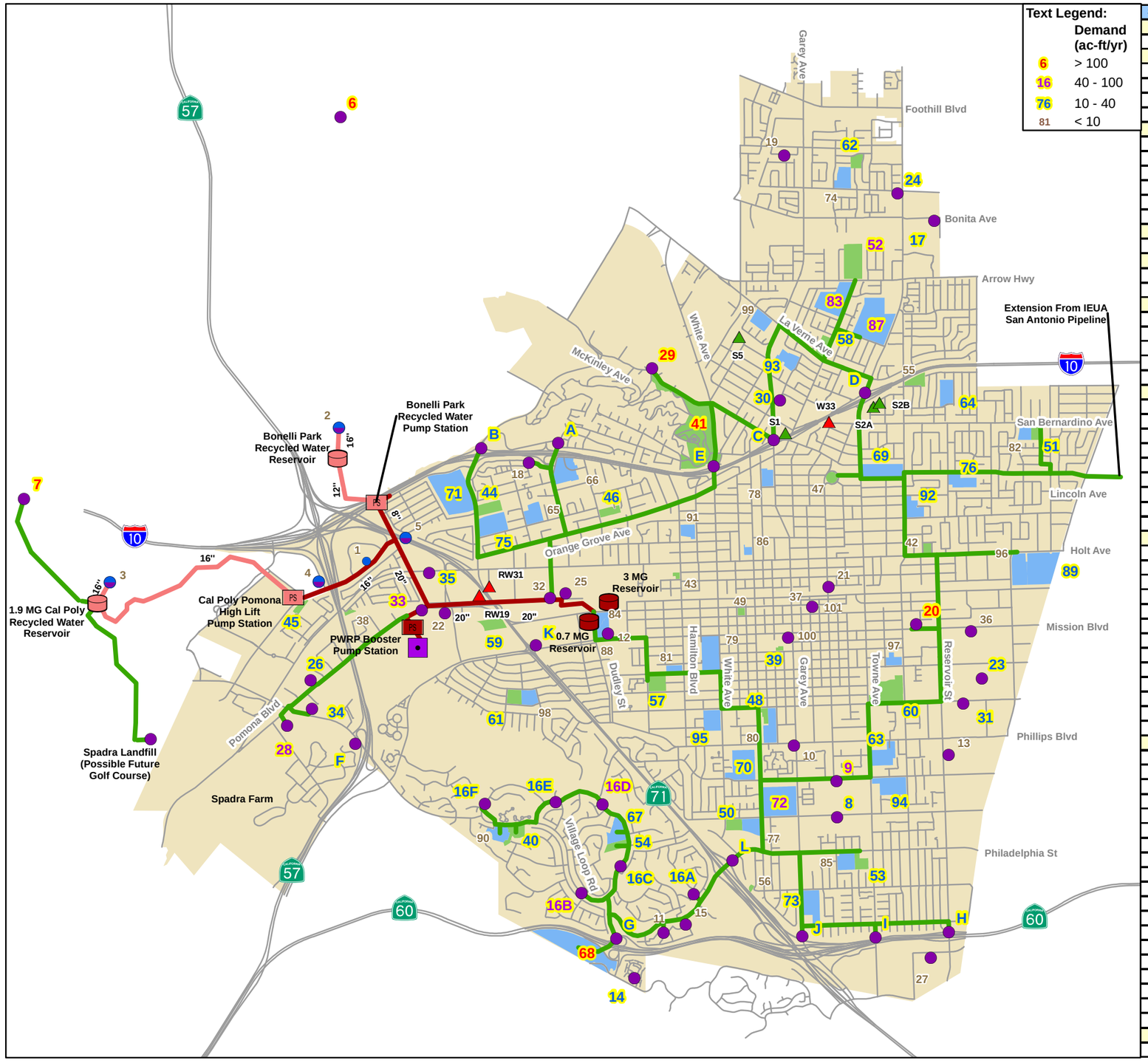
The initial layout provides the best solution for serving the entire City; however, the total cost of a system serving all potential customers is typically relatively high. In order to make expansion of the recycled water system more cost-effective, the initial system layout was divided into nine (9) segments. The division of the initial system layout into segments is shown in Figure 8.2. Where possible, segments isolate portions of the initial system layout that have a cost-effectiveness that is greater than original cost-effectiveness of the initial system layout. Typically, these more cost effective segments include a large customer or anchor customers at the end of the segment that increases demand and reduces cost. Consequently, the cost effectiveness of the segments will vary.

Ultimately, the selected segments are grouped into alternatives. The ideal alternative starts with the implementation of the most cost effective segment and ends with the implementation of the least cost effective segment.

8.3 FUTURE SYSTEM SEGMENTS

Nine segments were created from the initial system layout. As shown on Figure 8.2, the segments are:

- Segment 1: Adjacent Existing System. This segment focuses on the existing system. This segment includes connecting customers adjacent to the existing system and making modifications to existing customer systems, so that they may use more recycled water.
- Segment 2: Lanterman Extension. This segment extends the existing system south to the anchor customer Lanterman Hospital.
- Segment 3: Fairplex/Ganesha Park Expansion. This segment extends the existing system to Ganesha Park and the Fairplex, which act as anchor customers.
- Segment 4A: North Extension. Segment 4A is an expansion of the existing system to the area immediately north of the existing system.
- Segment 4B: Park West Extension. Segment 4B extends the existing system from Segment 3 to supply customers between Ganesha Park and Park West High School.



Text Legend:

	Demand (ac-ft/yr)
6	> 100
16	40 - 100
76	10 - 40
81	< 10

Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
B	I-10 & Fairplex	H	SR-60 & Reservoir Rd.
C	I-10 & Garey	I	SR-60 & Towne
D	I-10 & Towne	J	SR-71 & Garey
E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
Potential Customers - Cemeteries			
7	Forest Lawn Mortuary	9	Pomona Cemetery
8	Holy Cross Cemetery		
Potential Customers - Homeowners Associations			
10	Amcal Portofino Villas	15	Phillips Meadows
11	Country Pk Villas	16	Phillips Ranch(A - F)
12	Estates-Pomona Westland	17	Quail Creek Pomona
13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
20	Braun Linen Service	29	Pomona Fairplex
21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
37	Centennial Park	50	Mlk Jr Memorial Park
38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
40	Country Crossing Park	53	Philadelphia Park
41	Ganesha Park	54	Phillips Ranch Park
42	Garfield Park	55	Pomona Jaycee Park
43	Hamilton Park	56	Powers Park
44	John F. Kennedy Park	57	Ralph Welch Park
45	Kellogg Park	58	Ted Greene Park
46	Kiwanis Park	59	Veterans Park
47	Lincoln Park	60	Washington Park
48	Madison Park	61	Westmont Park
49	Memorial Park	62	Willie White Park
Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
66	Cortez Elementary	85	Philadelphia Elementary
67	Decker Elementary	86	Pomona Alternative (PAS)
68	Diamond Ranch Senior High	87	Pomona Senior High
69	Emerson Middle	88	Pomona Vocational
70	Fremont Middle	89	Pueblo Elementary
71	Ganesha Senior High	90	Ranch Hills Elementary
72	Garey Senior High	91	Roosevelt Elementary
73	Garey Village (HS)	92	San Antonio Elementary
74	Harrison Elementary	93	San Jose Elementary
75	John Marshall Middle	94	Simons Middle
76	Kingsley Elementary	95	Vejar Elementary
77	Lexington Elementary	96	Village Academy (HS)
78	Lincoln Elementary	97	Washington Elementary
79	Lopez Elementary	98	Westmont Elementary
80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Wells (City)
- Non-Potable Wells (Simpson Paper Company)
- Potential New Recycled Water Pipelines*

Pomona Existing Recycled Water System

- Booster Pump Station
- Reservoir
- Pipelines

Bonelli Park & Cal Poly Existing Recycled Water System

(Not Maintained by City of Pomona)

- Booster Pump Station
- Reservoir
- Pipelines
- Streets

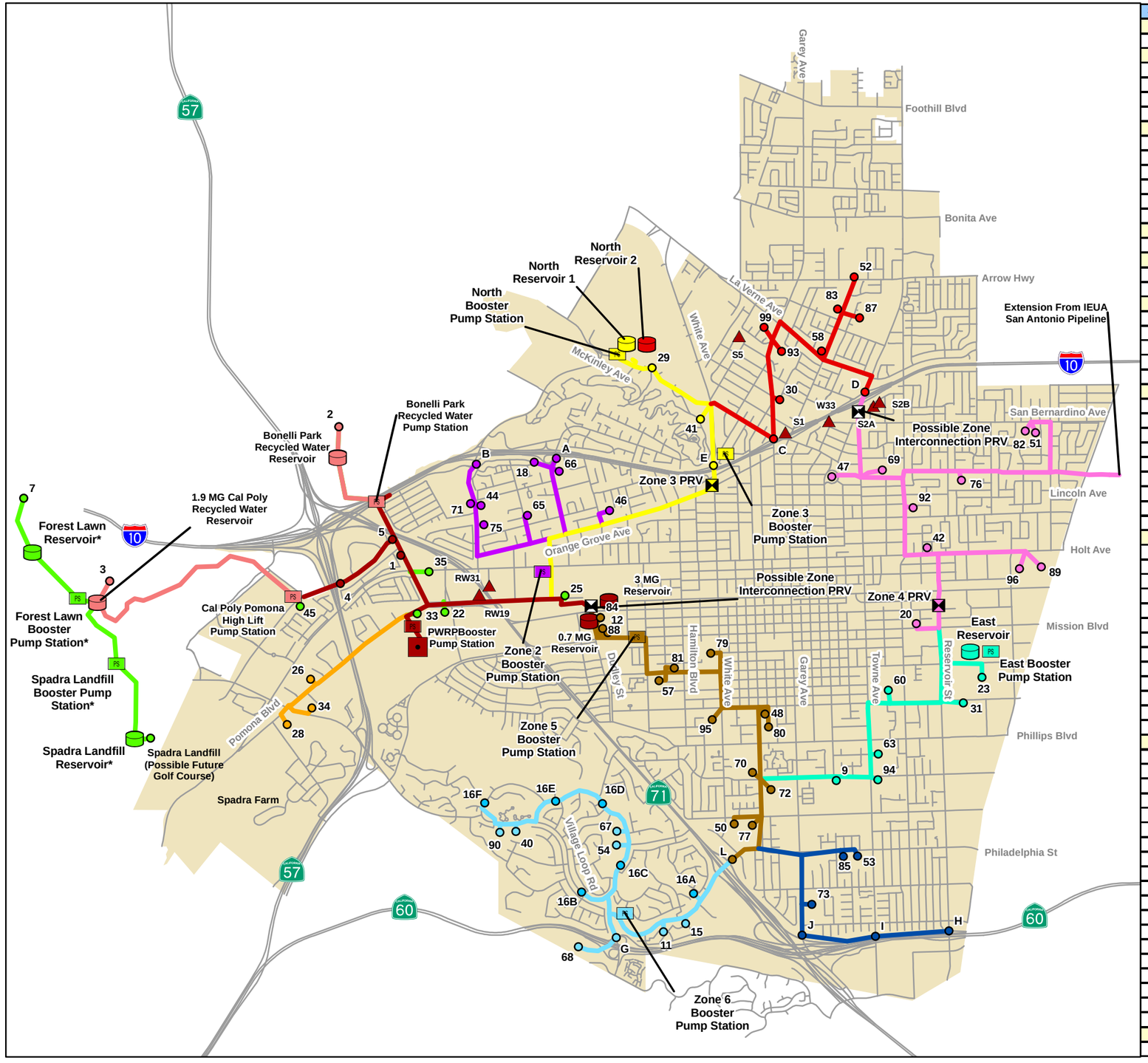
Recycled Water Customers

- Existing Recycled Water Customers
- Existing Recycled Water Customers with Additional Supply Needs
- Potential Recycled Water Customers
- Potential Recycled Water Customers - Schools
- Potential Recycled Water Customers - Parks
- City Limits/Service Area

Feet
0 3,000 6,000

Figure 8.1
Initial System Layout by Customer Demand
Recycled Water Master Plan
City of Pomona

Note: *Potential Bonelli Park & Cal Poly System Expansions are not maintained or financed by the City of Pomona.



Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
B	I-10 & Fairplex	H	SR-60 & Reservoir Rd.
C	I-10 & Garey	I	SR-60 & Towne
D	I-10 & Towne	J	SR-71 & Garey
E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
Potential Customers - Cemeteries			
7	Forest Lawn Mortuary	9	Pomona Cemetery
8	Holy Cross Cemetery		
Potential Customers - Homeowners Associations			
10	Amcal Portofino Villas	15	Phillips Meadows
11	Country Pk Villas	16	Phillips Ranch (A - F)
12	Estates-Pomona Westland	17	Quail Creek Pomona
13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
20	Braun Linen Service	29	Pomona Fairplex
21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
37	Centennial Park	50	Mlk Jr Memorial Park
38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
40	Country Crossing Park	53	Philadelphia Park
41	Ganesha Park	54	Phillips Ranch Park
42	Garfield Park	55	Pomona Jaycee Park
43	Hamilton Park	56	Powers Park
44	John F. Kennedy Park	57	Ralph Welch Park
45	Kellogg Park	58	Ted Greene Park
46	Kiwanis Park	59	Veterans Park
47	Lincoln Park	60	Washington Park
48	Madison Park	61	Westmont Park
49	Memorial Park	62	Willie White Park
Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
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67	Decker Elementary	86	Pomona Alternative (PAS)
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72	Garey Senior High	91	Roosevelt Elementary
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75	John Marshall Middle	94	Simons Middle
76	Kingsley Elementary	95	Vejar Elementary
77	Lexington Elementary	96	Village Academy (HS)
78	Lincoln Elementary	97	Washington Elementary
79	Lopez Elementary	98	Westmont Elementary
80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Well
- Booster Pump Station
- Reservoir
- PRV
- Existing or Potential Recycled Water Customer
- Pipeline
- Existing System: Pomona
- Existing System: Bonelli Park & Cal Poly (Not Maintained by City of Pomona)
- Segment 1*
- Segment 2
- Segment 3
- Segment 4A
- Segment 4B
- Segment 5
- Segment 6
- Segment 7
- Segment 8
- Segment 9
- Streets
- City Limits/Service Area

Feet
0 3,000 6,000

Figure 8.2
Potential System Segments
Recycled Water Master Plan
City of Pomona

Note: *Potential Bonelli Park & Cal Poly System Expansions are not maintained or financed by the City of Pomona.

- Segment 5: East Side Expansion. Using the Inland Empire Utilities Agency (IEUA) as a supply source, this segment extends recycled water service to the east side of the City. Braun Linens acts as an anchor customer for the segment.
- Segment 6: East Side Extension to Garey High. This segment maximizes use of the IEUA supply by extending the initial east side extension to a Garey Senior High School.
- Segment 7: East Side/Existing System Connection. Segment 7 extends the existing system from the existing reservoirs in order to supply customers between the existing system and Phillips Ranch.
- Segment 8: East Side Extension to Route 60. This segment extends service from Segment 7 to additional customers adjacent to Route 60.
- Segment 9: Phillips Ranch Extension. This segment extends service from Segment 7 to the additional customers in the Phillips Ranch area.

In addition to the customer and segments, Figure 8.2 also displays the required facilities such as pump stations, reservoirs, and pressure reducing valves (PRVs). Due to topography, the system would require multiple pressure zones as shown on Figure 8.3. Pipe sizes are displayed on Figure 8.4. The hydraulic model was used to size the pipelines, pump stations, and reservoirs for each segment according to the evaluation criteria in Chapter 5. Each segment is discussed in more detail in the following sections.

8.3.1 Segment 1 - Adjacent Existing System

Segment 1 connects additional customers adjacent to the existing system and recommends modifications to existing customer systems, so that they may use more recycled water. This segment is shown on Figure 8.2.

According to the demand projections from Chapter 3, existing customers could increase their AAD from 2,189 acre-feet per year (ac-ft/yr) to 2,834 ac-ft/yr. This 645 ac-ft/yr increase equates to an ADD and MMD of 0.6 mgd and 1.2 mgd, respectively. The projected demands of the existing customers for year 2030 are shown in Table 8.1. As shown, the future MMD of these customers is estimated to increase to approximately 6 mgd, which is primarily due to the anticipated recycled water demand increase of Bonelli Park and the Cal Poly Pomona. Bonelli Park intends to increase the amount of irrigated existing park areas that are currently not irrigated. Cal Poly intends to both provide recycled water to Forest Lawn and possibly irrigate the Spadra Farm and Landfill areas. Cal Poly (including Forest Lawn) and the Bonelli Park are to pay for the necessary improvements for increased recycled water use at their respective, sites since these improvements would be owned and operated respectively by Forest Lawn Mortuary, Cal Poly Pomona and Los Angeles County Department of Parks and Recreation.

Table 8.1 Existing System Customer Demand - Year 2030
Recycled Water Master Plan
City of Pomona

Customer	ADD (ac-ft/yr)	ADD (mgd)	MMD (mgd)
City of Pomona- Park Booster	17	0.015	0.03
LA Co. Parks - Bonelli Park	1,211	1.0	2.30
SR-57 South Campus. Dr.	26	0.023	0.05
SR-71 South Campus. Dr	51	0.046	0.10
Cal Poly Pomona Total	860	1.7	3.57
Cal Poly Pomona	*1,116*	*1.0*	*2.14*
Spadra Landfill (3)	*413*	*0.4*	*0.8*
Forest Lawn Mortuary (1)	*331*	*0.3*	*0.63*
Existing Customer Total	**2,165**	**2.9**	**6.0 (2)**

Notes:
(1) Includes Forest Lawn recycled water demand since Forest Lawn would connect to the existing Cal Poly Pomona recycled water distribution system.
(2) Current existing customer MMD is 4.2 mgd. This is a 1.8 mgd increase.
(3) Cal Poly considered irrigating the area.

8.3.1.1 Bonelli Park System

According to Table 8.1, Bonelli Park could increase its MMD to 2.3 mgd (1,600 gpm). The existing Bonelli Park pump station should have sufficient capacity for supplying the park under the future demand conditions. Existing facilities include:

- Recycled Water Pump Station - 2,100 gpm capacity.

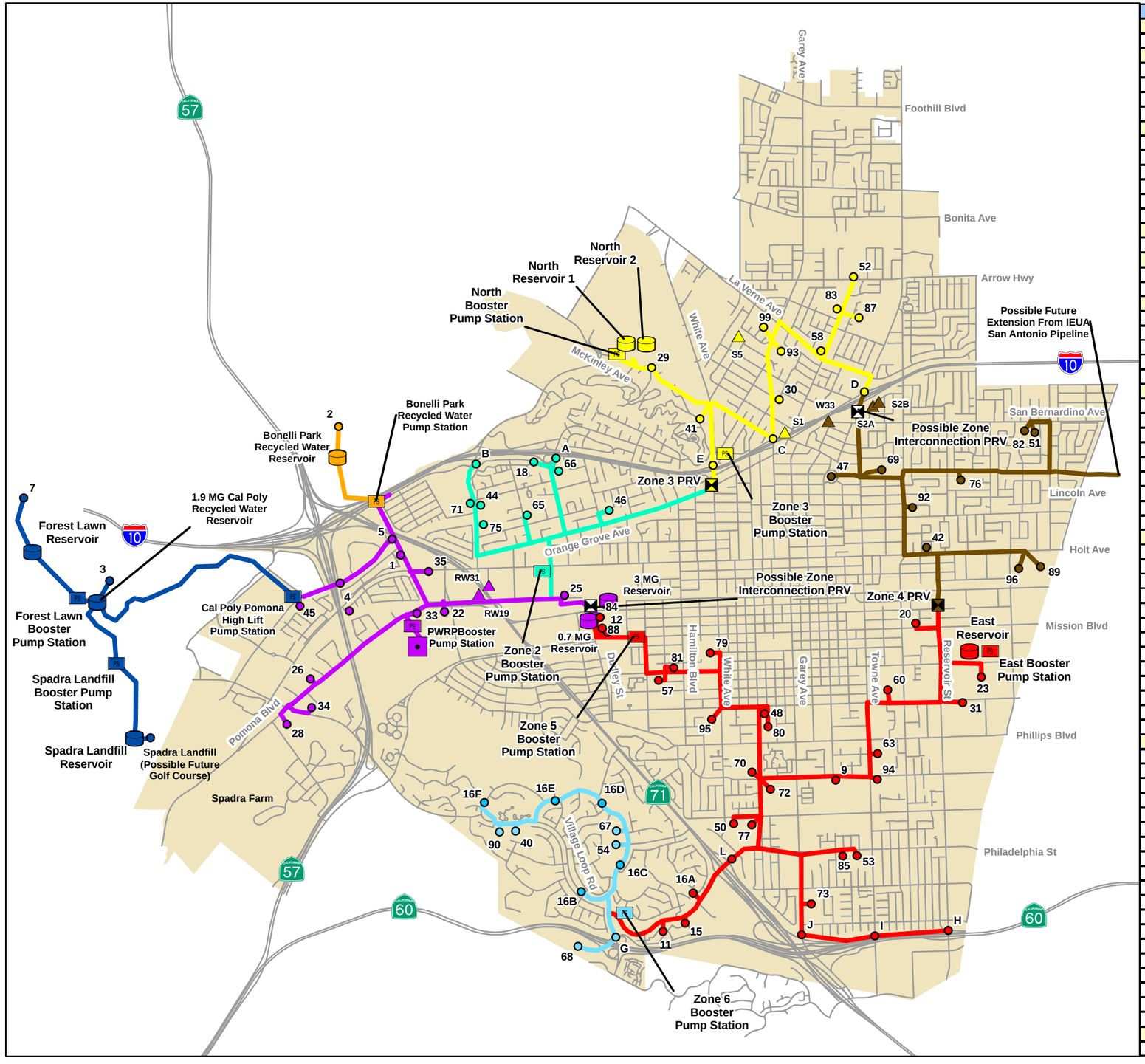
8.3.1.2 Cal Poly Pomona System

According to Table 8.1, the Cal Poly Pomona recycled water system could increase its MMD to 3.6 mgd (2,500 gpm). The existing Cal Poly facilities listed should be sufficient for supplying the system under the increased demand if additional recommended facilities are installed. The existing and recommended facilities are shown on Figure 8.2. Existing facilities include:

- Recycled Water Pump Station - 4,500 gpm capacity (3 pumps).
- Recycled Water Reservoir - 1.9 MG capacity.

Additional recommended facilities include:

- Forest Lawn PS - 3 fixed speed pumps (2 duty and 1 standby), 60 hp each
- Forest Lawn Reservoir - 2 existing tanks, 100,000 gallons each
- Spadra Landfill PS - 3 fixed speed pumps (2 duty and 1 standby), 30 hp each
- Spadra Landfill Reservoir - 800,000 gallon tank



Site No.	Site Name		
Existing Customers			
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Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
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E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
Potential Customers - Cemeteries			
7	Forest Lawn Mortuary	9	Pomona Cemetery
8	Holy Cross Cemetery		
Potential Customers - Homeowners Associations			
10	Amcal Portofino Villas	15	Phillips Meadows
11	Country Pk Villas	16	Phillips Ranch (A - F)
12	Estates-Pomona Westland	17	Quail Creek Pomona
13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
20	Braun Linen Service	29	Pomona Fairplex
21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
37	Centennial Park	50	Mlk Jr Memorial Park
38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
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44	John F. Kennedy Park	57	Ralph Welch Park
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46	Kiwanis Park	59	Veterans Park
47	Lincoln Park	60	Washington Park
48	Madison Park	61	Westmont Park
49	Memorial Park	62	Willie White Park
Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
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67	Decker Elementary	86	Pomona Alternative (PAS)
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78	Lincoln Elementary	97	Washington Elementary
79	Lopez Elementary	98	Westmont Elementary
80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

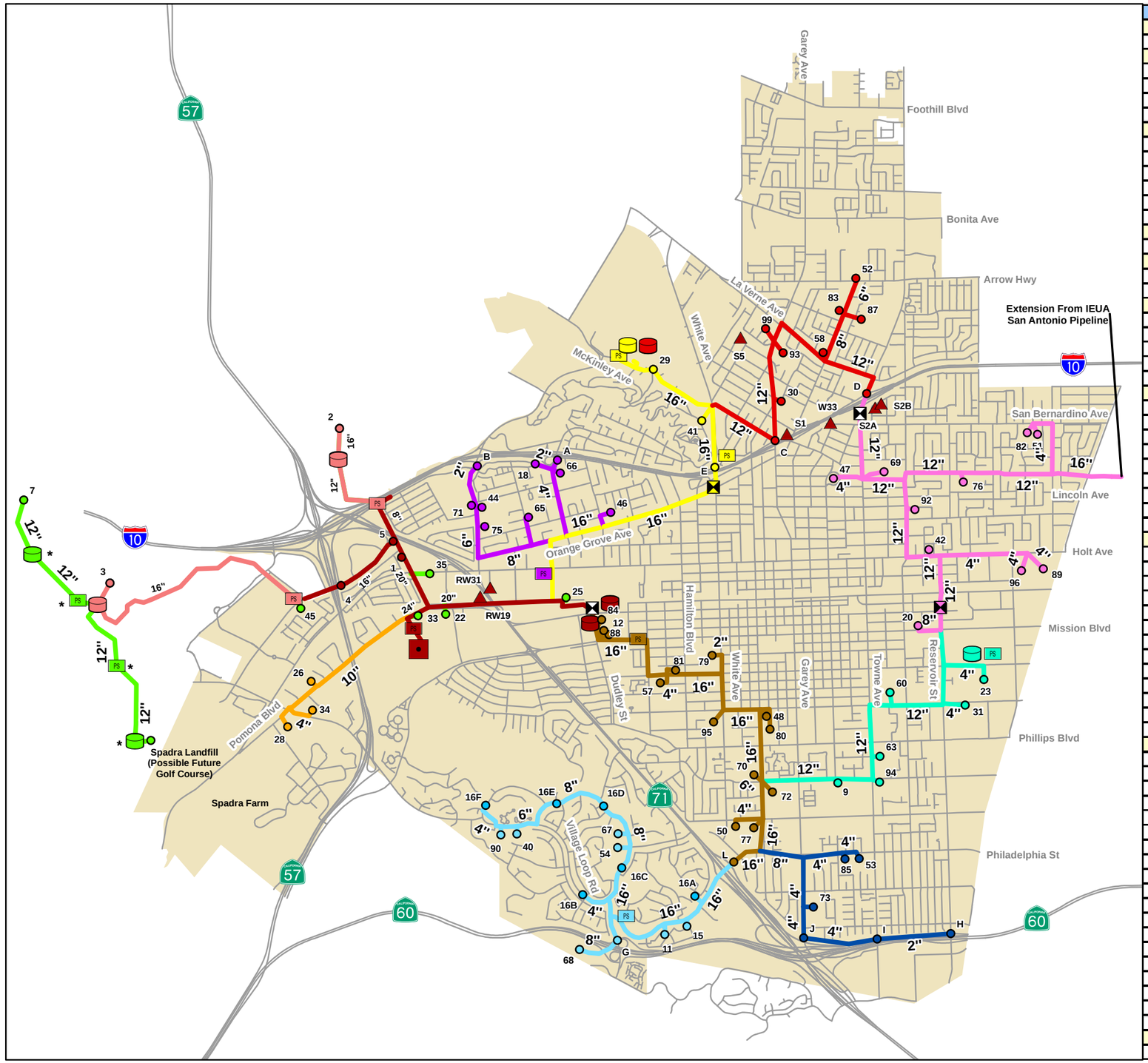
Legend

- Water Reclamation Plant
- Non-Potable Well
- Booster Pump Station
- Reservoir
- PRV
- Existing or Potential Recycled Water Customer
- Pipeline
- Bonelli Park (Not Maintained by City of Pomona)
- Cal Poly Pomona (Not Maintained or Financed by City of Pomona)
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5
- Zone 6
- Streets
- City Limits/Service Area

N

Feet
0 3,000 6,000

Figure 8.3
Potential System Zones
Recycled Water Master Plan
City of Pomona



Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
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D	I-10 & Towne	J	SR-71 & Garey
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Potential Customers - Cities			
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Potential Customers - Cemeteries			
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Potential Customers - Industrial/Commercial			
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Potential Customers - Parks			
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78	Lincoln Elementary	97	Washington Elementary
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80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Well
- Booster Pump Station
- Reservoir
- PRV
- Existing or Potential Recycled Water Customer
- Pipeline
- Existing System: Pomona
- Existing System: Bonelli Park & Cal Poly (Not Maintained by City of Pomona)
- Segment 1*
- Segment 2
- Segment 3
- Segment 4A
- Segment 4B
- Segment 5
- Segment 6
- Segment 7
- Segment 8
- Segment 9
- Streets
- City Limits/Service Area

Feet
0 3,000 6,000

Figure 8.4
Pipe Sizes
Recycled Water Master Plan
City of Pomona

Note: *Potential Bonelli Park & Cal Poly System Expansions are not maintained or financed by the City of Pomona.

The existing Cal Poly recycled water PS has the capacity to supply the required flow to the Cal Poly recycled water system. Within the Cal Poly system, pump stations are recommended for supplying both Forest Lawn and Spadra Landfill because of elevation differences. A new reservoir is recommended for Spadra Landfill because the existing Cal Poly reservoir does not have sufficient capacity to supply Spadra Landfill during peak seasonal demand. A separate reservoir is also recommended for Cal Poly to serve Forest Lawn because the reservoir will aid in the operational control of the downstream pump station. In addition, Forest Lawn has indicated that two vacant 100,000-gallon reservoirs on its site could be converted to recycled water use. However, the existing 1.9 MG Cal Poly Reservoir will still act as the main reservoir for Forest Lawn.

The adequacy of existing facilities and the sizing of new recommended facilities were based on the system control assumptions listed in Table 8.2.

Table 8.2 Segment 1 - Cal Poly System Control Assumptions
Recycled Water Master Plan
City of Pomona

Asset	Switch On	Off	Comments
Cal Poly Recycled Water PS	1.9 MG reservoir is half full	1.9 MG reservoir is full	Pumps could be set to switch on earlier in order to ensure adequate supply
Forest Lawn Booster PS	0.2 MG Forest Lawn storage is empty	0.2 MG storage is full	Control set to maximize storage
Spadra Landfill Booster PS	0.8 MG Golf Course Storage is empty	0.8 MG storage is full	Control set to maximize storage

The required facilities and the approximate cost for upgrading the Cal Poly system are summarized in Table 8.3.

Table 8.3 Segment 1 Project Cost Estimate - Cal Poly/Forest Lawn Recycled Water Master Plan City of Pomona

Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Size (in)	Unit Cost	Total Cost
Spadra Landfill (1)	0.8	413	5,000	12	$230	$1,150,000
Forest Lawn Transmission Line (2)	0.63	330	5,000	12	$230	$1,150,000
Total Demand	**1.43**	**743**			**Pipeline Total**	**$2,300,000**
Forest Lawn Reservoir (2 tanks rehabilitated at $1.25/gal) (2)						$50,000
Spadra Landfill Reservoir (800,000 gals at $1.25/gal) (1)						$1,000,000
Forest Lawn Pump Station (3 pumps 60 hp each at $5,000/hp) (2)						$900,000
Spadra Landfill PS (3 pumps 30 hp each at $6,500/hp) (1)						$585,000
					Construction Cost	$4,835,000
					30% Contingency	$1,451,000
					Subtotal	***$6,286,000***
					Construction Management	$629,000
					Engineering and Legal	$1,572,000
					Capital Cost	**$8,487,000**
					30-Year Payment	$616,571
					Cost/ace-ft	**$830**

Notes:
(1) Cost to be paid by Cal Poly Pomona.
(2) Cost to be paid by Forest Lawn.

8.3.1.3 Customers Adjacent to the Existing System

Segment 1 also includes connecting customers directly adjacent to the existing system. Potential customer connections and the associated costs are shown in Table 8.4.

Table 8.4 Segment 1 - Project Cost Estimate - Additional Customers
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost [1]
22	Brown Grandstands Inc	0.01	10	100	4	$130	$19,000
45	Kellogg Park	0.04	23	300	4	$130	$45,000
33	Robertson's Ready Mix [2][3]	0.09	62	200	4	$130	-
35	W.R. Meadows Inc.	0.04	27	700	4	$130	$97,000
25	Ecoplast Corp	0.00	3	100	4	$130	$19,000
	Total Demand	**0.19**	**125**			**Pipeline Total**	**$180,000**
						30% Contingency	$54,000
						Subtotal	***$234,000***
						Construction Management	$24,000
						Engineering and Legal	$59,000
						Capital Cost	**$317,000**
						30-Year Payment	$23,030
						Cost/acre-ft	**$368[4]**

Notes:

(1) Includes connection cost of $6,000/connection.

(2) City of Pomona has added Robertson's Ready Mix, and received approval from County of Los Angeles Department of Public Health.

(3) Cost not included in the total since this cost has already been allocated in the City's 2008-2009 fiscal year budget.

(4) Based on a demand of 0.1 mgd (excludes the demand from Robertson's Ready Mix - see footnote 3).

8.3.1.4 Summary

Hydraulic modeling shows that the City's distribution system has adequate capacity to accommodate the increased demands from both existing customers and new Segment 1 customer connections. The demand weighted average for implementing Segment 1 is $763/ac-ft. This cost is based on the full cost per acre-foot for implementing all parts of Segment 1 (presented in Table 8.3 and Table 8.4).

8.3.2 Segment 2 - Lanterman Hospital Extension

Segment 2 involves extending the existing system to serve the anchor customer Lanterman Hospital. Due to current fiscal constraints, Lanterman Hospital (owned by the State of California) is unable to coordinate the necessary improvements for a recycled water connection. As a result, this segment is given low priority in relation to other feasible segments. The possible scope of improvements may include the rehabilitation of an existing 12-inch diameter main along Pomona Boulevard that could be used for transmission of recycled water to the site. The cost for rehabilitating an existing 12-inch diameter main is estimated at $115 per foot. If the rehabilitation of the 12-inch diameter is not possible in the future, a new main would be required. It should be noted that the cost is approximately half the cost of installing new 12-inch diameter main, based on the unit cost assumptions established for this RWMP. This new main would require jack and boring underneath the railroad tracks that run parallel to the PWRP. The new main would extend from existing pipelines at the PWRP, and parallel the existing main (proposed for rehabilitation) in Pomona Boulevard. Potential customer connections and the associated costs are shown in Table 8.5.

Table 8.5 Segment 2 - Summary and Cost
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost [1]
34	Structure Composites	0.03	23	100	4	$130	$19,000
26	Gemini Aluminum Corporation	0.02	13	300	4	$130	$45,000
28	Lanterman Hospital	0.14	71	200	4	$130	- [2]
	Rehabilitation of 12-inch diameter pipe			5,500	10	$115	$632,500 [3]
	Railroad Crossing			200		$250	$50,000
	Total Demand	**0.19**	**107**			**Pipeline Total**	**$746,500**
						30% Contingency	$224,000
						Subtotal	***$970,500***
						Construction Management	$98,000
						Engineering and Legal	$243,000
						Capital Cost	**$1,311,500** [4]
						30-Year Payment	$95,279
						Cost/acre-ft	**$2,655** [5][6]

Notes:
(1) Includes connection cost of $6,000/connection.
(2) Cost not included due to the inability of this customer to fund the necessary onsite improvements. Funding is not available due to current State budget constraints.
(3) Based on pipeline rehabilitation. The cost of new 12-inch main is approximately $1,265,000.
(4) The estimated Capital Cost with a new 12-inch main would be $2,422,000.
(5) Based on a demand of 0.05 mgd (excludes. the demand from Lanterman Hospital - see footnote 2) and rehabilitation of an existing 12-inch main for recycled water transmission
(6) Cost per acre-foot with a new 12-inch main would be $4,903/ac-ft.

Hydraulic modeling verified that the City's existing system is capable of adequate performance under increased demands from both Segments 1 and 2. The cost for implementing Segment 2 is about $2,655/ac-ft; however, the cost could be $4,903/ac-ft if a new main along Pomona Boulevard is required as discussed above

8.3.3 Segment 3 - Fairplex/Ganesha Park Expansion

For this segment, Ganesha Park and the Fairplex act as anchor customers to expand the recycled water distribution to the northern part of the City. The City must install VFDs at the existing PWRP pump station to make this system operational, since this segment will require any supply flow that is currently not utilized due to fixed speed pump operation. As shown in Figure 8.2, the following additional facilities are recommended for this segment:

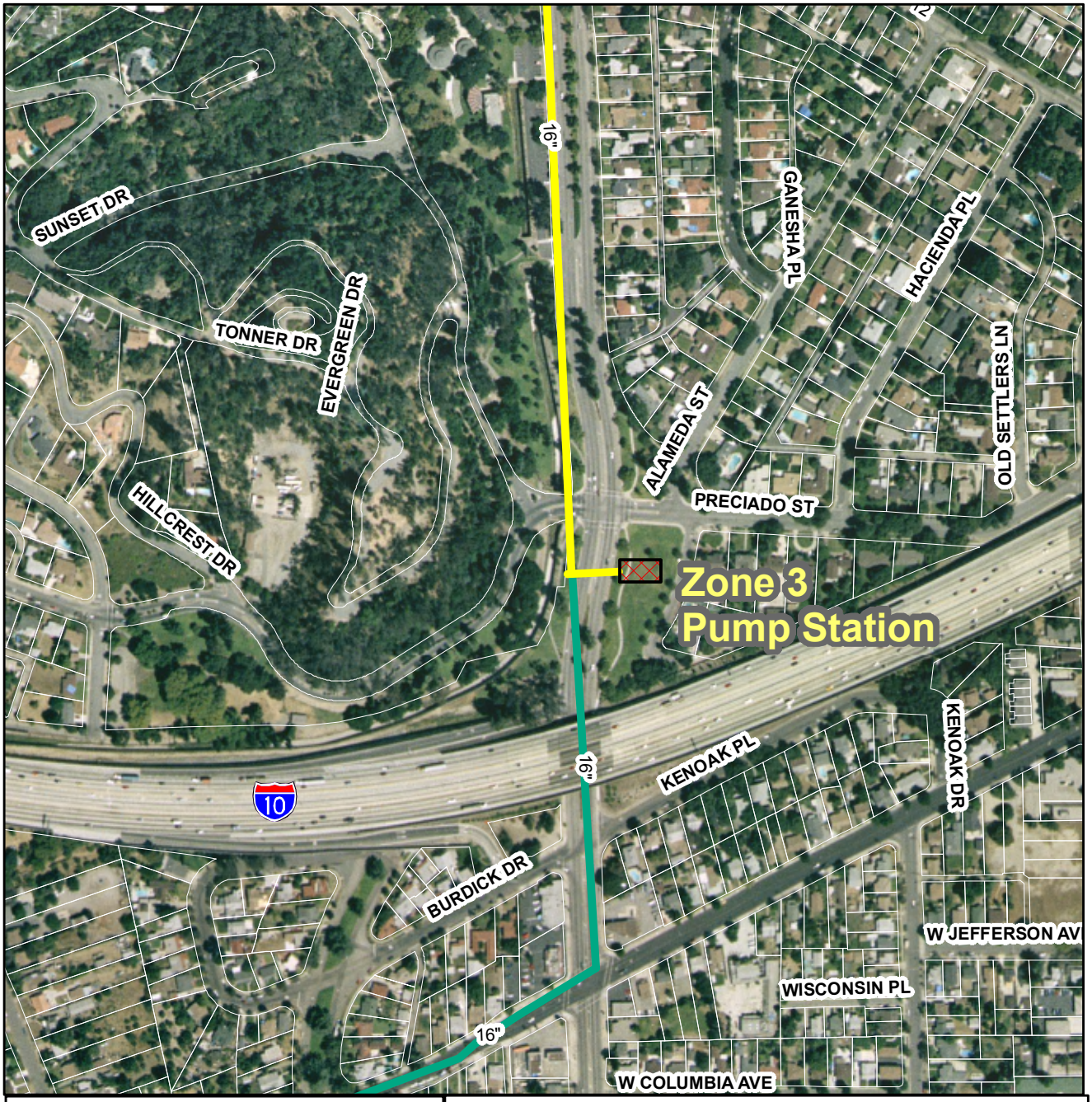
- Zone 3 Pump Station - 3 fixed speed pumps (2 duty and 1 standby), 40 hp each
- Zone 2 Pump Station - 3 fixed speed pumps (3 duty), 25 hp each
- North Reservoir 1 - 600,000 gallon tank
- North Booster Pump Station - 3 VFD pumps (2 duty and 1 standby), 30 hp each
- Zone 3 PRV, 16-inch set at 35 psi

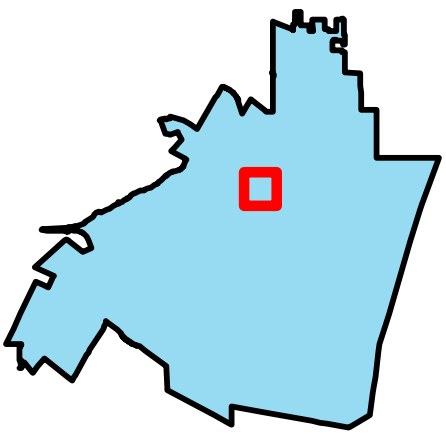
As shown in Figure 8.3, this segment would be located in Pressure Zone 3. This segment requires that the Zone 3 Pump Station supply North Reservoir 1. North Reservoir 1 and the North Booster Pump Station are required to pressurize Zone 3 during distribution periods since Zone 3 is isolated from the existing system by Zone 2. Figure 8.5 and Figure 8.6 show proposed locations for these new facilities. Location of the Zone 2 PS is discussed for Segment 4A. The proposed location for the Zone 3 PS is on City owned property; however, the proposed location of the North Reservoir and Booster PS is located on Fairplex property that is potentially available according to the Fairplex, The purpose of these figures is only to illustrate the approximate location of the future facility sites that would work well based on ground elevations and distribution system layout.

Table 8.6 lists the system control assumptions used for sizing the facilities in Segment 3.

Table 8.6 Segment 3 - (Zone 3) System Control Assumptions
Recycled Water Master Plan
City of Pomona

Asset	Switch On	Off	Comments
Zone 3 PS	9:00 a.m. everyday	North Reservoir is full	Should not be running when the North Reservoir Pump Station is operating
Zone 2 PS	9:00 a.m. everyday	North Reservoir is full	PS is primarily for supplying Zone 2 with flow at night, but must also run during the day so there is adequate suction pressure at the Zone 3 PS.
North Booster PS	9:00 p.m. (Start of Irrigation Demand)	5:00 a.m. everyday (End of Irrigation Demand)	Should not be running when the Zone 3 Pump Station is operating





Legend

- Zone 2 Pipelines
- Zone 3 Pipelines
- Pump Station Footprint

N

0 100 200 400 Feet

Figure 8.5
Proposed Zone 3 Booster Pump Station

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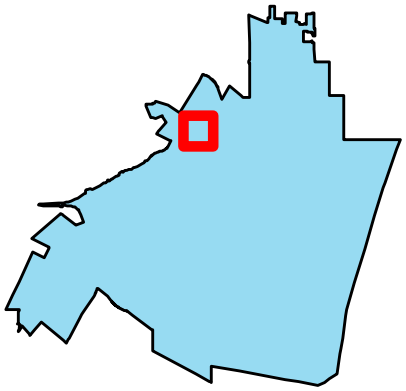

Legend

Zone 3 Pipelines

Proposed Reservoir Location

Proposed Pump Station Location

N

0 100 200 400 Feet

Figure 8.6

August 2009 **Proposed North Reservoir & Booster Pump Station**

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A summary of the required facilities and the approximate costs for Segment 3 is shown in Table 8.7.

Table 8.7 Segment 3 - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost [(1)]
29	Pomona Fairplex	0.19	103	100	12	$230	$29,000
41	Ganesha Park	0.33	171	200	12	$230	$52,000
E	10 & White	0.02	11	0	6	$150	$6,000
	New Transmission Line			13,900	16	$290	$4,031,000
	1 New PRV						$50,000
	Total Demand	**0.54**	**282**			**Pipeline Total**	**$4,168,000**
						North Reservoir 1 (600,000 gal tank at $1.25/gal)	$750,000
						North Booster PS (3 pumps, 2 duty 1 standby, 30 hp each at $6,500/hp)	$585,000
						Zone 2 PS (3 pumps, 2 duty 1 standby, 40 hp each at $6,500/hp)	$487,500
						Zone 3 PS (3 pumps, 3 duty 1 standby, 40 hp each at $6,500/hp)	$780,000
						Construction Cost	**$6,770,500**
						30% Contingency	$2,032,000
						Subtotal	***$8,802,500***
						Construction Management	$881,000
						Engineering and Legal	$2,201,000
						Capital Cost	**$11,884,500**
						30-Year Payment	$863,396
						Cost/acre-ft	**$3,060**

Note:
(1) Includes connection cost of $6,000/connection.

8.3.3.1 Summary

Hydraulic modeling verified that the City's existing system is capable of adequate performance under increased demands from Segments 1, 2, and 3. The cost for implementing Segment 3 is about $3,060/ac-ft.

8.3.4 Segment 4A - North Extension

Segment 4A is an expansion of the existing system to the area immediately north of the existing system. For operation of this segment, the City must install VFDs at the existing PWRP pump station since this segment will require any supply flow that is currently not utilized due to fixed speed pump operation.

As shown in Figure 8.2, the following additional facilities are required for this segment:

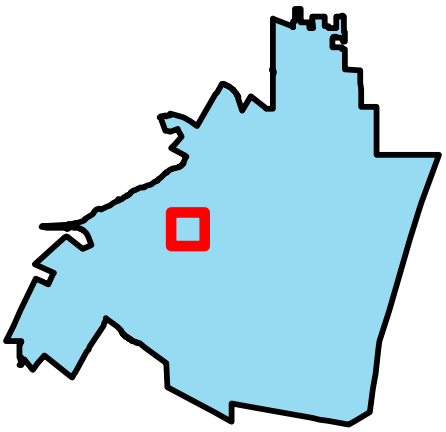
- Zone 2 Pump Station - 3 VFD pumps (2 duty and 1 standby), 15 hp each
- Zone 3 Check Valve (If Segment 3 has been implemented)

As shown in Figure 8.3, this segment would be located in Pressure Zone 2. This segment requires the Zone 2 Pump Station to supply the segment with recycled water from Zone 1. Figure 8.7 shows a proposed location for the Zone 2 PS. This proposed location is not on a City owned parcel, as a suitable City owned parcel in the vicinity of the proposed site was not identified at the time of the preparation of this RWMP. The facility location shown on this figure is therefore subject to change. The purpose of this figure is only to illustrate the approximate location of a future facility site that would work well based on ground elevations and distribution system layout.

The reservoirs of the existing City system (Zone 1) have sufficient capacity and an additional reservoir is therefore not necessary for this segment. Zone 2 is isolated from Zone 3 by a check valve since Zone 3 is at a much higher pressure during operation. Table 8.8 lists the system control assumptions used for sizing Segment 4A facilities.

Table 8.8 Segment 4A - (Zone 2) System Control Assumptions
Recycled Water Master Plan
City of Pomona

Asset	Switch On	Off	Comments
Zone 2 PS	9:00 p.m. (Start of Irrigation Demand)	5:00 a.m. (End of Irrigation Demand)	Should be set to start when irrigation occurs



Legend

- Zone 1 Pipelines
- Zone 2 Pipelines
- Pump Station Footprint

N

0 100 200 400 Feet

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Figure 8.7
Proposed Zone 2 Booster Pump Station

A summary of the required facilities and the approximate costs for Segment 4A are shown in Table 8.9.

Table 8.9 Segment 4A - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost [(1)]
75	John Marshall Middle	0.05	25	200	4	$130	$32,000
44	John F. Kennedy Park	0.04	23	200	4	$130	$32,000
71	Ganesha Senior High	0.06	32	200	4	$130	$32,000
B	10 & Fairplex	0.02	11	1,500	2	$130	$201,000
65	Arroyo Elementary	0.02	10	1,200	4	$130	$162,000
	New Transmission Line			1,900	6	$150	$285,000
	New Transmission Line			2,677	8	$180	$482,000
18	Village Gate	0.00	1	800	2	$130	$110,000
A	10 & Dudley	0.02	11	900	4	$130	$123,000
66	Cortez Elementary	0.01	7	500	4	$130	$71,000
46	Kiwanis Park	0.03	14	815	6	$150	$129,000
	New Transmission Line			2,450	4	$130	$319,000
	Total Demand	**0.23**	**135**			**Pipeline Total**	**$1,978,000**
						Zone 2 PS (3 pumps, 2 duty 1 standby, 15 hp each at $6,500/hp)	**$292,500**
						Construction Cost	**$2,271,000**
						30% Contingency	$682,000
						Subtotal	***$2,953,000***
						Construction Management	$296,000
						Engineering and Legal	$739,000
						Capital Cost	**$3,988,000**
						30-Year Payment	$289,724
						Cost/acre-ft	**$2,144**

Note:
(1) Includes connection cost of $6,000/connection.

8.3.4.1 Summary

Hydraulic modeling verified that the City's existing system is capable of adequate performance under increased demands from Segments 1, 2, 3, and 4A. The cost for implementing Segment 4A is about $2,144/ac-ft.

8.3.5 Segment 4B - Park West Extension

Segment 4B extends the existing system from Segment 3 to supply customers between Ganesha Park and Park West High School. For operation of this segment, the City must install VFDs at the existing PWRP pump station since this segment will require any supply flow that is currently not utilized due to fixed speed pump operation.

The following additional facilities are required for this segment:

- North Reservoir 2 - 500,000 gallon tank
- Two additional pumps at North Booster PS - 2 VFD pumps, 30 hp each (2 duty, standby provided by standby pump at North Reservoir PS from Segment 3)

The segment is essentially an expansion of Zone 3. For this reason, an additional reservoir is required because recycled water is transferred to the reservoirs during the day by the Zone 3 PS for nighttime distribution by the North Booster PS. The Zone 3 PS does not need to be upgraded since it will be adequately sized in Segment 3. A summary of Zone 3 system control assumptions is provided in Table 8.6.

A summary of the required facilities and the approximate costs for Segment 4B is shown in Table 8.10.

Table 8.10 Segment 4B - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost [(1)]
C	10 & Garey	0.02	11	0	4	$130	$6,000
30	Pomona Valley Hospital MC	0.03	14	200	4	$130	$32,000
93	San Jose Elementary	0.02	12	550	4	$130	$78,000
99	Yorba Elementary	0.02	11	550	4	$130	$78,000
D	10 & Towne	0.02	11	0	4	$130	$6,000
	New Transmission Line			11,500	12	$230	$2,651,000
58	Ted Greene Park	0.02	12	200	4	$130	$32,000
83	Palomares Middle	0.10	52	200	4	$130	$32,000
52	Palomares Park	0.10	50	1,400	6	$150	$216,000
87	Pomona Senior High	0.11	57	700	4	$130	$97,000
	New Transmission Line			1,828	8	$180	$330,000
	Total Demand	**0.44**	**231**			**Pipeline Total**	**$3,558,000**
						Reservoir Cost (500,000 gal tank at $1.25/gal)	$625,000
						Additional Pumps at North Booster PS (2 pumps 30 hp each $3,000/hp)	$180,000
						Construction Cost	$4,363,000
						30% Contingency	$1,309,000
						Subtotal	***$5,672,000***
						Construction Management	$568,000
						Engineering and Legal	$1,418,000
						Capital Cost	**$7,658,000**
						30-Year Payment	$556,345
						Cost/acre-ft	**$2,409**

Note:
(1) Includes connection cost of $6,000/connection.

8.3.5.1 Summary

Hydraulic modeling verified that the City's existing system is capable of adequate performance under increased demands from Segments 1, 2, 3, 4A, and 4B assuming that demand is not saturated from the previous segments or that the PWRP can provide sufficient supplies. The cost for implementing Segment 4B is about $2,409/ac-ft.

8.3.6 Segment 5 - East Side Expansion

Using the IEUA as a supply source, this segment extends recycled water service to the east side of the City. Braun Linens acts as an anchor customer for the segment. The following assumptions were made for the IEUA supply:

- IEUA recycled water supply is 1.3 mgd (1,500 ac-ft/yr)
- Recycled water is delivered at a constant flow rate from the IEUA
- Delivery pressure at the end of IEUA's San Antonio pipeline, 2.5 miles east from the City boundary, is 70 psi

As shown in Figure 8.2, the following facilities are required for this segment:

- Zone 4 Pressure Reducing Valve - This valve is needed to facilitate the connection between Zones 4 and 5. The valve would be 12-inch set at 40 psi.
- Interconnection Pressure Reducing Valve - This valve would be between Zones 3 and 4. The pressure in Zone 3 is higher than Zone 4, so the valve reduces the pressure, allowing the transfer of recycled water from Zone 3 to Zone 4.
- Extension of the IEUA San Antonio Pipeline to the City boundary.

As shown in Figure 8.3, most of the segment would be located in Pressure Zone 4 except for Braun Linens, which is located in Zone 5. Table 8.11 summarizes the segment and the associated costs. The major cost associated with this segment is the over 2.5 miles of 16-inch diameter pipe required to connect IEUA's San Antonio pipeline to the City.

Table 8.11 Segment 5 - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost [(1)]
51	Montvue Park	0.02	13	3000	4	$130	$396,000
82	Montvue Elementary	0.02	8	0	4	$130	$6,000
76	Kingsley Elementary	0.03	16	150	4	$130	$26,000
92	San Antonio Elementary	0.03	14	150	4	$130	$26,000
69	Emerson Middle	0.04	22	150	4	$130	$26,000
47	Lincoln Park	0.02	9	1068	4	$130	$145,000
42	Garfield Park	0.02	9	150	4	$130	$26,000
89	Pueblo Elementary	0.03	17	3000	4	$130	$396,000
96	Village Academy (HS)	0.00	1	0	4	$130	$6,000
20	Braun Linen Service	0.45	315	986	8	$180	$184,000
	New Transmission Line			16,500	12	$230	$3,795,000
	New Transmission Line			14,000	16	$290	$4,060,000
	New PRV					$50,000	$50,000
	New PRV					$50,000	$50,000
	Total Demand	**0.66**	**423**			**Pipeline Total**	**$9,192,000**
						30% Contingency	$2,758,000
						Subtotal	***$11,950,000***
						Construction Management	$1,195,000
						Engineering and Legal	$2,988,000
						Capital Cost	**$16,133,000**
						30-Year Payment	$1,172,045
						Cost/acre-ft	**$2,773**

Note:
(1) Includes connection cost of $6,000.

8.3.6.1 Summary

Hydraulic modeling verified that the existing pressure from the IEUA San Antonio Line is sufficient for pressurizing Segment 5. The cost for implementing Segment 5 is about $2,773/ac-ft. The City could discuss cost sharing with IEUA for the cost of the pipeline that extends the San Antonio pipeline to the City boundary. This would lower the overall segment cost.

8.3.7 Segment 6 - East Side Extension to Garey High

This segment maximizes use of the IEUA supply by extending the initial east side extension to Garey Senior High School. For this segment, Garey High School, Pomona Cemetery, and Freemont Middle School act as anchor customers. The following assumptions were made for the IEUA supply:

- IEUA recycled water supply is 1.3 mgd (1,500 ac-ft/yr)
- Recycled water is delivered at constant rate from the IEUA
- Delivery pressure at the end of IEUA's San Antonio pipeline, 2.5 miles east from the City boundary, is 70 psi

As shown in Figure 8.2, the following additional facilities are required for this segment:

- East Reservoir - 600,000 gallon tank
- East Booster Pump Station - 3 VFD pumps (2 duty and 1 standby), 25 hp each

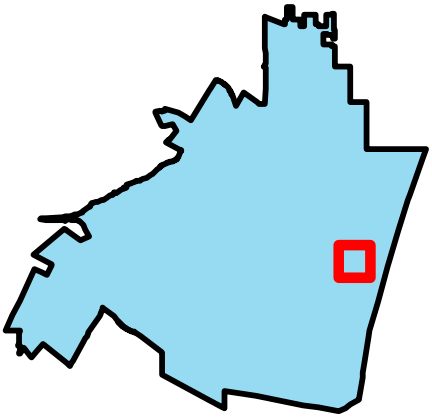
As shown in Figure 8.3, the segment is entirely located in Pressure Zone 5. This segment will increase the amount of nighttime irrigation. Since the IEUA is assumed to supply recycled water at a constant flow rate throughout the day, a reservoir and pump station are required to store daytime flow for nighttime distribution.

Figure 8.8 shows a proposed location for the East Reservoir and East Booster Pump Station. This proposed location on a City owned parcel. The purpose of this figure is to illustrate the approximate location of this future facility site that would work well based on ground elevations and distribution system layout.

Table 8.12 lists the system control assumptions used to size the East Booster PS.

Table 8.12 Segment 6 - (Zone 5) System Control Assumptions
Recycled Water Master Plan
City of Pomona

Asset	Switch On	Off	Comments
East Booster PS	Start of Irrigation Demand	End of Irrigation Demand	Should be timed to start when irrigation occurs



Legend

- Zone 5 Pipelines
- Reservoir
- Pump Station Footprint

N

0 100 200 400 Feet

Figure 8.8
Proposed East Booster Pump Station & Reservoir

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A summary of the required facilities and the approximate costs for Segment 6 is shown in Table 8.13.

Table 8.13 Segment 6 - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost [1]
23	California Acrylic Industries	0.04	31	1,930	4	$130	$258,000
31	Recycled Wood Products	0.04	26	804	4	$130	$111,000
60	Washington Park	0.08	40	200	4	$130	$32,000
63	Alcott Elementary	0.02	12	200	4	$130	$32,000
94	Simons Middle	0.05	26	200	4	$130	$32,000
9	Pomona Cemetery	0.19	100	200	8	$180	$42,000
	New Transmission Line			12,000	12	$230	$2,760,000
	Total Demand	**0.42**	**235**			**Pipeline Total**	**$3,267,000**
						Reservoir (600,000 gal tank at $1.25/gal)	$750,000
						Pump Station (3 pumps, 25 hp each at $6,500/hp)	$487,500
						Construction Cost	$4,504,500
						30% Contingency	$1,352,000
						Subtotal	***$5,856,500***
						Construction Management	$586,000
						Engineering and Legal	$1,465,000
						Capital Cost	**$7,907,500**
						30-Year Payment	$574,471
						Cost/acre-ft	**$2,449**

Note:
(1) Includes connection cost of $6,000.

8.3.7.1 Summary

Hydraulic modeling verified that the 1.3 mgd flow rate from the IEUA is sufficient to meet the demand from Segments 5 and 6 provided that a reservoir and pump station are installed. The cost for implementing Segment 6 is about $2,449/ac-ft.

8.3.8 Segment 7 - East Side/Existing System Connection

Segment 7 extends the existing system from the existing reservoirs to supply customers between the existing system and the Phillips Ranch area. Implementation of this segment assumes that the City foregoes Segments 3, 4A, and 4B in favor of Segments 7, 8, and 9. This variation in segment preference is due to insufficient supply solely from PWRP for service to all identified segments. For operation of this segment, the City must install VFDs at the existing PWRP pump station since this segment will require any supply flow that is currently not utilized due to fixed speed pump operation.

The following facilities are required for this segment:

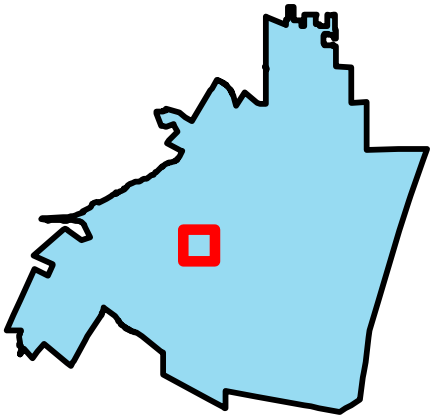
- Zone 5 PS - 3 VFD pumps (2 duty and 1 standby), 30 hp each

As shown in Figure 8.3, this segment would be located in Pressure Zone 5. This segment requires the Zone 5 Pump Station to supply the segment with recycled water from Zone 1. Figure 8.9 shows a proposed location for the Zone 5 PS. This proposed location is not on a City owned parcel, as a suitable City owned parcel due to a lack of City owned properties in the identified area. The facility location shown on this figure is therefore subject to change. The purpose of this figure is only to illustrate the approximate location of a future facility site that would work well based on ground elevations and distribution system layout.

The reservoirs of the existing City system (Zone 1) have sufficient capacity making an additional reservoir for this segment unnecessary. Zone 5 is isolated from Zone 1 by a pressure reducing valve since Zone 5 is at a much higher pressure than Zone 1 during operation. Table 8.14 lists the system control assumptions used for sizing Segment 7 facilities. If the Zone 5 PS is not installed, then only three customers (IDs 88, 12, and 84) could be served from Segment 7. These customers are identified by a footnote in Table 8.15.

Table 8.14 Segment 7 - (Zone 5) System Control Assumptions
Recycled Water Master Plan
City of Pomona

Asset	Switch On	Off	Comments
Zone 5 PS	9:00 p.m. (Start of Irrigation Demand)	5:00 a.m. (End of Irrigation Demand)	Should be set to start when irrigation occurs



Legend

- Zone 1 Pipelines
- Zone 5 Pipelines
- Pump Station Footprint

N

0 100 200 400 Feet

Figure 8.9
Proposed Zone 5 Booster Pump Station

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A summary of the required facilities and the approximate costs for Segment 7 are shown below in Table 8.15.

Table 8.15 Segment 7 - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost [1]
80	Madison Elementary	0.02	8	1,000	4	$130	$136,000
48	Madison Park	0.02	11	200	4	$130	$32,000
95	Vejar Elementary	0.02	13	552	4	$130	$78,000
79	Lopez Elementary	0.01	7	1,000	2	$130	$136,000
81	Mendoza Elementary	0.01	5	503	new #	$130	$39,000
57	Ralph Welch Park	0.05	29	522	4	$130	$39,000
88	Pomona Vocational[2]	0.01	4	385	4	$130	$45,000
84	Park West High[2]	0.01	3	761	4	$130	$29,000
12	Estates-Pomona Westland[2]	0.00	1	433	4	$130	$32,000
72	Garey Senior High	0.11	56	100	4	$130	$19,000
70	Fremont Middle	0.07	36	100	4	$130	$19,000
50	MLK Jr. Memorial Park	0.03	14	1,200	4	$130	$162,000
77	Lexington Elementary	0.02	11	450	4	$130	$65,000
L	71 & Rio Rancho Rd.	0.02	11	433	4	$130	$63,000
	New Transmission Line			14,500	12	$230	$4,205,000
	Total Demand	**0.40**	**210**			**Pipeline Total**	**$5,089,000**
	Zone 5 P.S. (3 pumps, 2 duty 1 standby, 30 hp each at 6,500/hp)						$585,000
						Construction Cost	$5,674,000
						30% Contingency	$1,703,000
						Subtotal	***$7,377,000***
						Construction Management	$738,000
						Engineering and Legal	$1,845,000
						Capital Cost	**$9,960,000**
						30-Year Payment	$723,583
						Cost/acre-ft	**$3,444**

Note:

(1) Includes connection cost of $6,000/connection.

(2) Customers that could be served without the Zone 5 Pump Station.

8.3.8.1 Summary

Implementation of this segment assumes that the City foregoes Segments 3, 4A, and 4B in favor of Segments 7, 8, and 9, because the City does not have sufficient supply to implement all segments. The cost of the total segment is about $3,444/ac-ft.

8.3.9 Segment 8 - East Side Extension to Route 60

Segment 8 extends service from Segment 7 to additional customers adjacent to State Route (SR) 60. Implementation of this segment assumes that the City foregoes Segments 3, 4A, and 4B in favor of Segments 7, 8, and 9, because the City does not have sufficient supply to implement all segments. For operation of this segment, the City must install VFDs at the existing PWRP pump station since this segment will require any supply flow that is currently not utilized due to fixed speed pump operation.

The following facilities are required for this segment:

- Zone 5 PS - 1 additional VFD pump 30 hp (1 duty, standby provided by Segment 7 standby pump)

The segment is essentially an expansion of Zone 5. For this reason, an additional pump is required because this segment increases demand. A summary of how Zone 5 PS operates is presented in Table 8.11.

A summary of the required facilities and the approximate costs for Segment 8 is shown in Table 8.16.

Table 8.16 Segment 8 - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost [(1)]
85	Philadelphia Elementary	0.02	10	300	4	$130	$45,000
53	Philadelphia Park	0.02	13	600	4	$130	$84,000
73	Garey Village (HS)	0.03	14	350	4	$130	$52,000
J	SR-71 & Garey Av	0.02	11	0	4	$130	$6,000
I	SR-60 & Towne Av	0.02	11	2,600	4	$130	$344,000
H	SR-60 & Reservoir Rd.	0.02	11	2,600	2	$130	$344,000
	New Transmission Line			4,300	4	$130	$559,000
	New Transmission Line			1,600	8	$180	$288,000
	Total Demand	**0.14**	**71**			**Pipeline Total**	**$1,722,000**
						Additional Pump at East Booster Pump Station (1 pump, 1 duty, 30 hp at $3,000/hp)	$90,000
						Construction Cost	$1,812,000
						30% Contingency	$544,000
						Subtotal	***$2,356,000***
						Construction Management	$236,000
						Engineering and Legal	$589,000
						Capital Cost	**$3,181,000**
						30-Year Payment	$231,096
						Cost/acre-ft	**$3,253**

Note:
(1) Includes connection cost of $6,000/connection.

8.3.9.1 Summary

Implementation of this segment assumes that the City foregoes Segments 3, 4A, and 4B in favor of Segments 7 and 8, because the City does not have sufficient supply to implement all Segments. The estimated cost is $3,253/ac-ft.

8.3.10 Segment 9 - Phillips Ranch Extension

This segment extends the recycled water system from Segment 7 to the customers in the Phillips Ranch area. Implementation of this segment assumes that the City foregoes Segments 3, 4A, and 4B in favor of Segments 7, 8, and 9, because the City does not have sufficient supply to implement all segments. For operation of this segment, the City must install VFDs at the existing PWRP pump station since this segment will require any supply flow that is currently not utilized due to fixed speed pump operation.

The following facilities are required for this segment:

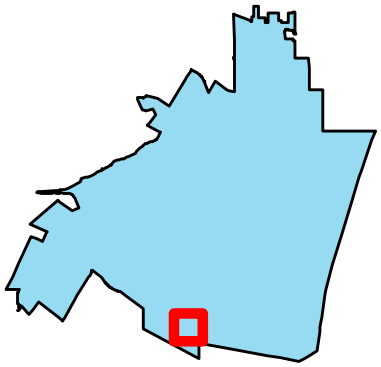
- Zone 6 PS - 4 VFD pumps (3 duty and 1 standby), 40 hp each
- Zone 5 PS - 3 additional 30 hp VFD pump (3 duty, standby provided by existing standby from Segment 7)

As shown in Figure 8.3, this segment would be located in Pressure Zones 5 and 6. This segment requires the Zone 5 Pump Station to supply the segment with recycled water from Zone 1. Since demand is increasing, an additional pump is required at the Zone 5 PS. In additional, a new Zone 6 PS is needed to supply Zone 6 with recycled water. Figure 8.10 shows a proposed location for the Zone 6 PS. This proposed location is not on a City owned parcel, as a suitable City owned parcel in the vicinity of the proposed site was not identified at the time of the preparation of this RWMP. The facility location shown on this figure is therefore subject to change. The purpose of this figure is only to illustrate the approximate location of a future facility site that would work well based on ground elevations and distribution system layout.

The reservoirs of the existing City system (Zone 1) have sufficient capacity making an additional reservoir for this segment unnecessary. The system control assumptions used for sizing Segment 9 facilities are presented in Table 8.17.

Table 8.17 Segment 9 - (Zone 6) System Control Assumptions
Recycled Water Master Plan
City of Pomona

Asset	Switch On	Off	Comments
Zone 6 PS	9:00 p.m. (Start of Irrigation Demand)	5:00 a.m. (End of Irrigation Demand)	Should be set to start when irrigation occurs



Legend

- Zone 5 Pipelines
- Zone 6 Pipelines
- Pump Station Footprint

N

0 100 200 400 Feet

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Figure 8.10
Proposed Zone 6 Booster Pump Station

A summary of the required facilities and the approximate costs for Segment 9 are shown in Table 8.18.

Table 8.18 Segment 9 - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost [(1)]
11	Country Park Villas	0.01	3	300	4	$130	$45,000
15	Phillips Meadow	0.02	9	300	4	$130	$45,000
16a	Phillips Ranch - Rio Rancho Rd	0.07	38	200	4	$130	$32,000
G	60 & Phillips Ranch Rd	0.02	11	700	8	$180	$132,000
68	Diamond Ranch Senior High	0.23	120	700	8	$180	$132,000
	Hwy Cross - Jack and Bore			1,000		$250	$256,000
	New Transmission Line			5,600	16	$290	$1,624,000
16b	Phillips Ranch - Phillips Ranch Rd	0.09	47	900	4	$130	$123,000
16c	Phillips Ranch - Village L. Rd (1-20)	0.04	20	200	4	$130	$32,000
54	Phillips Ranch Park	0.03	14	200	4	$130	$32,000
67	Decker Elementary	0.03	16	200	4	$130	$32,000
16d	Phillips Ranch - Village L. Rd (30-70)	0.08	44	200	4	$130	$32,000
16e	Phillips Ranch - Village L. Rd (70-100)	0.07	38	200	4	$130	$32,000
	New Transmission Line			3,000	12	$230	$696,000
	New Transmission Line			5,000	8	$180	$900,000
16f	Phillips Ranch - Santa Clara & Trabuco Rd	0.05	25	200	4	$130	$32,000
40	Country Crossing Park	0.04	25	200	4	$130	$32,000
90	Ranch Hills Elementary	0.02	10	200	4	$130	$32,000
	New Transmission Line			2,000	6	$150	$300,000
	Total Demand	**0.80**	**419**			**Pipeline Total**	**$4,541,000**
	Zone 5 PS (3 additional pump, 3 duty, 30 hp at $6,500/hp)						$585,000
	Zone 6 PS (4 pump, 3 duty 1 standby, 40 hp at $5,000/hp)						$800,000
						Construction Cost	**$5,926,000**
						30% Contingency	$1,778,000
						Subtotal	***$7,704,000***
						Construction Management	$771,000
						Engineering and Legal	$1,926,000
						Capital Cost	**$10,401,000**
						30-Year Payment	$755,621
						Cost/acre-ft	**$1,804**

Note:
(1) Includes connection cost of $6,000/connection.

8.3.10.1 Summary

Implementation of this segment assumes that the City foregoes Segments 3, 4A, and 4B in favor of Segments 7 and 8, because the City does not have sufficient supply to implement all segments. The estimated cost is $1,804/ac-ft.

8.4 SYSTEM SUMMARY

The nine segments described in the previous section are summarized in Table 8.19, while the assumed system controls of the proposed facilities are listed in Table 8.20.

Table 8.19 Segment Summary
Recycled Water Master Plan
City of Pomona

Facility	Description	Required Facilities	Potential MMD	Segment Cost/ac-ft
Segment 1	This segment includes connecting customers adjacent to the existing system and making modifications to existing customer systems, so that they may use more recycled water.	2 Pump Stations 2 Reservoirs	1.61 mgd [1] - 0.19 mgd [2]	$763 [1] - $368 [2]
Segment 2	This segment extends the existing system south to anchor customer Lanterman Hospital.	None	0.19 mgd	$2,655 [3][4]
Segment 3	This segment extends the existing system to Ganesha Park and the Fairplex, which act as anchor customers.	2 Pump Stations 4 Additional Pumps (Zone 2 PS) 1 Reservoir	0.54 mgd	$3,060
Segment 4A	Segment 4A is an expansion of the existing system to the area immediately north of the existing system.	1 Pump Station	0.23 mgd	$2,144
Segment 4B	Segment 4B extends the existing system from Segment 3 in order to supply customers between Ganesha Park and Pomona Senior High.	2 Additional Pumps 1 Reservoir	0.44 mgd	$2,409
Segment 5	Using the IEUA as a supply source, this segment extends recycled water service to the east side of the City. Braun Linens acts as an anchor customer for the segment.	*None*	0.66 mgd	$2,773
Segment 6	This segment maximizes use of the IEUA supply by extending the initial east side extension to a Garey Senior High School.	1 Pump Station 1 Reservoir	0.42 mgd	$2,449

Table 8.19 Segment Summary
Recycled Water Master Plan
City of Pomona

Facility	Description	Required Facilities	Potential MMD	Segment Cost/ac-ft
Segment 7	Segment 7 extends the existing system from the existing reservoirs in order to supply customers between the existing system and Phillips Ranch.	1 Pump Station	0.40 mgd	$3,444
Segment 8	If additional IEUA supply is available, this segment extends service from Segment 6 to additional customers adjacent to Route 60.	1 Additional Pump	0.14 mgd	$3,253
Segment 9	This segment extends service from Segment 7 to the additional customers in the Phillips Ranch area.	1 Additional Pump 1 Pump Station	0.80 mgd	$1,804

Notes:

(1) Based on combined Segment 1 demand and cost estimates listed in Table 8.3 and Table 8.4 (includes Cal Poly Pomona and Forest Lawn)

(2) Based on Segment 1 demand and cost estimates listed in Table 8.4 only (excludes Cal Poly Pomona and Forest Lawn)

(3) Due current state budget constraints, it is unlikely that the hospital will have the funding to connect to a potential recycled water main. Consequently, the hospital is not included in the calculation for this number. If included, the unit cost would be significantly lower.

(4) Cost would increase to $4,903/ac-ft if a new 12-inch main is installed in lieu of rehabilitating the existing 12-inch main.

Table 8.20 Recommended SCADA Monitoring and Control
Recycled Water Master Plan
City of Pomona

Facility	Control (Switch On)	Control (Switch Off)	Monitor
Zone 2 PS	Pressure Control	Pressure Control	Flow Rate
Zone 3 PS	Time Based Control	Level Control (Full)	Flow Rate
North Reservoirs	N/A	N/A	Reservoir Level
North Booster PS	Pressure Control	Pressure Control	Flow Rate
East Reservoir	N/A	N/A	Reservoir Level
East Booster PS	Pressure Control	Pressure Control	Flow Rate
PRV Stations			Pressure Upstream/Downstream

8.5 FUTURE SYSTEM EVALUATION

As described in the discussions for some of the segments, the City's existing recycled water supply limits the recycled water system expansions that can be served. The second supply source from IEUA or additional supply from the PWRP as discussed in Chapter 4 is therefore required to serve all potential customers and create a looped system as shown in Figure 8.1.

During the course of the project, additional discussions with IEUA took place to verify the available supply and potential delivery schemes. During these discussions it was decided that IEUA will not be able to supply recycled water within the planning horizon of this report (see Appendix E for relevant project correspondence). As Segments 5 and 6 were created and designed to be served by the IEUA regional recycled water system, these segments were eliminated for consideration of the recommended system.

The remaining segments were evaluated and ranked to develop a recommended system for year 2030. The segments that were not included in the recommended system were included as part of the ultimate system.

8.5.1 Alternative Development

Considering the recycled water supply constraints and cost considerations, two alternatives were developed for the expansion of the City's recycled water system. The alternatives are as follows:

- **Alternative 1**. This alternative expands the recycled water system to the south and east and includes Segments 1, 2, 7, 9 and 8.
- **Alternative 2.** This alternative expands the recycled water system to the north and east and includes Segments 1, 2, 3, 4A, and 4B.

Figure 8.11 presents a flowchart of each alternative that displays unit cost per segment and supply utilization, while the cost and supply needs for each alternative are summarized in Table 8.21.

It should be noted that for this evaluation, the capital cost for Segment 1 has been reduced significantly compared to the capital cost presented previously in this chapter. The cost for Segment 1 presented in Table 8.21 only includes those capital costs that are associated with the City's recycled water system. Since Segment 1 includes infrastructure improvements for facilities that would be owned and operated by Forest Lawn Mortuary and Cal Poly Pomona, these costs are now excluded in the unit cost estimate of Segment 1.

Table 8.21 Alternative Summary
Recycled Water Master Plan
City of Pomona

Alternative 1 [1]	Capital Cost ($millions)	Additional Supply Needed	New Demand AAD [2] (ac-ft/yr)	$/AF
Segment 1	$0.3	No	868	$368 [3(5)]
Segment 7	$9.9	No	210	3,444
Segment 9	$10.4	No [3]	419	$1,804
Segment 8	$3.2	Yes	71	$3,253
Segment 2	$1.3	Yes	107	$2,655 [4]
Total	**$25.2**		**1,675**	**$2,289**
Alternative 2 [1]				
Segment 1	$0.3	No	868	$368 [5]
Segment 4A	$4.0	No	135	$2,144
Segment 3	$11.9	No [3]	282	$3,060
Segment 4B	$7.7	Yes	231	$2,409
Segment 2	$1.3	Yes	107	$2,665 [4]
Total	**$25.2**		**1,623**	**$2,447**

Notes:

(1) Segments for each alternative as presented in this chapter. See Figure 8.11.

(2) AAD = Average Annual Demand.

(3) Sufficient supply available if Cal Poly does not develop the Spadra Landfill area.

(4) Calculated number does not include demands from Lanterman Hospital and/or Robertson's Ready Mix.

(5) The $/ac-ft represents the unit cost for the City and excludes cost for improvement projects that would be owned and operated by Cal Poly and Forest Lawn.

These two alternatives were further evaluated and discussed with City staff to define the recommended system for this CIP. Based on these discussions, Alternative 1 was selected as the basis of the recommended system. Alternative 1 is more cost effective on a per acre-ft basis and focuses on segments considered most viable by the City. Subsequently, the recommended system includes the most cost effective ($/ac-ft) segments from Alternative 1 that can be supplied with the existing supply capacity from the PWRP.

8.5.2 Recommended System Selection

The recommended system consists of Segments 1, 7, and 9 from Alternative 1. These segments were chosen based on the projected supply capacity discussed in Chapter 4 and the overall cost-effectiveness of the combination of segments. The demands, supplies, and unit cost per segment are presented on Figure 8.12, while a map of the recommended system is shown on Figure 8.13. The projects required for the recommended system are all included in the CIP of this master plan, which has a planning horizon of year 2030.

ALTERNATIVE 1 (Cost Weighted Average $2,289/ac-ft. Does not include Segment 3, 4A, & 4B)

Existing System

Supply:
- PWRP: 6mgd
- Non Potable Wells: 1mgd
- Total: 7mgd

Demand:
- 4.6[1] mgd MMD

2.4 mgd Surplus

Segment 1

Supply:
2.4 mgd
Additional Demand
1.61 mgd
Cost
$368/ac-ft

0.79 mgd Surplus

Segment 7

Supply:
0.79 mgd
Additional Demand
0.40 mgd
Cost
$3,444/ac-ft

0.39 mgd Surplus

INSTALL VFDS AT PWRP PS

Segment 9

Supply:
0.39 mgd (0.99 mgd)[2]
Additional Demand
0.80 mgd
Cost
$1,804/ac-ft

0 mgd Surplus

ADDITIONAL SUPPLY FROM PWRP OR IEUA

Segment 8

Supply:
TBD
Additional Demand
0.14 mgd
Cost
$3,253/ac-ft

Segment 2

Supply:
TBD
Additional Demand
0.19 mgd
Cost
$2,655/ac-ft

ALTERNATIVE 2 (Cost Weighted Average $2,447/ac-ft. Does not include Segment 7, 8 & 9)

Existing System

Supply:
- PWRP: 6mgd
- Non Potable Wells: 1mgd
- Total: 7mgd

Demand:
- 4.6[1] mgd MMD

2.4 mgd Surplus

Segment 1

Supply:
2.4 mgd
Additional Demand
1.61 mgd
Cost
$368/ac-ft

0.79 mgd Surplus

Segment 4A[3]

Supply:
0.79 mgd
Additional Demand
0.23 mgd
Cost
$2,144/ac-ft

0.56 mgd Surplus

INSTALL VFDS AT PWRP PS

Segment 3

Supply:
0.56 mgd (1.16 mgd)[2]
Additional Demand
0.52 mgd
Cost
$3,060/ac-ft[4]

0 mgd Surplus

ADDITIONAL SUPPLY FROM PWRP OR IEUA

Segment 4B

Supply:
TBD
Additional Demand
0.44 mgd
Cost
$2,409/ac-ft

Segment 2

Supply:
TBD
Additional Demand
0.19 mgd
Cost
$2,655/ac-ft

Notes:
(1) Includes future demand increases for existing customers.
(2) Supply could be greater by about 0.60 mgd if Cal Poly foregoes irrigation/golf course construction on Spadra Landfill.
(3) Requires construction of a small portion of Segment 3 between the existing system and customer 45 as shown on Figure 8.2.
(4) Includes the cost of the small portion of Segment 3 required for Segment 4A. This portion of Segment 3 is between the existing system and customer 45 as shown on Figure 8.2.

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ALTERNATIVES
RECYCLED WATER
MASTER PLAN
FIGURE 8.11

2030

Recommended System without Additional Supplies (Cost Weighted Average is $2,171/ac-ft.)

Existing System

Supply:
- PWRP: 6 mgd
- Non Potable Wells: 1 mgd
- Total: 7 mgd

Demand, MMD: 4.6[1] mgd

2.4 mgd Surplus

Segment 1

Supply: 2.4 mgd
Demand, MMD: 1.61 mgd
Cost: $368/ac-ft

0.79 mgd Surplus

Segment 7

Supply: 0.79 mgd
Demand, MMD: 0.40 mgd
Cost: $3,444/ac-ft

0.39 mgd Surplus

INSTALL VFDS AT PWRP PS

Segment 9

Supply: 0.39 mgd (0.99 mgd)[2]
Demand, MMD: 0.80 mgd
Cost: $1,804/ac-ft

Recommended System with Additional Supplies from PWRP or IEUA (Cost Weighted Average is $2,510/ac-ft.)

Existing System

Supply:
- PWRP: 6 mgd
- Non Potable Wells: 1 mgd
- Total: 7 mgd

Demand, MMD: 4.6[1] mgd

2.4 mgd Surplus

Segment 1, 7 and 9

Supply: 2.4 mgd (3.0 mgd)[2]
Demand, MMD: 2.81 mgd
Cost: $2,171/ac-ft

0 mgd Surplus

ADDITIONAL SUPPLIES

Segment 5 and 6

Supply: TBD
Demand, MMD: 1.08 mgd
Cost: $2,657/ac-ft

Segment 4A

Supply: TBD
Demand, MMD: 0.23 mgd
Cost: $2,144/ac-ft

Segment 3

Supply: TBD
Demand, MMD: 0.54 mgd
Cost: $3,060/ac-ft

Segment 4B

Supply: TBD
Demand, MMD: 0.44 mgd
Cost: $2,409/ac-ft

Segment 8

Supply: TBD
Demand, MMD: 0.14 mgd
Cost: $3,253/ac-ft

Segment 2

Supply: TBD
Demand, MMD: 0.19 mgd
Cost: $2,655/ac-ft

Notes:
(1) Includes future demand increases for existing customers
(2) Supply could be greater by about 0.60 mgd if Cal Poly foregoes irrigation/golf course construction on Spadra Landfill

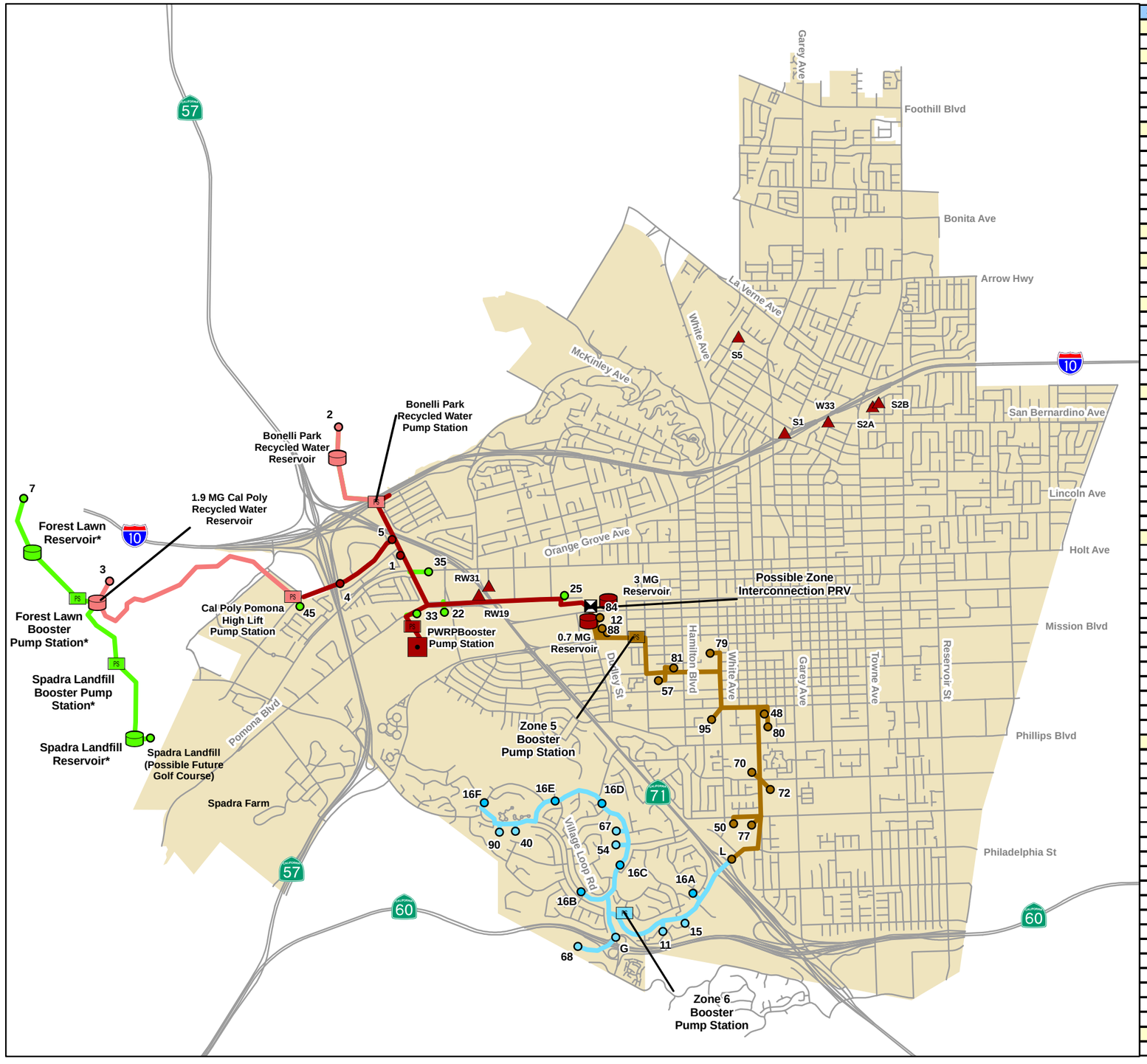
START 2009

2030

2050

RECOMMENDED AND ULTIMATE SYSTEMS FLOW CHART

FIGURE 8.12



Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
B	I-10 & Fairplex	H	SR-60 & Reservoir Rd.
C	I-10 & Garey	I	SR-60 & Towne
D	I-10 & Towne	J	SR-71 & Garey
E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
Potential Customers - Cemeteries			
7	Forest Lawn Mortuary	9	Pomona Cemetery
8	Holy Cross Cemetery		
Potential Customers - Homeowners Associations			
10	Amcal Portofino Villas	15	Phillips Meadows
11	Country Pk Villas	16	Phillips Ranch (A - F)
12	Estates-Pomona Westland	17	Quail Creek Pomona
13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
20	Braun Linen Service	29	Pomona Fairplex
21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
37	Centennial Park	50	Mlk Jr Memorial Park
38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
40	Country Crossing Park	53	Philadelphia Park
41	Ganesha Park	54	Phillips Ranch Park
42	Garfield Park	55	Pomona Jaycee Park
43	Hamilton Park	56	Powers Park
44	John F. Kennedy Park	57	Ralph Welch Park
45	Kellogg Park	58	Ted Greene Park
46	Kiwanis Park	59	Veterans Park
47	Lincoln Park	60	Washington Park
48	Madison Park	61	Westmont Park
49	Memorial Park	62	Willie White Park
Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
66	Cortez Elementary	85	Philadelphia Elementary
67	Decker Elementary	86	Pomona Alternative (PAS)
68	Diamond Ranch Senior High	87	Pomona Senior High
69	Emerson Middle	88	Pomona Vocational
70	Fremont Middle	89	Pueblo Elementary
71	Ganesha Senior High	90	Ranch Hills Elementary
72	Garey Senior High	91	Roosevelt Elementary
73	Garey Village (HS)	92	San Antonio Elementary
74	Harrison Elementary	93	San Jose Elementary
75	John Marshall Middle	94	Simons Middle
76	Kingsley Elementary	95	Vejar Elementary
77	Lexington Elementary	96	Village Academy (HS)
78	Lincoln Elementary	97	Washington Elementary
79	Lopez Elementary	98	Westmont Elementary
80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Well
- Booster Pump Station
- Reservoir
- PRV
- Existing or Potential Recycled Water Customer
- Pipeline
- Existing System: Pomona
- Existing System: Bonelli Park & Cal Poly (Not Maintained by City of Pomona)
- Segment 1*
- Segment 7
- Segment 9
- Streets
- City Limits/Service Area

Feet
0 3,000 6,000

Figure 8.13
Recommended System
Recycled Water Master Plan
City of Pomona

Note: *Potential Bonelli Park & Cal Poly System Expansions are not maintained or financed by the City of Pomona.

As shown on Figure 8.12, the recommended system includes expansions from Cal Poly Pomona to the Forest Lawn and the Spadra Landfill sites, which are the two customers with the largest demands. It is assumed that these customers will pay for the expansions downstream of the Cal Poly Pomona Reservoir and the associated costs of these pipelines, pump stations, and reservoir storage are therefore excluded from the CIP and unit cost estimates presented herein. The next expansion that is part of Segment 1 would serve a few industrial customers along Pomona Boulevard southeast of the PWRP. The remaining system expansions that are part of the recommended system would extend the City's recycled water system in southeast direction along SR-71 towards Philadelphia Boulevard (Segment 7) and then cross SR-71 to the west to serve portions of the Phillips Ranch area with recycled water (Segment 9).

8.5.3 Ultimate System Description

The ultimate system includes all remaining segments that are not part of the recommended system. These omitted portions included in the ultimate system are Segments 2, 3, 4a, 4b, 5, 6, and 8. The demands, supplies, and unit cost per segment of the ultimate system are presented on Figure 8.12. For planning purposes, it is assumed that the ultimate system would be developed by year 2050.

As shown on Figure 8.12, the ultimate system would required additional recycled water supplies from either the Sanitation Districts of Los Angeles County deliveries at the PWRP and/or the IEUA through a connection with the San Antonio Pipeline on the eastern part of the City. The SDLAC would need to install equalization basins to increase the plant capacity, which is not scheduled at this time. Per the current statements from IEUA, there is no commitment to deliver recycled water to the City of Pomona (see Appendix E). Due to the uncertainty of the additional recycled water supplies and the substantial capital costs of the system expansions already included in the recommended system, it was decided to move all system expansions that would require additional supplies beyond the planning horizon of 2030.

If additional supplies are secured in the future, the City's recycled water system could be expanded further to include all segments shown in Figure 8.2. The ultimate system consists of a looped system network that would most likely be fed from two sources, the PWRP on the west and the IEUA on the east. This looped system would greatly enhance the overall system reliability and maximize the amount of recycled water served. The ultimate system would consist of six different pressure zones, requiring various new booster stations and storage reservoirs to serve clients with reasonable system pressures throughout the City's service area.

Although the system expansions of the ultimate system are not cost-effective at this time, the anticipated increase in potable water cost over the next two decades will likely change the threshold when recycled water is cost-effective.

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CAPITAL IMPROVEMNT PROGRAM

9.1 INTRODUCTION

The purpose of this chapter is to provide the City of Pomona (City) with a phased capital improvement program (CIP) that will guide the City with regard to recycled water system prioritized expansions in an effort to offset potable water demand requirements as much as possible.

The previous chapter was concluded with a recommended recycled water system. In this chapter cost assumptions used are presented, followed by a description of the proposed and ultimate systems, and proposed project phasing. Subsequently, funding options to finance the recommended CIP are discussed, followed by a discussion of a financial feasibility analysis and recommendations.

9.2 COST ASSUMPTIONS

The cost for each expansion segment is a combination of construction costs and project costs. Construction costs account for the budget required for a contractor to install the proposed infrastructure. Project costs account for project contingencies, construction management, engineering, planning, and legal fees. The cost assumptions used in this report are discussed in the following sections.

9.2.1 Level of Accuracy

The level of accuracy for cost estimates varies depending on the level of detail to which the project has been defined. Feasibility studies and master plans represent the lowest level of accuracy, while pre-bid estimates represent a much higher level of accuracy. The American Association of Cost Engineers has developed the following guidelines for developing project cost estimates:

Type of Estimate	Anticipated Accuracy
Order-of-Magnitude (Master Plans)	+50% to -30%
Budget Estimate (Pre-design Report)	+30% to -15%
Budget Estimate (Design Report)	+15% to -5%

The opinions of cost presented in this report should be considered order-of-magnitude estimates, with an anticipated level of accuracy of +50 to -30 percent. The cost opinions presented herein represent April 2009 dollars consistent with the Los Angeles metropolitan area Engineering News Record (ENR) value of 9,764. Future adjustments of cost estimates can be estimated by increasing the estimated capital cost by the ratio of the future ENR to 9,794.

9.2.2 Construction Costs

The construction costs can include a combination of the following cost items:

- Customer Connections
- Customer Retrofits
- Distribution System Cost
- Pump Stations
- Storage Tanks
- Pressure Reducing Valves
- Land Acquisition
- Jack and Bore Crossings

Each element is discussed below and unit costs for each element are summarized in Table 9.1. Unit costs for each element are based on previous project experience.

Table 9.1 Construction Cost Assumptions
Recycled Water Master Plan
City of Pomona

Category	Unit Cost
Pipelines	**$/linear ft**
2 to 4-inch diameter	$130
6-inch diameter	$150
8-inch diameter	$180
12-inch diameter	$230
16-inch diameter	$290
20-inch diameter	$340
24-inch diameter	$410
Pump Stations	**$/hp**
<100 hp	$6,500
100 - 500 hp	$5,000
600 - 1,000 hp	$3,500
Storage Tanks (Steel)	**$/gallon**
≤1 MG	$1.25
1.1 - 3.0 MG	$1.00
3.1 - 5.0 MG	$0.75
5.1 – 10 MG	$0.50

Table 9.1 Construction Cost Assumptions Recycled Water Master Plan City of Pomona	
Category	**Unit Cost**
PRV Costs	**$/PRV**
Station w/ Vault	$50,000
Land Acquisition	**$/acre**
Per 1-acre site	$325,000
Customer Connections	**$/Customer**
Per connection	$6,000
Customer Retrofits	**$/Customer**
Per connection	$10,000 - $100,000
Jack and Bore Crossings	**$/linear ft**
Railroad/Highway Crossings	$250

9.2.2.1 Customer Connections

Connections are required for serving recycled water from the distribution pipelines to customer properties. Items included in the connection cost are: tapping the distribution mains and installing service laterals, meters, pressure reducing valves (PRVs), and backflow prevention devices on the potable water system. It is assumed that the average diameter size for laterals, meters, and PRVs will be 2 inches. Customer connection costs are estimated to be $3,000 each plus $3,000 each for the installation of a backflow prevention device, totaling $6,000 per customer connection.

9.2.2.2 Customer Retrofits

Retrofit costs are associated with separating the customer's existing potable water system from a new recycled water system. An example would be a park where restroom and drinking fountain water supply pipes would need to be isolated from an existing irrigation system. Additional costs include posting signage, which identifies where recycled water is being used. Customer retrofits are one-time costs and are dependent upon the complexity of existing irrigation systems at each individual site. If the site has existing separate potable water systems, then the retrofit cost is assumed to be zero. Retrofits can vary from approximately $10,000 to $100,000 depending on the extent of system replacements. The customers with no potable water demand and 100 percent recycled water demand have no retrofit costs because there is no need to separate an existing potable water system from a new recycled water system.

Customer retrofit costs were not included in any of the expansion segment estimates since it was assumed that the City would charge any new customer 100 percent of the potable water billing rate until such costs are recovered. Nevertheless, such costs are listed here for the City's reference.

9.2.2.3 Distribution System Cost

Construction costs for the distribution system include pipe material, excavation, installation, bedding material, backfill material, transport, and paving where applicable. Valves and appurtenances are also included in the unit pipeline cost. The costs of acquiring easements for pipeline construction are not included in this estimate, although most distribution pipeline routings are within existing City street right-of-ways. The range for pipeline capital costs is from 4-inch diameter pipelines at $130 per linear foot (LF), to 24-inch diameter pipelines at $410/LF. Table 9.1 lists the unit cost used for all pipeline diameter sizes. All recycled water pipelines would be purple pipe in order to distinguish the pipe from adjacent potable water pipelines.

9.2.2.4 Pump Stations

Pump station costs are based on capacity, in horsepower (hp), of the station, including the spare pump unit. As shown in Table 9.1, the unit pump station cost ranges from $3,500/hp to $6,500/hp.

9.2.2.5 Storage Tanks

Storage tanks are required to attenuate wastewater effluent flows at water reclamation plants (also referred to as equalization storage) and provide a buffer for daily recycled water demand variations (also referred to as operational storage). Cost varies by tank size and is assumed to decrease with increasing volume as listed in Table 9.1.

9.2.2.6 Land Acquisition

Land acquisition does not require contingency or mark-up costs and is estimated at $325,000/acre. This is the unit cost was provided by City staff and would typically represent the cost for a vacant parcel of land without any improvements. However, land costs vary greatly by location, size, and shape of a parcel.

9.2.2.7 Jack and Bore Crossings

An additional cost of $250 per linear foot was added for the length of any proposed pipeline crossing a highway or railroad.

9.2.3 Project Costs

Once the construction costs were estimated for each segment, the following project costs were added to the estimate the total project cost, which is also referred to as the capital cost:

- Contingency Cost
- Construction Management Cost
- Engineering, Administration, Planning, and Legal Cost

The assumptions used in this RWMP to estimate capital cost are listed in Table 9.2.

**Table 9.2 Capital Project Cost Assumptions
Recycled Water Master Plan
City of Pomona**

Description	Value
Contingency	30% of the construction cost (CC) (1)
Construction Management	10% of the CC plus contingency (2)
Engineering, Administration, Legal	25% of the CC plus contingency (2)
Capital Cost	**176% of the CC**

Notes:

(1) CC is the cost of materials and installation only.

(2) Includes direct construction cost and contingency cost.

(3) Capital Cost includes the construction cost, contingency, engineering, administration, legal, and construction management cost.

9.2.4 Operations and Maintenance Costs

For each segment, operations and maintenance (O&M) costs were also developed. The following items were considered:

- Purchased Power for Pumping
- Distribution System Maintenance
- General Administration
- Full Time Employee Costs

These O&M costs are used in the financial feasibility analysis discussed in Section 9.7. A detailed breakdown of the O&M costs is included in Appendix J for both segments and proposed project phases. A brief description of each O&M cost is given in the following sections.

9.2.4.1 Purchased Power

The average recycled water demands were used to determine power consumption. Costs for electricity are based on a unit price of $0.16 per kilowatt-hour (kWh).

9.2.4.2 Distribution System Maintenance

The average annual maintenance expense for the recycled water distribution system was based on an assumed value of $9,500 per mile per year. This value is equivalent to the amount of money the City would need to save each year for a complete replacement of the distribution system in 50 years assuming 6-percent interest and 2-percent inflation. This value was verified with system maintenance costs from other municipalities.

9.2.4.3 General Administration

General administration includes costs associated with customer accounting, meter reading, and other miscellaneous costs associated with operating a water system. General administration costs are estimated at $2,500 per mile of distribution pipeline per year.

9.2.4.4 Full Time Employee

The average cost of a full time employee (FTE) is assumed to be $60,000/year. This includes both salary and overhead costs such as medical insurance. O&M costs estimate 0.25 FTE per mile of pipe.

9.3 RECOMMENDED AND ULTIMATE SYSTEMS

The majority of the potential recycled water customers identified in Chapter 3 were initially connected by a looped system that could be supplied from both the Pomona Water Reclamation Plant (PWRP) and a connection with the Inland Empire Utilities Agency (IEUA) on the east side of the City. This looped system was divided into ten different segments as shown on Figure 9.1.

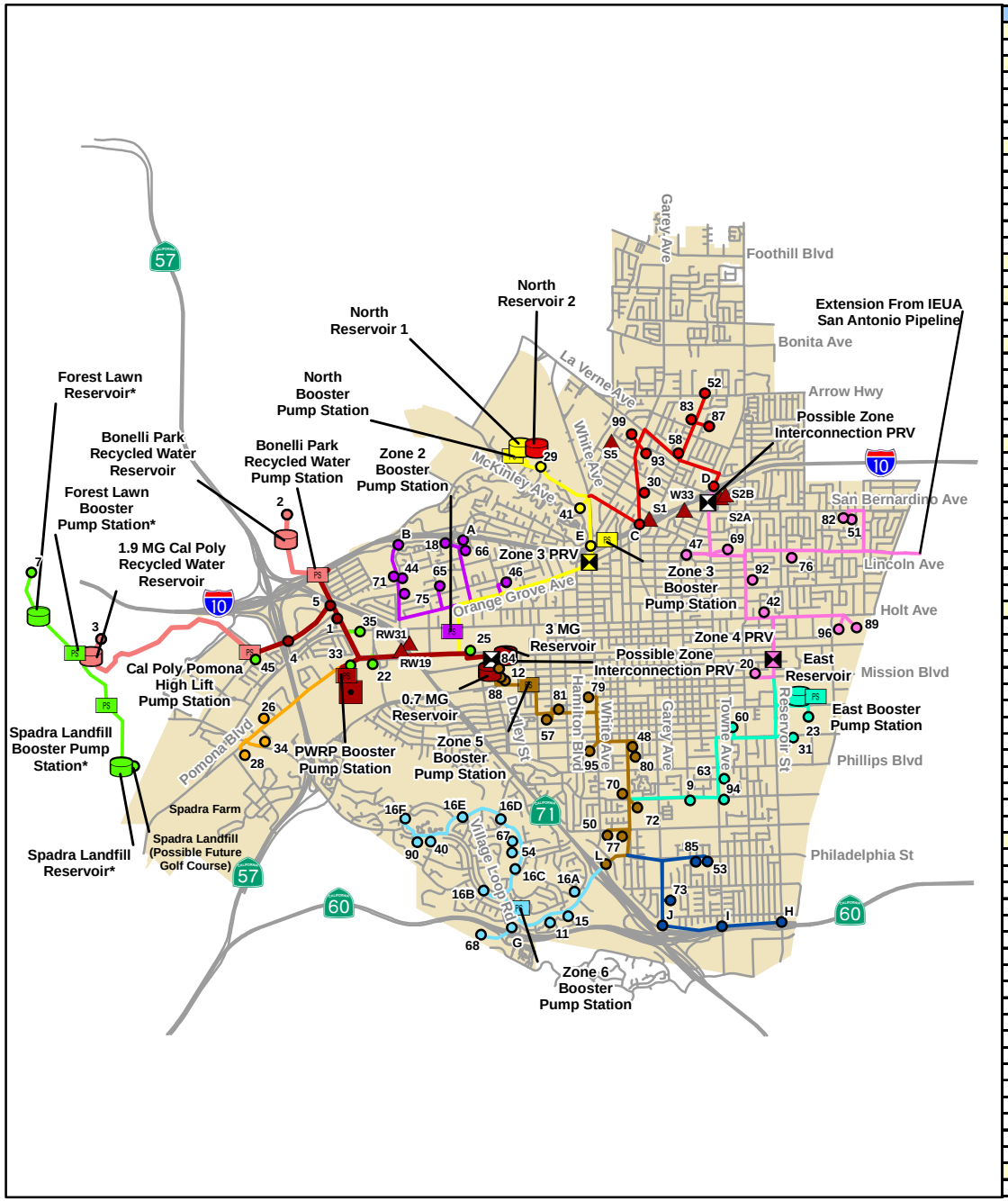
As discussed in Chapter 8, the potential second supply from IEUA is no longer considered based on discussions with their staff (see Appendix E). This reduced the total available projected supply for year 2030 and thereby eliminated the possibility to serve all potential customers.

With the future recycled water supply being the limiting factor, it was determined that it was most cost-effective to eliminate Segments 5 and 6 and thereby the concept of a looped recycled water system. Chapter 8 includes a more detailed analysis of the cost of each segment, customers served, and the alternatives evaluated. Chapter 8 concludes with the two proposed systems. These are:

- Recommended System. Proposed recycled water system for year 2030
- Ultimate System. Proposed system expansions beyond 2030 to 2050

9.3.1 Recommended System

The recommended system includes those segments that can be supplied with the current supply capacity from the PWRP and are considered most viable based on unit cost expressed in dollar per acre-foot ($/ac-ft) of recycled water served and discussions with City staff. This recommended system consists of Segments 1, 7, and 9. A phased map of the recommended system is shown on Figure 9.2. The projects required for the recommended system are all included in the CIP of this master plan, which has a planning horizon of year 2030.



Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
B	I-10 & Fairplex	H	SR-60 & Reservoir Rd.
C	I-10 & Garey	I	SR-60 & Towne
D	I-10 & Towne	J	SR-71 & Garey
E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
Potential Customers - Cemeteries			
7	Forest Lawn Mortuary	9	Pomona Cemetery
8	Holy Cross Cemetery		
Potential Customers - Homeowners Associations			
10	Amcal Portofino Villas	15	Phillips Meadows
11	Country Pk Villas	16	Phillips Ranch (A - F)
12	Estates-Pomona Westland	17	Quail Creek Pomona
13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
20	Braun Linen Service	29	Pomona Fairplex
21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
37	Centennial Park	50	Mlk Jr Memorial Park
38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
40	Country Crossing Park	53	Philadelphia Park
41	Ganesha Park	54	Phillips Ranch Park
42	Garfield Park	55	Pomona Jaycee Park
43	Hamilton Park	56	Powers Park
44	John F. Kennedy Park	57	Ralph Welch Park
45	Kellogg Park	58	Ted Greene Park
46	Kiwanis Park	59	Veterans Park
47	Lincoln Park	60	Washington Park
48	Madison Park	61	Westmont Park
49	Memorial Park	62	Willie White Park
Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
66	Cortez Elementary	85	Philadelphia Elementary
67	Decker Elementary	86	Pomona Alternative (PAS)
68	Diamond Ranch Senior High	87	Pomona Senior High
69	Emerson Middle	88	Pomona Vocational
70	Fremont Middle	89	Pueblo Elementary
71	Ganesha Senior High	90	Ranch Hills Elementary
72	Garey Senior High	91	Roosevelt Elementary
73	Garey Village (HS)	92	San Antonio Elementary
74	Harrison Elementary	93	San Jose Elementary
75	John Marshall Middle	94	Simons Middle
76	Kingsley Elementary	95	Vejar Elementary
77	Lexington Elementary	96	Village Academy (HS)
78	Lincoln Elementary	97	Washington Elementary
79	Lopez Elementary	98	Westmont Elementary
80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

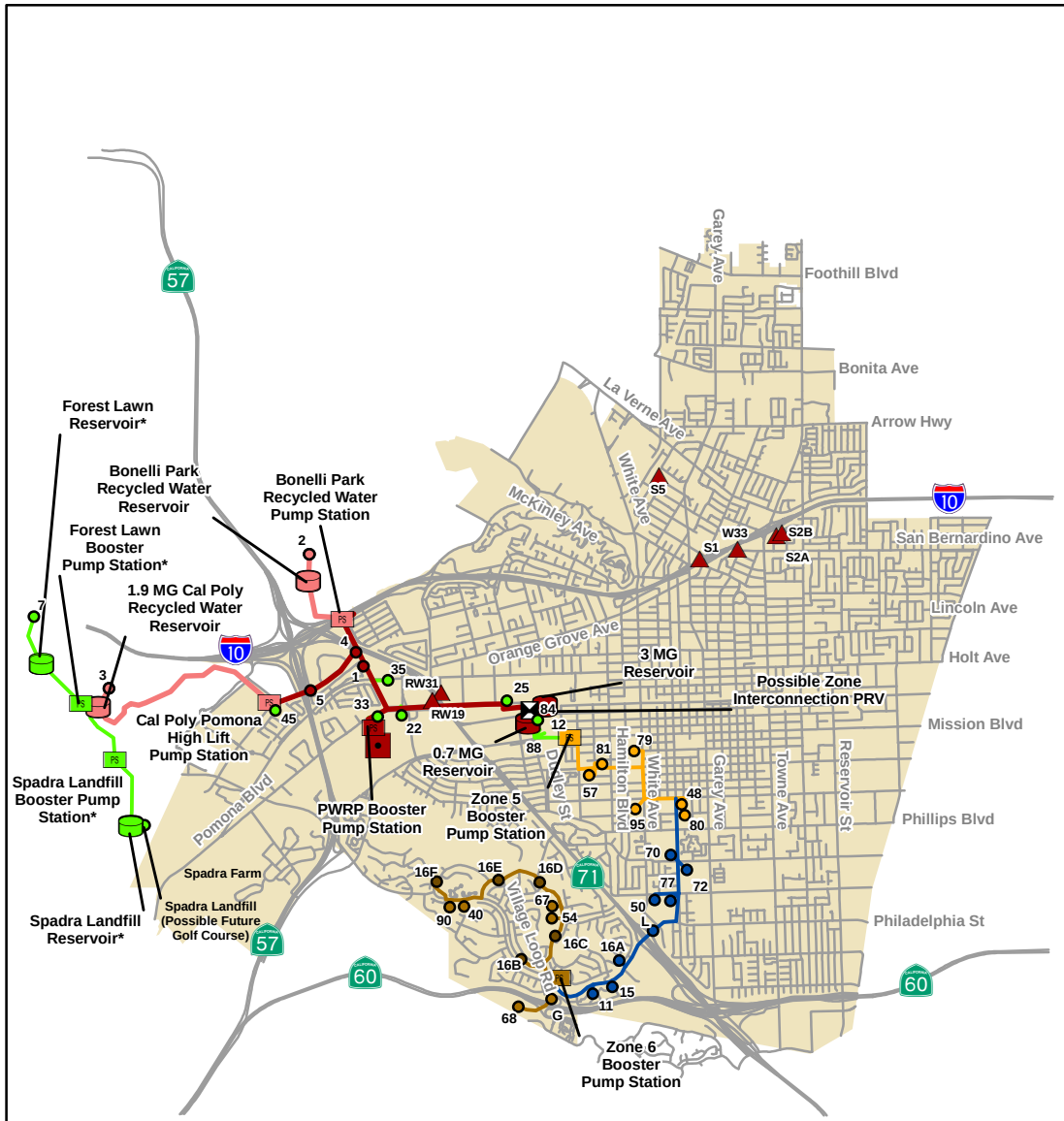
Legend

- Water Reclamation Plant
- Non-Potable Well
- Booster Pump Station
- Reservoir
- PRV
- Existing or Potential Recycled Water Customer
- Pipeline
- Existing System: Pomona
- Existing System : Bonelli Park & Cal Poly (Not Maintained by City of Pomona)
- Segment 1*
- Segment 2
- Segment 3
- Segment 4A
- Segment 4B
- Segment 5
- Segment 6
- Segment 7
- Segment 8
- Segment 9
- Streets
- City Limits/Service Area

Feet
0 4,500 9,000

Figure 9.1
System Expansion Segments
Recycled Water Master Plan
City of Pomona

Note: *Potential Bonelli Park & Cal Poly System Expansions are not maintained or financed by the City of Pomona.



Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
B	I-10 & Fairplex	H	SR-60 & Reservoir Rd.
C	I-10 & Garey	I	SR-60 & Towne
D	I-10 & Towne	J	SR-71 & Garey
E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
Potential Customers - Cemeteries			
7	Forest Lawn Mortuary	9	Pomona Cemetery
8	Holy Cross Cemetery		
Potential Customers - Homeowners Associations			
10	Amcal Portofino Villas	15	Phillips Meadows
11	Country Pk Villas	16	Phillips Ranch (A - F)
12	Estates-Pomona Westland	17	Quail Creek Pomona
13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
20	Braun Linen Service	29	Pomona Fairplex
21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
37	Centennial Park	50	Mlk Jr Memorial Park
38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
40	Country Crossing Park	53	Philadelphia Park
41	Ganesha Park	54	Phillips Ranch Park
42	Garfield Park	55	Pomona Jaycee Park
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46	Kiwanis Park	59	Veterans Park
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48	Madison Park	61	Westmont Park
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Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
66	Cortez Elementary	85	Philadelphia Elementary
67	Decker Elementary	86	Pomona Alternative (PAS)
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80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Well
- Booster Pump Station
- Reservoir
- PRV
- Existing or Potential Recycled Water Customer
- Pipeline
- Existing System: Pomona
- Existing System : Bonelli Park & Cal Poly (Not Maintained by City of Pomona)
- Phase I* (Segments 1, 7P*)
- Phase II (Segment 7P*)
- Phase III (Segments 7P*, 9P*)
- Phase IV (Segment 9P*)
- P* Partially Developed In This Phase
- Streets
- City Limits/Service Area

N

0 4,500 9,000 Feet

Figure 9.2
Phasing of Recommended System
Recycled Water Master Plan
City of Pomona

carollo Engineers...Working Wonders With Water™

Note: *Potential Bonelli Park & Cal Poly System Expansions are not maintained or financed by the City of Pomona.

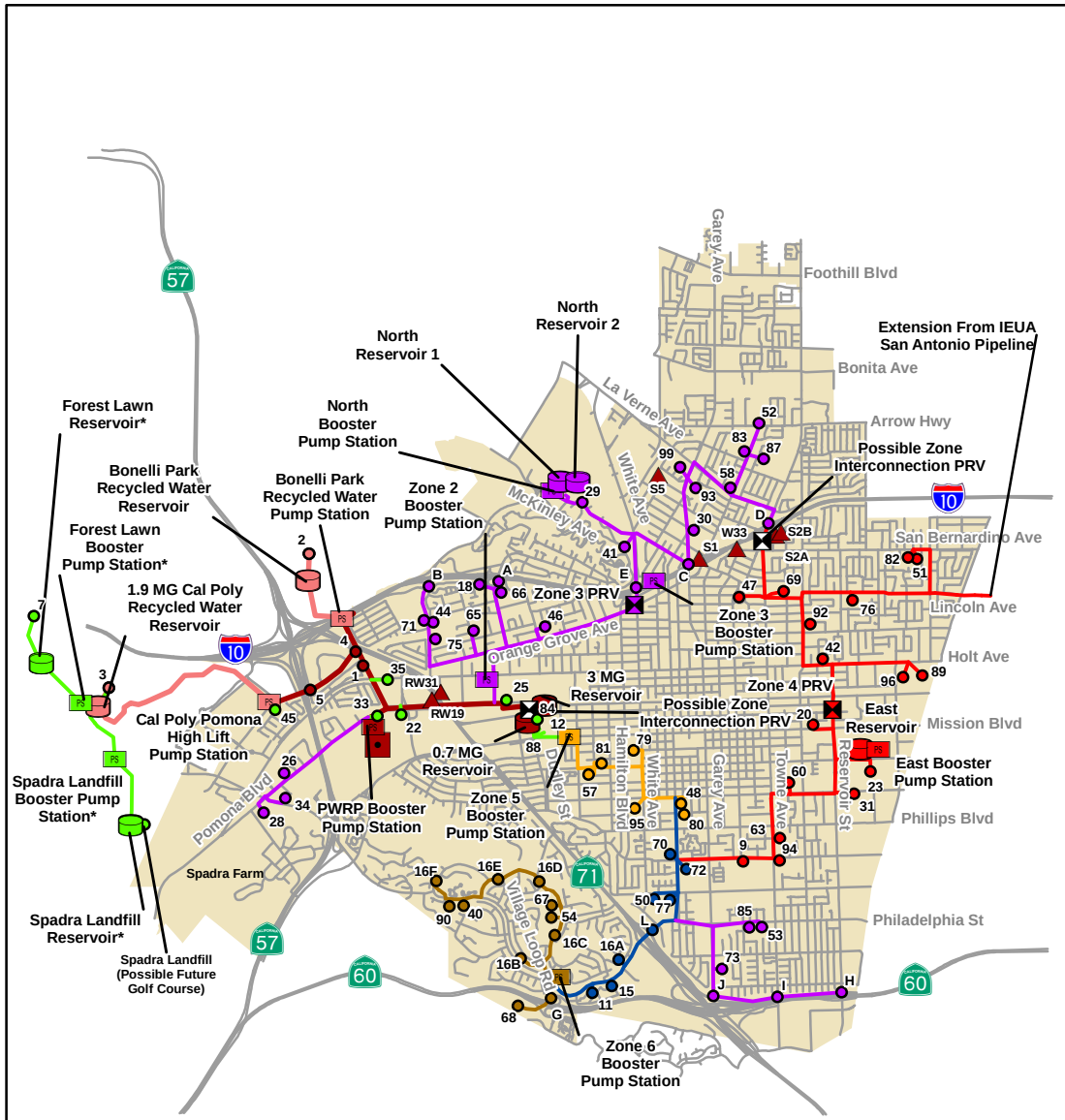
As shown on Figure 9.2, the recommended system includes expansions of existing onsite segments from Cal Poly Pomona to serve the Forest Lawn and the Spadra Landfill sites, which are customers with the largest demands. This segment expansion will not be funded or maintained by the City of Pomona. It is assumed that these customers will pay for the expansions downstream of the Cal Poly Pomona reservoir and the associated costs of these pipelines, pump stations, and reservoir storage are therefore excluded from the CIP and unit cost estimates presented. The next expansion that is part of Segment 1 would serve a few industrial customers along Pomona Boulevard southeast of the PWRP. The remaining system expansions that are part of the recommended system would extend the City's recycled water system in southeast direction along State Route 71 (SR-71) towards Philadelphia Boulevard (Segment 7) and then cross SR-71 to the west to serve portions of the Phillips Ranch area with recycled water (Segment 9).

9.3.2 Ultimate System

The ultimate system includes all remaining segments that are identified on Figure 9.1 but that are not part of the recommended system. These omitted portions included in the ultimate system are Segments 2, 3, 4a, 4b, 5, 6, and 8. A phased map of the ultimate system is shown on Figure 9.3. For planning purposes, it is assumed that the ultimate system would be developed by year 2050. This longer planning horizon is due to the additional recycled water supplies from either the Sanitation Districts of Los Angeles County (SDLAC) deliveries at the PWRP and/or supply from IEUA through a connection with the San Antonio Pipeline on the eastern part of the City which would be necessary. Due to the uncertainty of the additional recycled water supplies and the substantial capital costs of the system expansions already included in the recommended system, it was decided to move all system expansions that would require additional supplies beyond the planning horizon of 2030.

If additional supplies are secured in the future, the City's recycled water system could be expanded further as depicted on Figure 9.3. The ultimate system consists of a looped system, which would greatly enhance the overall system reliability and maximize the amount of recycled water served. The ultimate system would consist of six different pressure zones, requiring various new booster stations and storage reservoirs.

Although the system expansions of the ultimate system are not cost-effective at this time, the anticipated increase in potable water cost over the next two decades will likely change the threshold when recycled water is cost-effective. Funding opportunities, which are discussed in detail later in this section, can also change this threshold significantly.



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81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Well
- Booster Pump Station
- Reservoir
- PRV
- Existing or Potential Recycled Water Customer
- Pipeline
- Existing System: Pomona
- Existing System : Bonelli Park & Cal Poly (Not Maintained by City of Pomona)
- Phase I (Segments 1, 7P*)
- Phase II (Segment 7P*)
- Phase III (Segments 7P*, 9P*)
- Phase IV (Segment 9P*)
- Phase V (Segments 5, 6)
- Phase VI (Segments 2, 3, 4A, 4B, 8)
- P* Partially Developed In This Phase
- Streets
- City Limits/Service Area

Feet
0 4,500 9,000

Figure 9.3
Phasing of Ultimate System
Recycled Water Master Plan
City of Pomona

Note: *Potential Bonelli Park & Cal Poly System Expansions are not maintained or financed by the City of Pomona.

9.3.3 Proposed System Cost Summary

The cost estimates for the recommended and ultimate systems are summarized in Table 9.3. A detailed breakdown of the capital costs for each expansion segment can be found in Chapter 8.

Table 9.3 Recommended System Cost
Recycled Water Master Plan
City of Pomona

Recommended System [1]	Capital Cost ($millions)	Additional Supply Needed	Annual Demand (ac-ft/yr)	Unit Cost ($/ac-ft)
Segment 1 [3]	$0.3	No	868	$368
Segment 7	$10.0	No	210	$3,444
Segment 9	$10.4	No [4]	419	$1,804
Subtotal	**$20.7**		**1,497**	**$2,171**
Ultimate System [2]				
Segment 2	$1.3	Yes	107	$2,655
Segment 3	$11.9	Yes	282	$3,060
Segment 4A	$4.0	Yes	135	$2,144
Segment 4B	$7.6	Yes	231	$2,409
Segment 5	$16.1	Yes	423	$2,773
Segment 6	$7.9	Yes	235	$2,449
Segment 8	$3.2	Yes	71	$3,253
Subtotal	**$52.0**		**1,484**	**$2,677**
GRAND TOTAL	**$72.7**		**2,981**	**$2,510**

Notes:

(1) Proposed System for year 2030 as shown on Figure 9.2.

(2) Proposed System for year 2050 as shown on Figure 9.3.

(3) The cost for Segment 1 presented in this table only includes those capital costs that are associated with the City's owned infrastructure. Segment 1 includes infrastructure improvements for facilities that would be owned and operated by Forest Lawn Mortuary and Cal Poly Pomona, which associated costs are excluded in the cost estimate. The unit cost is therefore lower than presented in Chapter 8.

(4) No additional supplies available as long as Cal Poly does not develop the Spadra Landfill.

9.4 PROJECT PHASING

Expansion segments are grouped into project phases based on the capital costs presented in Chapter 8 and summarized in Table 9.3. In general, the initial phases are most cost effective. Costlier segments are phased later to allow the City to pursue additional outside funding that will make these phases more cost effective and affordable. In addition, segments using existing supplies from the PWRP were given priority over segments requiring additional recycled water supplies. The City has existing contractual rights to receive PWRP effluent, while all other future supplies are uncertain at the time of the preparation of this report.

Phases I through IV include all segments that are part of the recommended system and are included within the planning horizon of 2030. Phases V and VI include segments for possible future implementation should the City be able to obtain additional recycled water supplies. The phases and the associated costs are listed in Table 9.4. The recommended system Phases I through IV are shown on Figure 9.2, while the ultimate system Phases V and VI are shown on Figure 9.3.

Table 9.4 Proposed Phasing
Recycled Water Master Plan
City of Pomona

Phases	Phasing Period	Segments	Capital Cost ($millions)	New Demand [2] (ac-ft/yr)	Unit Cost [3] ($/act-ft)
Recommended System					
Phase I	2010-2015	1, and 7 [1]	$2.0	876	$2,055[4]
Phase II	2015-2020	7 [1]	$5.0	74	$4,909
Phase III	2020-2025	7 [1] and 9 [1]	$6.8	172	$2,859
Phase IV	2025-2030	9 [1]	$6.9	375	$1,337
Subtotal			***$20.7***	***1,497***	***$2,171***
Ultimate System					
Phase V	2030-2040	5 and 6	$24.0	658	$2,657
Phase VI	2040-2050	2, 3, 4a, 4b, and 8	$28.0	826	$2,696
Subtotal			***$52.0***	***1,484***	***$2,677***
Grand Total			**$72.7**	**2,981**	**$2,510**

Notes:

(1) Partially included in this Phase.

(2) Based on Average Annual Demand.

(3) Unit costs are based on a 30-year payment period and 6 percent interest.

(4) The $/ac-ft represents the unit cost incurred by the City only. The cost of improvement project, what would be owned and operated by Cal Poly and Forest Lawn, are not included in this value.

9.4.1 Recommended System by Phase

The system expansions that are planned for the period 2010 through 2030 are divided into four 5-year phases, Phase I through Phase IV. The system expansions of the recommended system are described by phase below.

Phase I (2010-2015): Phase I includes the most cost-effective segment, Segment 1 ($368/ac-ft). Segment 1 is less costly than imported potable water supplies and should therefore be implemented as soon as possible to offset reliance on imported water. Phase 1 also includes the initial phase of Segment 7 ($3,444/ac-ft). To keep the overall system cost of Phase I to approximately $2.0 million or $400,000 per year, only a transmission main and a few pipelines that would serve customers 12, 84, and 88 are included in Phase I. This is the portion of Segment 7 that can be served from Zone 1 and does not require the Zone 5 Booster Pumping Station that feeds the remaining portion of Segment 7.

Phase II (2015-2020): Phase II includes the majority of Segment 7 that would extend the recycled water system approximately to Phillips Boulevard, including the Zone 5 Booster Pumping Station, as this portion of Segment 7 is part of Zone 5. The system expansion of this Phase was limited to a total cost of approximately $5 million, assuming that the City would be able to secure some outside funding to implement the extension of Segment 7 as far as possible.

Phase III (2020-2025): Phase III includes the remainder of Segment 7 and a portion of Segment 9. The last portion of the Segment 7 extension would reach SR-71 and allow the City to serve customers 50, 77, and L (Caltrans connection at Rio Rancho Road). The recycled water system would then be expanded to the west of SR-71 and serve the Phillips Ranch area that would still be part of Zone 5. The overall system cost of these expansions is estimated at $8.4 million and would therefore require a further increase in recycled water funds, either generated by rates and/or outside funding. It is assumed that the opportunities for funding would increase in the next decade to accommodate the increase in annual recycled water system expansion costs.

Phase IV (2025-2030): Phase IV includes the remainder of Segment 9 and serves all potential customers in the Phillips Ranch area that were identified as part of this study. This Phase includes the Zone 6 Booster Pumping Station and reaches the customers along Village Loop Road. The overall system cost of these expansions is estimated at $6.9 million, which is comparable to Phase III when considering escalation due to inflation (see Figure 9.5). Hence, a similar level of revenue generation from rates and outside funding would be required to implement these projects.

9.4.2 Ultimate System by Phase

The system expansions that are planned for the period 2030 through 2050 are divided into two 10-year phases, Phase V and Phase VI. These phases would require additional recycled water supplies, as the existing supply capacity from the PWRP would be reached to serve the City's existing customers and the potential customers through Phase IV under maximum day demand conditions. The system expansions of the ultimate system are described by phase below.

Phase V (2030-2040): Phase V includes Segments 5 and 6 to connect the City's recycled water system to the potential new supply from the IEUA. The IEUA could potentially deliver recycled water to the City's boundary on the east part of the City through their San Antonio Channel Pipeline. As shown on Figure 9.3, it is assumed that this connection would be located somewhere between San Bernardino Avenue and Lincoln Avenue. The system pressure of this connection would be sufficient to serve Segment 5, which is identified as Zone 4. Segment 6 is located at a lower elevation, but pumping would be required because this segment requires a reservoir for balancing demands with IEUA supply. The pumping would be used to supply water from the reservoir into a pressurized system. Segments 6 and 7 would be hydraulically connected in this Phase, allowing PWRP and IEUA supplies to mix. The system expansions of this phase could therefore also be supplied from the PWRP, if IEUA supplies would not be realized and the PWRP would be increased in capacity instead. As water would then flow in the opposite direction, a pump station would be required to move water from Zone 5 (Segment 6) to Zone 4 (Segment 5). The overall system cost of these expansions is estimated at $24.1 million, which is more than double the annual cost of Phase IV. This Phase would therefore require a further increase in recycled water funds; either generated by rates and/or outside funding or would need to be spread out over a longer period, e.g. 20 years. As this Phase is outside the planning horizon of this master plan, the actual phasing of these system expansions would be discussed in future master plan updates.

Phase VI (2040-2050): Phase VI includes all remaining segments that would create a looped system through the northern part of the City, including Ganesha Park and some additional customers north of Interstate 10 (I-10). This northern system expansion is divided into Segments 3, 4a, and 4b. In addition, this Phase would expand the system to the southwest (Segment 2) and add another system expansion in the south of the City that would serve three Caltrans connections along SR-60 (Segment 8). The overall system cost of these expansions is estimated at $26.7 million, which is comparable to Phase V. Hence, a similar level of revenue generation from rates and outside funding would be required to implement these projects. Similar to Phase V, this phase may need to be spread out over a longer period, depending on available revenues and funding opportunities.

Table 9.5 provides a summary of the customers connected in each phase.

Table 9.5 Customers Connected by Phase
Recycled Water Master Plan
City of Pomona

Phase	Segments	ID	Customer Name	ID	Customer Name
Phase I	1, 2, and 7 (1)	22	Brown Grandstands Inc	34	Structure Composites
		45	Kellogg Park	26	Gemini Aluminum Corporation
		35	W.R. Meadows Inc.	28	Lanterman Hospital (2)
		25	Ecoplast Corp	88	Pomona Vocational
		3	Cal Poly Pomona	84	Park West High
		7	Forest Lawn	12	Estates-Pomona Westland
Phase II	7 (1)	80	Madison Elementary	79	Lopez Elementary
		48	Madison Park	81	Mendoza Elementary
		95	Vejar Elementary	57	Ralph Welch Park
Phase III	7 (1) and 9 (1)	50	MLK Jr. Memorial Park	L	71 & Rio Rancho Rd.
		77	Lexington Elementary	11	Country Park Villas
		70	Fremont Middle	15	Phillips Meadow
		72	Garey Senior High	16a	Phillips Ranch - Rio Rancho Rd
Phase IV	9 (1)	G	60 & Phillips Ranch Rd.	16d	Phillips Ranch - Village L. Rd (30-70)
		68	Diamond Ranch Senior High	16e	Phillips Ranch - Village L. Rd (70-100)
		16b	Phillips Ranch - Phillips Ranch Rd	16f	Phillips Ranch - Santa Clara & Trabuco Rd
		16c	Phillips Ranch - Village Loop Rd	40	Country Crossing Park
		54	Phillips Ranch Park	90	Ranch Hills Elementary
		67	Decker Elementary		
Phase V	5 and 6	51	Montvue Park	96	Village Academy (HS)
		82	Montvue Elementary	20	Braun Linen Service
		76	Kingsley Elementary	23	California Acrylic Industries
		92	San Antonio Elementary	31	Recycled Wood Products
		69	Emerson Middle	60	Washington Park
		47	Lincoln Park	63	Alcott Elementary
		42	Garfield Park	94	Simons Middle
		89	Pueblo Elementary	9	Pomona Cemetery

Note:

(1) This segment is only partially developed in this phase. See Figures 9.1 and 9.3 for details.

(2) It is unlikely that this customer can be connected to the recycled water system in the near future due to the State's current budget constraints.

Table 9.5 Customers Connected by Phase Recycled Water Master Plan City of Pomona					
Phase	**Segments**	**ID**	**Customer Name**	**ID**	**Customer Name**
Phase VI	3, 4a, 4b, and 8	29	Pomona Fairplex	C	10 & Garey
		41	Ganesha Park	30	Pomona Valley Hospital MC
		E	10 & White	93	San Jose Elementary
		75	John Marshall Middle	99	Yorba Elementary
		44	John F. Kennedy Park	D	10 & Towne
		71	Ganesha Senior High	87	Pomona Senior High
		B	10 & Fairplex	85	Philadelphia Elementary
		65	Arroyo Elementary	53	Philadelphia Park
		58	Ted Greene Park	73	Garey Village (HS)
		83	Palomares Middle	J	71 & Garey
		52	Palomares Park	I	60 & Towne
		87	Pomona Senior High	H	60 & Reservoir Rd.

Note:

(1) This segment is only partially developed in this phase. See Figures 9.1 and 9.3 for details.

(2) It is unlikely that this customer can be connected to the recycled water system in the near future due to the State's current budget constraints.

9.5 CIP IMPLEMENTATION BY PHASE

The phasing of capital cost by project phase is shown on Figure 9.4 (2009 dollars). The estimated escalated capital project costs are shown in Figure 9.5. Cost escalation is calculated with a 3-percent inflation rate and using the mid-year of each planning phase. For example, the mid-year of Phase I is mid-2012. Using a base year of mid-2009, the capital cost of Phase 1 (2.1 million) is escalated for a 3-year period and 3-percent cost inflation (thus equating to an escalation factor of 1.09 ($1.03^{\wedge 3}$)). Consequently, the resulting escalated cost is $2.3 million for Phase I. The cost by phase in 2009 dollars and the escalated costs are also summarized in Table 9.6.

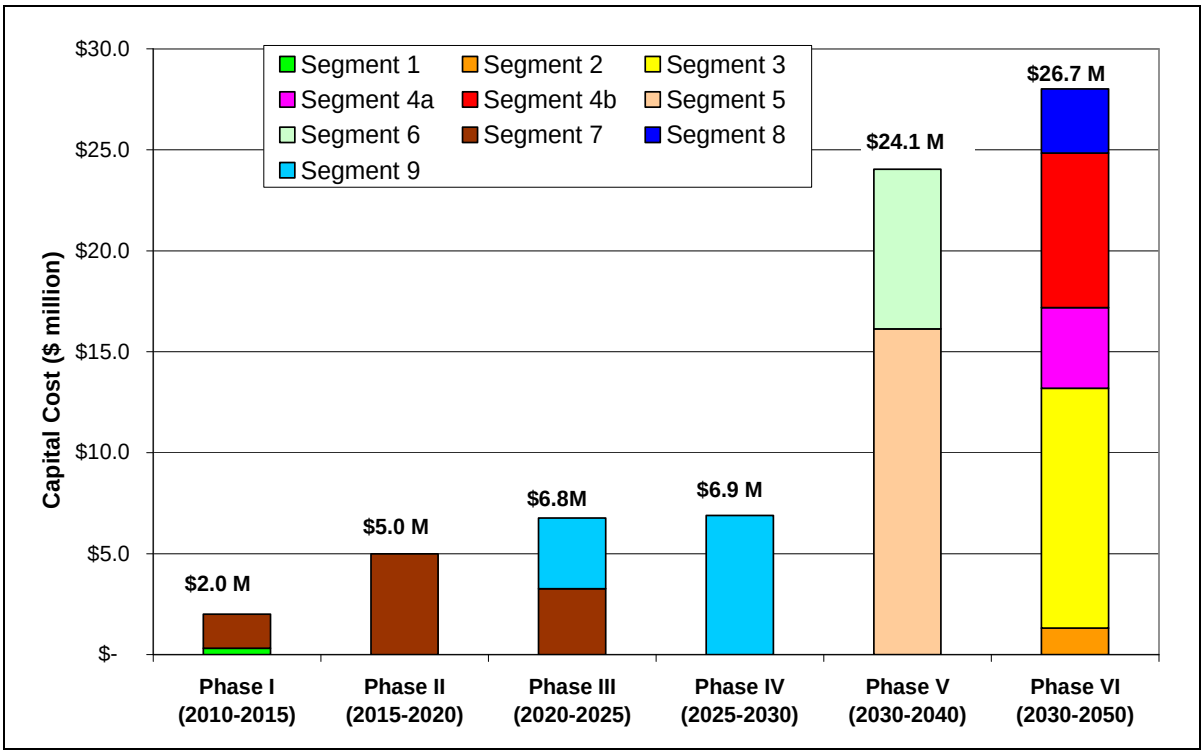

Figure 9.4 Phasing of Capital Cost by Phase

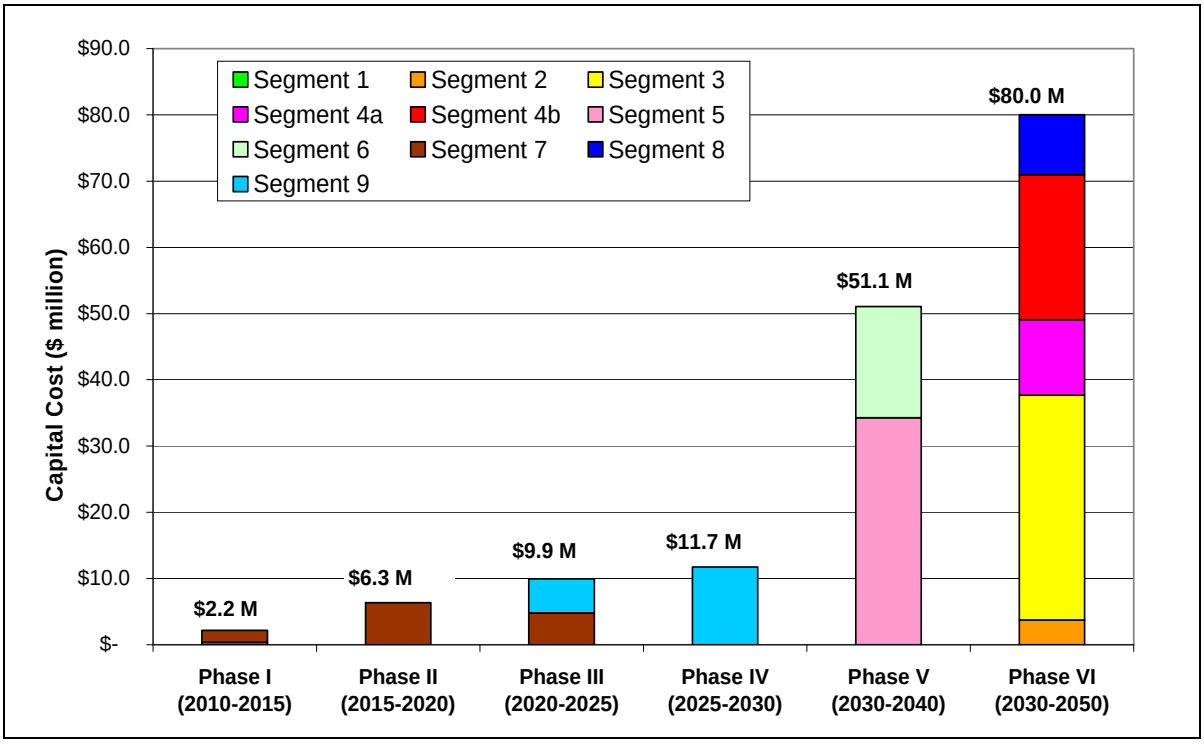

Figure 9.5 Phasing of Escalated Capital Cost by Phase

Table 9.6 Project Cost by Phase Recycled Water Master Plan City of Pomona				
Phases	**Year**	**Segments**	**Capital Cost in 2009 Dollars ($millions)**	**Escalated (1) Capital Cost ($millions)**
Recommended System				
Phase I	2010-2015	1 and 7 (1)	$2.0	$2.2
Phase II	2015-2020	7 (1)	$5.0	$6.3
Phase III	2020-2025	7 (1) and 9 (1)	$6.8	$9.9
Phase IV	2025-2030	9 (1)	$6.9	$11.7
Subtotal			***$20.7***	***$30.1***
Ultimate System				
Phase V	2030-2040	5 and 6	$24.0	$51.1
Phase VI	2040-2050	2, 3, 4a, 4b, and 8	$28.0	$80.0
Subtotal			***$52.0***	***$131.1***
Grand Total			**$72.7**	**$161.2**

Note:
(1) Escalation is based on 3 percent inflation rate and using mid-year of each phase.

9.6 FUNDING

Funding large initial capital costs is a primary constraint in implementing many recycled water projects. Rarely does a city or agency have sufficient revenue to fund large capital improvement projects directly from fees, known as pay-as-you-go financing. Therefore, it is common to use additional financing instruments to meet necessary funding requirements. The main funding and financing instruments available to the City of Pomona are:

- Pay-As-You-Go Financing
- Debt Financing
- Grants and Loan Programs

Each of these instruments is described in the following sections.

9.6.1 Pay-As-You-Go Financing

Pay-as-you-go financing involves periodic collection of capital charges or assessments from customers within the municipality's jurisdiction for the funding of future capital improvements. These revenues are accumulated in a capital reserve fund and are used for capital projects in future years. Pay-as-you-go financing can be used to finance 100 percent or only a portion of a given project.

One of the primary advantages of pay-as-you-go financing is that it avoids the transaction costs (e.g., legal fees, underwriters' discounts, etc.) associated with debt financing alternatives. Conversely, there are two common disadvantages associated with this method. First, capital costs are usually too large to cover within the project timeframe without charging existing users elevated rates. Second, it may result in inequity due to existing customers would be paying for facilities that would primarily benefit future customers.

There are avenues available to the City to use pay-as-you-go financing. These avenues include utility fees and development charges.

9.6.1.1 Utility Fees

Utility fees or benefit assessments (sometimes called service fees or user fees) consist of a fee imposed on each property in proportion to the service provided to that property. They are inherently flexible, in that the agency can select any assessment method that equitably relates the amount charged to the service provided. Utility fees are usually billed on a monthly or bi-monthly interval. The City has the authority to collect a benefit assessment only after approval by a majority of the voters, affected property owners, or rate payers. Benefit assessment fees are usually included as a separate line item on the annual property tax bill sent to each property owner.

9.6.1.2 Development Charges/Connection Fees

The system development charges/connection fees (impact fees) represent the cost of providing regional conveyance and treatment facilities to serve the new recycled water customers. They are one-time fees charged to customers at the time of system connection approval or permit/contract issuance. The charges for individual properties may be based on whatever assessment measures the agency desires for equity.

A disadvantage to utilizing impact fees is that the fees cannot be collected until the system construction permit stage at the earliest. The amount collected each year depends solely on the rate of growth of the recycled water system. Consequently, funds may not be available to construct new capacity at the time it is needed. It is important to note that the City is currently at approximate full build-out, with smaller fill in projects to date.

9.6.2 Debt Financing

Debt financing refers to the acquisition of funds by borrowing. Debt financing requires the City to raise money for working capital or capital expenditures by selling bonds, bills, or notes to individual and/or institutional investors. In return for lending the money, the individuals or institutions become creditors and receive a promise to repay principal and interest on the debt.

Bonds used for financing public works projects are generally local government tax-exempt bonds. The bond issuance process can span between six months and two years depending on how well prepared the City is and how often the City finances debt through the bond market. If recent financial forecasts are available, the bond issuance process is relatively simple. Existing documents will be verified to facilitate planning and structuring the issuance. However, if the City's financial statements are not up to date, financial planning must be completed. The City must also have its credit rating reviewed and publish notice of the upcoming bond sale. Sale of the bond can then be negotiated with an underwriter or be submitted for competitive bid. Types of bonds available to the City for debt financing include revenue bonds and general obligation bonds.

9.6.2.1 Revenue Bonds

Revenue bonds are historically the principal method of incurring long-term debt. This method of debt obligation requires specific non-tax revenues pledged to guarantee repayment. Revenue bonds are not considered general obligations of the issuer because non-tax revenues (user charges, facility income, etc.) are the bondholder's sole source of repayment. Revenue bonds are secured solely by a pledge of revenues. Usually the agency's revenues are derived from the facility that the bonds are used to acquire, construct, or improve. There is no legal limit on the amount of authorized revenue bonds that may be issued, but the size of the issue must be well within the revenues available for debt service on the bonds. Revenue bond covenants generally include coverage provisions, which require that revenue from fees minus operating expenses be greater than debt service costs.

9.6.2.2 General Obligation Bonds

General obligation (GO) bonds are municipal securities backed by the issuer's pledge of its full faith, credit, and taxing power. GO bonds are often repaid using utility revenues when issued in support of a sewer or water enterprise fund.

9.6.2.3 Proposition 218 requirements

The City should be aware that Proposition 218 might limit some of the above funding sources. Effective July 1, 1997, Proposition 218 imposed restrictions on all property-related fees. Following the decision on the Bighorn Case on July 24, 2006, the Supreme Court ruled that Proposition 218 does apply to fees based on measured consumption of a utility service. Revenues from water, sewer, and government trash service charges are governed by Proposition 218's rules. These generally require that:

- Rates are not to exceed the cost of providing the service and the rate proceeds be used only to provide the service.
- The amount of a fee or charge imposed upon any parcel or person as an incident of property ownership shall not exceed the proportional cost of the service attributable to the parcel.

- Transfers from utility accounts into an agency's general fund be justified as repayment of a loan to the utility by the general fund or as reimbursement to the general fund of the cost of services provided to the utility. Previous appellate decisions involving Roseville and Fresno suggest such charges might include the cost of police and fire protection of utility property and the wear and tear on public streets attributable to utility operations.

9.6.3 Grant and Loan Programs

Grant and loan programs should be pursued when feasible since grants are essentially "free money" and loans through state programs typically offer low interest rates and generous repayment terms. However, the City should be aware that competition for funds is often stiff and reporting and compliance requirements could be burdensome.

The following sections provide information regarding local, state, and federal grants and loans for recycled water projects.

9.6.3.1 Local Grants

Local Resources Program

The Metropolitan Water District of Southern California (MWDSC) initiated the Local Resources Program to develop water recycling projects and groundwater recovery projects in its service area. The program's goal is to prevent further demand on the MWDSC imported water supplies and to offset existing demand. To accomplish these goals, the program will fund new projects and expansion projects that directly replace potable water or increase regional groundwater production. The program offers incentive payments of up to $250 per acre-foot produced over a 25-year term. The incentive rate is based on unit costs in ac-ft/yr. The difference between the proposed project unit cost and the MWDSC rate is paid as an incentive, capped at $250 per acre-foot. Incentives are recalculated annually based on eligible project costs incurred each year. Table 9.7 below shows the rates the MWDSC uses for calculating incentive payments.

The application is generic, consisting of a project report that describes project costs, benefits, California Environmental Quality Act (CEQA) compliance, and the recycled water user base. The MWDSC will accept Project Reports that have been developed for other purposes including for other funding applications such as for Bureau of Reclamation's Title XVI program (see Section 8.8.3). Applications are accepted continuously and the funding approval process can take approximately three to six months. This includes time for the approval from both the applicant's governing body and the MWDSC Board of Directors.

Table 9.7 Summary Financial Analysis Recycled Water Master Plan City of Pomona			
Fiscal Year	**Water Rate for LRP Calculation**	**Fiscal Year**	**Water Rate for LRP Calculation**
2009/2010	$684	2020/2021	$1,145
2010/2011	$798	2021/2022	$1,180
2011/2012	$882	2022/2023	$1,215
2012/2013	$905	2023/2024	$1,252
2013/2014	$932	2024/2025	$1,289
2014/2015	$959	2025/2026	$1,328
2015/2016	$988	2026/2027	$1,368
2016/2017	$1,018	2027/2028	$1,409
2017/2018	$1,048	2028/2029	$1,451
2018/2019	$1,080	2029/2030	$1,494
2019/2020	$1,112	2030/2031	$1,539

Notes:
(1) Information based on MWD Local Resource Program contact, see Appendix A.

9.6.3.2 State Grants and Loans

Water Recycling Funding Program

One option for financing Pomona's water recycling projects is the Water Recycling Funding Program administered by the California State Water Resources and Control Board (State Board). Eligible uses of funds include research, feasibility studies, planning, and construction activities related to water reuse. The program utilizes one application to directly fund projects through grants backed by propositions or to offer loans through the Clean Water State Revolving Fund (CWSRF). The funding sources offered to each project are determined by the project's expected water supply benefits. Pomona's projects will most likely qualify for Proposition 13 (Prop 13) funding and the CWSRF.

Prop 13 grant funding was initiated by the 2000 Bond Law and all preliminary funds authorized by the proposition have been exhausted. However, the funding source remains active due to loan repayments from past financing agreements. These funds are typically available for research, planning, and construction efforts. In a typical year, the maximum award for construction grants is 25 percent of eligible construction costs, up to $5 million. The maximum award for planning grants is 50 percent of costs, up to $75,000. The maximum award for research grants is unknown.

As mentioned above, loans for the Water Recycling Funding Program are disbursed through the CWSRF. As of March 2009, the CWSRF expanded its eligibility to cover both construction costs and planning costs. Thus, planning efforts are now able to receive both

Prop 13 grants and CWSRF loans. Planning loans will be offered for project reports, financial analyses, environmental impact analyses, capital improvement plans, water conservation plans, and other planning activities. Planning funds may be used over a three-year period, during which time the interest rate is set at zero. The debt may be repaid as standalone debt or refinanced as part of a construction loan. In total, the maximum annual loan amount is $50 million per agency. The interest rate is set at one half of the state's most recent general obligation bond rate and has historically averaged around 2.5 percent.

Status: For FY 2009/2010, it is expected that the state legislature will prevent the disbursal of construction grants due to state budget shortfalls. Program administrators expect that planning and research grants backed by Prop 13 will be unaffected by the state budget crisis. One consequence of a possible freeze on Prop 13 construction disbursals is that a surplus of funding may be available in upcoming years.

Application: The Prop 13 planning grants have a simple application and a relatively short turnaround time from the State Board. The application consists of a one-page form requesting basic information, an authorizing resolution, and a Plan of Study. Within 30 days after submission of the application, the State Board will issue a letter acknowledging that the application was received. 60 days after the application has been submitted, the Board will approve the Plan of Study, and within the following 30 days, the funding agreement will be executed.

The Water Recycling Funding Program uses a two-part application for loan funding. First applicants submit a short application with basic project details. This places the project on the CWSRF Project Priority List (PPL), which must be approved by the State Board. Applicants then submit a more detailed application to be considered for funding. The full application includes a Financial Assistance Form, Facilities Plan (project report, environmental documents, financing plan, and recycled water market assurances), Water Conservation Plan, and an authorizing resolution from the applicant's governing body. Upon review of the application, a funding commitment is issued. Following the submittal of final plans and specifications and construction bid packages, the loan funds are disbursed. For several recent Clean Water projects, this process has taken approximately one year from the submittal of the preliminary application to the approval of the funding commitment.

Integrated Regional Water Management Grants Program

Integrated Regional Water Management (IRWM) Grant Program, administered by the California Department of Water Resources (DWR), provides funds to a wide range of water quality, supply, and reliability projects and planning. The dual goals of the program are to foster water supply planning efforts at a regional scale and to promote the creation of interagency partnerships. Planning grants are disbursed to assist partnerships in developing IRWM Plans. Recipients of the planning grants may then be invited by the DWR to submit an application for Implementation Grants for the capital projects identified in the

IRWM plan. Recycled water projects could most likely qualify for funding if positioned as water offsets.

Current Status: The program is not currently accepting applications, but the funding source, Proposition 84, is reported to have funds available for future application cycles. The maximum award offered during past application cycles was $25 million per project.

Application: Based on past funding cycles and notices released by the DWR, the application cycle for both the Planning and Implementation Grant could span the better part of a year. Over the first few weeks, the DWR will likely hold workshops to inform potential applicants of the program requirements. To receive planning grants, applicants must submit pre-applications that explain the concept of the proposed planning effort. The DWR selects applicants from the pool for further consideration and holds informal meetings to resolve any outstanding issues. Applicants are then invited to submit a full application. The DWR reviews the applications and submits them for public review before making a funding commitment. The application cycle for Implementation Grants is similar except that only those who have formally adopted IRWM Plans are eligible to apply for Implementation Grants.

For the Planning Grant application, applicants must also provide authorizing documentation, a work plan, and descriptions of how the project will address environmental justice, project impacts and benefits, and integration of water management strategies. The application for Implementation Grants is more involved, requiring explanations of the scientific merit of the project, performance measures, economic analysis, and a description of how the project supports state planning priorities. In addition, applicants must submit CEQA documentation.

New Local Water Supply Program

The New Local Water Supply Program, administered by the DWR offers funding for the feasibility studies and the construction of facilities to increase local water supplies. Eligible projects include canals, dams, reservoirs, desalination facilities, groundwater extraction facilities, or distribution facilities that will improve existing water supply problems. Feasibility studies are provided loans with a maximum award of $500,000 per project. Construction loans are capped at $5 million per project with interest set at the rate of the state's most recent general obligation bond rate (twice the rate offered by the CWSRF). As with the IRWM grant program, water reuse projects could likely qualify for funding for all or a portion of project cost if positioned as providing water offset benefits.

Current Status: It should be noted that the program is not offering new funding agreements in the near future due to the state budget crisis. However, program administrators are suggesting that projects continue to submit applications so that they can be reviewed and ranked in the interim. Once the state budget has been resolved, the project can be quickly issued a funding agreement.

Application: The application for feasibility study funding requires financial documentation, including cost descriptions, the applicant's recent financial statements, cash reserves, existing debt, and rate and service structure information. The applicant must also submit a work plan, schedule, and project description. Financial need for the loan must be demonstrated, as well as need for the additional water supply (e.g. the impacts of not doing the project, unavailability of substitute supplies).

The loan application process occurs over two phases: an initial phase to establish eligibility and a secondary phase during which the application is completed. The eligibility phase requires the submittal of the financial documents listed above as well as a project description with cost information. The second phase requires the submission of engineering and hydrologic feasibility documents, economic justification for the project, project benefits, need for the project, and environmental documentation. The review process for New Local Water Supply Loans occurs over a six-month period.

Future Opportunities

The state budgetary crisis has greatly affected state grant programs. Most proposition-backed grant programs have been suspended until the state's financial situation is resolved. However, these programs could be reactivated in the near future to provide additional funding opportunities.

9.6.3.3 Federal Grants

Title XVI

The U.S. Bureau of Reclamation (USBR) administers funds for recycled water feasibility, demonstration, and construction projects through the Reclamation Wastewater and Groundwater Study and Facilities Act of 1992 (Title XVI) and its amendments. Title XVI provides funding for a variety of water recycling activities, specifically, projects that postpone the development of new water supplies, reduce diversions from natural watercourses, reduce demand on federal water supply facilities, or have a regional or watershed perspective.

Title XVI provides as much as 25 percent of construction costs with a maximum of $20 million per project.

Application: The application for funding consists of a feasibility report submitted to the USBR with documentation of the following elements:

- The need for project, and a description of the problem it is solving
- Water reuse opportunities in the project area including the amount of water that could be recycled, reuse technology that is available or applicable to the project, and potential uses of recycled water
- Discussion of project alternatives including a description, economic analysis, and environmental analysis

- Project implementation needs including legal and institutional requirements and environmental compliance
- Dedicated funding sources for construction costs not covered under Title XVI

Each Title XVI funding cycle can span over several years, due to the lengthy federal appropriations process. Once the feasibility report has been approved by the USBR, Congress must provide authorization for the project. Next, the USBR recommends the project in its annual budget request to the President. If approved, Congress may appropriate funding. The USBR responsibility then shifts to ranking and prioritizing the projects in its budget request, disbursing funds, and providing program management.

Appropriations

The American Recovery and Reinvestment Act (ARRA) of 2009 provided a one-time influx of funding to the Drinking Water State Revolving Fund (SRF) and Clean Water SRF programs. The opportunity to apply for these funds has passed, but related funding sources may be available in the future.

One possible, though unlikely, source of funds is “left over” ARRA monies. ARRA states that any funds that have not been expended by the legislated deadline of February 2010 will be redistributed to states with project need. To date, ARRA funding has been vastly over-requested in many states making it unlikely that a sizable portion will remain for redistribution.

However, one consequence of the ARRA funding cycle has been that it demonstrated the outstanding funding needs of water and wastewater infrastructure. Congress has responded by considering an additional appropriation bill. The Senate Environment and Public Works Committee has approved a bill reauthorizing the Drinking Water and Clean Water State Revolving Fund programs, which would vastly increase funding levels to these programs. If signed into law, the Water Infrastructure Financing Act, as the bill is currently known, will provide up to $35 billion for the programs over the next five years.

Summary

The various grant and loan opportunities available to the City are summarized in Table 9.8.

Table 9.8 Grant and Loan Resource Summary
Recycled Water Master Plan
City of Pomona

Organization	Program	Type	Description	Max Award	Timeframe [1]
Local Funding					
Metropolitan Water District of Southern California	Local Resources Program	Grant	Incentive payments for projects that reduce demand for imported water, specifically recycled water projects and groundwater production projects.	Incentive payment of up to $250 per ac-ft produced per year, over a 25-year term.	3 to 6 months
State Funding					
State Water Resources and Control Board	Water Recycling Funding Program (SRF, Prop 13)	Grant, Loan	Grants typically offered for feasibility studies, planning, research, and construction for recycled water projects. For FY 2009/2010, grants will not be given for construction costs. Loans are available through the State Revolving Fund to finance feasibility studies, planning, and construction. The interest rate is set at half of the State's General Obligation Bond rate and should be approximately 2.5%.	For construction grants, 25% of construction costs, up to $5 million. For planning grants, 50% of costs, up to $75,000. The maximum award for research grants is unknown. $50 million per year for loans.	3 months for planning grants Up to 1 year for construction loans
Department of Water Resources	Integrated Regional Water Management Grants Program (Prop 84)	Grant	Grants for both planning and implementation projects. Agencies are encouraged to form partnerships for the development of Integrated Regional Water Management Plans. The goal of the program is to find regional solutions for water quality and supply planning.	Unknown, maximum award will be determined for future application cycles.	Up to 1 year
Department of Water Resources	New Local Water Supply Program (Prop 82)	Loan	Loans for feasibility studies and the construction of facilities to increase local water supplies. Eligible projects include canals, dams, reservoirs, desalination facilities, groundwater extraction facilities, or distribution facilities that will improve existing water supply problems. The interest rate for loans is set at the State's General Obligation Bond rate (typically around 5%).	$500,000 for feasibility studies, $5 million for construction.	6 months
Federal Funding					
US Bureau of Reclamation	Water Reclamation and Reuse Program (Title XVI)	Grant	Funds for recycled water feasibility, demonstration, and construction projects. Projects must be authorized by Congress, recommended by the Bureau of Reclamation, and then appropriated by Congress.	25% of construction costs, up to $20 million.	Up to 2 years for Congressional approval and appropriation of funds

Note:
(1) The time spanning from the submission of the application to the disbursal of funds.

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9.7 FINANCIAL FEASIBILITY

A cash flow analysis was conducted on the proposed phasing to determine its feasibility of the implementation of this CIP. Based on the analyses that are shown in the previous section, the City could potentially pursue $30M in funding. In summary, these funding options include the following:

- $20M from the Bureau of Reclamation Title XVI Program
- $5M from the State Water Recycling Fund Program
- $5M from the MWDSC Local Resources Program

This $30M amount is the maximum amount of outside funding the City could pursue at this time, although as previously discussed; other funding sources could become available as the state economic budget crisis subsides. In order to determine the financial feasibility of the proposed schedule, three scenarios were evaluated.

- Best Case Scenario. Funding from all sources ($30M) and SRF loans.
- Worst Case Scenario. No outside funding and revenue bonds.
- Average Case Scenario. Funding from Title XVI only ($20M) and SRF loans.
- In the future more state funding could be available; meaning the maximum amount of funding could easily exceed $40M for the City. Title XVI is used for the average case scenario because the amount of funding represents an intermediate case between the best and worst case scenario.

9.7.1 Financial Analysis Assumptions

The cash flow analysis for each of the scenarios makes the following assumptions.

- The initial price of SDLAC recycled water is $109/ac-ft. This value is based on City data.
- The initial retail price of the City's recycled water is $513/ac-ft based on the current rate charged by the City.
- The escalation rate is 3 percent per year. This represents the average value of inflation over the past 20 years according to the consumer price index (CPI).
- The escalation rate for the price of SDLAC recycled water is 7.5 percent per year until the year 2020 after which it was reduced to 3 percent. The current 7.5 percent value is based on data provided by the City.
- The escalation rate for the retail price of City's recycled water is 4.5 percent per year until the year 2020 after which it is 2.5 percent. This assumes that the City passes on rate increases from the SDLAC to its customers, but at a slightly delayed pace since rate increases are slightly below SDLAC rate increases.

- The initial price of MWDSC Tier 2 water is $1,000/ac-ft (based on the knowledge that the MWDSC will raise the price to this level by FY 2010/2011).
- The City would initially spend $2.2M in pay-as-you go financing. This amount is based on the City's current budget allocation.
- This analysis does not include this detail due to the complexity involved; however, this amount was considered to offset any possible retrofit costs.

9.7.2 Financial Analysis Overview

The results for each of the three scenarios (best, worst, and average) are summarized in Table 9.9. A more detailed breakdown of each scenario is shown in Appendix I and the O&M costs used in the analysis are shown in Appendix J.

Table 9.9 Summary Financial Analysis Recycled Water Master Plan City of Pomona

Scenario	Net Cost of Recycled Water ($/ac-ft	MWDSC Price ($/ac-ft)	Debt Ratio	Cash Flow	Feasible Phases
Best Case, Year 2040 (1)	$955	$2,500	2.9 (3)	+	I, II, III, & IV
Worst Case, Year 2040 (1)	$1,242	$2,500	1.1 (3)	+	I, II, III, & IV
Average Case, Year 2040 (1)	$1,034	$2,500	2.0 (3)	+	I, II, III & IV

Notes:
(1) Scenario results for year of last feasible phase
(2) Details of this analysis are included in Appendix I
(3) Occurs after the implementation Phase IV

The following criteria was evaluated in each scenario to determine overall feasibility:

- Recycled Water Net Average Cost. The net average cost of recycled water should be less than the MWDSC Tier rate for the scenario to be considered feasible. This condition should exist over almost all fiscal years.
- Debt Service Coverage Ratio. The debt service ratio is the ratio of net revenues (operating revenue less operating expenses) to annual debt service repayments. The debt service coverage ratio should be greater than 1. This indicates that the revenues from the system are greater than the expenses including O&M and debt service payments. Establishing a debt service ratio greater than 1.1 provides lenders with assurance of repayment (Water Environment Federation, *Financing and Charges for Wastewater Systems*, 2004). For the scenario to be feasible, the City needs to maintain a debt service coverage ratio greater than 1.1. Currently the City's debt service ratio is 1.25; consequently, the City has a history of repaying its debts.

- Available Cash. If the debt service ratio is greater than 1, the available cash for the utility should increase. If available cash is not increasing, the City is losing money. For the scenario to be feasible, the City should always have a surplus of cash available.

Each scenario is feasible until implementation of a project phase causes one of the aforementioned criteria to deviate from the desired values previously stated. Therefore, for each scenario, one can identify feasible phases.

9.7.3 Financial Analysis Conclusions

The findings of the financial analysis as summarized in Table 9.9 are described below. Details on the financial analysis are included in Appendix I.

9.7.3.1 Best Case Scenario

Table 9.9 shows the summary for the best case scenario. For this scenario, the City has been able to secure the maximum amount of outside funding and SRF loans are secured. According to the table, the net average cost of recycled water is far below the MWDSC Tier 2 cost. In addition, the debt service coverage ratio is 1.1 or greater, and the available cash is increasing. If the City is able to secure all potential funding, it is feasible to implement all of the recommended phases. In addition, if additional supply becomes available, Phases V and VI may also be implemented.

9.7.3.2 Worst Case Scenario

Table 9.9 shows the summary for the worst case scenario. For this scenario, the City is unable to secure outside funding and revenue bonds are used instead of SRF loans. According to the table, the net average cost of recycled water starts to approach the MWDSC Tier 2 rate when Phase IV is implemented. Nevertheless the recycled water remains significantly cheaper. In addition, the debt service coverage ratio is still above 1 for Phase IV. Consequently, the implementation of Phase I, II, III, and IV could occur, but the implementation of Phase IV is still questionable since the debt ratio is near 1.1; so the City will have to assess its funding resources as Phase IV approaches to determine if Phase IV can be implemented without creating a financial burden for the City.

9.7.3.3 Average Case Scenario

Table 9.9 shows the summary. For this scenario, the City is able to secure more than half of the available funding in addition to SRF loans. According to the table, the net average cost of recycled water does not approach the MWDSC Tier 2 rate. Accordingly, this scenario shows that it is feasible to implement Phases I through IV if the City is able to secure more than half the available funding and utilize SRF loans. This could be a very real possibility since in the future more funding should become available as the state budget crisis subsides.

9.8 RECOMMENDATIONS

Due to the increasing scarcity and cost of potable water in Southern California, it is recommended that the City work to implement the CIP schedule presented in this chapter. According to the preliminary schedule for phase implementation and the cash flow analysis, it is feasible for the City to take the necessary actions to start the process for expanding and improving the recycled water system. The City should examine the schedule to determine if the timeframe for applying for funding and completing the necessary documentation is realistic.

The City should plan on implementing Phases I, II and III within the planning horizon of year 2030. Even if funding is not secured, the worst case scenario shows that the costs from debt service and O&M allow for the production of recycled water at a rate that is significantly cheaper than the existing and possible future MWDSC Tier 2 rate. In addition, the net revenue for these phases should exceed net operating costs that include O&M and debt service.

The City can immediately start Phase I since it is within the City's existing two million dollar capital improvement budget for recycled system improvements. Within this two million dollar limit for Phase I, the City can do the following:

- Implement all of Segment 1 including the connection of new customers along the existing system as shown on Figure 9.2. The cost for this segment is in the table below.
- Partially implement Segment 7 including the connection of customers 84, 12 and 88. Construction of solely the transmission main between the existing system and the proposed Zone 5 Booster Pump Station can also be included. The total length of transmission main would be approximately 2,500 feet. The cost for this partial Segment 7 is in Appendix I.

If IEUA supply is available and the City successfully pursues funding, Phase IV is feasible according to the average case scenario since recycled water is produced at a lower cost than the MWDSC Tier 2 rate. In addition, the net revenue for these phases should exceed net operating costs that include O&M and debt service.

The City should not plan on implementing Phases V and VI, but should be aware that these Phases are real possibilities that deserve further consideration and attention in the future.

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Appendix B

MARKET ASSESSMENT INTERVIEW SHEETS

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Engineers...Working Wonders With Water™

ROUTE	

Customer Information Meeting Sheets

Project:	City of Pomona - Recycled Water Master Plan	**Conf. Date:**	July 22, 2008
Customer:	Braun Linen Service	**Issue Date:**	August 15, 2008
Location:	City Hall, Pomona, CA		

Attendees:

City of Pomona:
Vince Carstensen (VC)
Nichole Horton (NH)

Carollo:
Mark Bartlett (MSB)
Tracy Clinton (TC)

Braun Linens:
Peter

Purpose: Market Assessment

Distribution: City of Pomona **File:** 8023A00

Discussion:
The following is our understanding of the subject matter covered in this conference. If this differs with your understanding, please notify us.

System Description and Feasibility

Description	
Braun Linens is located in the eastern part of the City of Pomona (City). Currently, the company has 12 routes and 80 employees. The company is interested in using recycled water.	
Use Type	Cleaning Process
Daily Use	1:00 am to 5:30 pm
Weekly Use	M, Tu, W, Th, F
Potable Water Offset	99%
Projected Growth and Year	Could double in 10 years
Existing Irrigable Acres and Year	N/A
Future Irrigable Acres and Year	N/A

Background

Item	Background
1	The company's business consists of cleaning restaurant linens and medical linens. Currently 90 percent of their business is from restaurants and 10 percent is from medical facilities.
2	The company has a production staff of 60 people in the City.

Summary of Issues and Concerns

Item	Issues/Concerns
1	Braun Linens might possibly need to separate their process water plumbing from their potable water plumbing. Braun Linens needs to investigate how water is supplied to the cleaning process.
2	Braun Linens needs to investigate the compatibility of the recycled water quality with the detergents used in the cleaning process.

Feasibility

Feasibility
Yes this is a feasible customer. Especially if recycled water is supplied from the Inland Empire Utilities Agency.

Action Items for the City

Item	Action Items	Date	Due Date
1	City to gather additional demand data from the customer including: • Plumbing system layout.	7/15/08	08/10/08
2	The City is to investigate possible grants for using recycled water.	7/15/08	08/10/08

Prepared By:

Mark Bartlett, P.E.

MSB:alh

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ROUTE	

Customer Information Meeting Sheets

Project:	City of Pomona - Recycled Water Master Plan	**Conf. Date:**	July 22, 2008
Customer:	Caltrans	**Issue Date:**	August 15, 2008
Location:	City Hall, Pomona, CA		

Attendees:

City of Pomona:
Vince Carstensen (VC)
Nichole Horton (NH)

Carollo:
Mark Bartlett (MSB)
Tracy Clinton (TC)

Caltrans:

Purpose: Market Assessment

Distribution: City of Pomona **File:** 8023A00

Discussion:
The following is our understanding of the subject matter covered in this conference. If this differs with your understanding, please notify us.

System Description and Feasibility

Description	
Caltrans is responsible for maintaining highway medians for the 71, 57, and 10 Freeways in the City of Pomona (City).	
Use Type	Irrigation
Daily Use	2 am to 6 am
Weekly Use	M thru Su
Potable Water Offset	N/A
Projected Growth and Year	N/A
Existing Irrigable Acres and Year	
Future Irrigable Acres and Year	

Background

Item	Background
1	The City currently supplies recycled water to medians along the 57 and 71 Freeways.
2	Caltrans wants to landscape the 10, 57, and 71 Freeway interchanges.
3	Other areas for possible irrigation include the ramps by Forest Lawn Cemetery and North Ranch Road.

Summary of Issues and Concerns

Item	Issues/Concerns
1	Caltrans possibly receive recycled water at a deeply discounted rate. Supplying more recycled water to Caltrans so they may irrigate areas that are not currently irrigated might not be economical when this water may be supplied to customers that are currently using potable.

Feasibility

Feasibility
Time and cost could make it more economical to supply recycled water to other customers within Pomona, especially for some existing on-ramps, which are not currently irrigated.

Action Items for the City

Item	Action Items	Date	Due Date
1	City to gather additional demand data from the City including: • The amount of irrigable acres. • Any future demand projections including the year and the increase or decrease in water use. • City to contact Ed Serabodi to locate currently irrigated ramps, and to locate areas that might be irrigated in the future.	7/15/08	08/10/08

Prepared By:

Mark Bartlett, P.E.

MSB:alh

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ROUTE	

Customer Information Meeting Sheets

Project:	City of Pomona - Recycled Water Master Plan	**Conf. Date:**	July 22, 2008
Customer:	City of San Dimas	**Issue Date:**	August 15, 2008
Location:	City Hall, Pomona, CA		

Attendees:

City of Pomona:
Vince Carstensen (VC)
Nichole Horton (NH)

City of San Dimas:
Krishna Patel

Carollo:
Mark Bartlett (MSB)
Tracy Clinton (TC)

Purpose: Market Assessment

Distribution: City of Pomona **File:** 8023A00

Discussion:

The following is our understanding of the subject matter covered in this conference. If this differs with your understanding, please notify us.

System Description and Feasibility

Description	
The City of San Dimas (San Dimas) is north of the City of Pomona (City). San Dimas is interested in having the City peddle recycled water through Bonelli Park to the San Dimas Canyon Golf Course.	
Use Type	Golf Course Irrigation
Daily Use	
Weekly Use	
Potable Water Offset	N/A
Projected Growth and Year	N/A
Existing Irrigable Acres and Year	
Future Irrigable Acres and Year	

Background

Item	Background
1	San Dimas wants to run a new pipeline in the storm channel right of way that runs from the golf course to Bonelli Park. The Puddingstone Reservoir in Bonelli Park would supply recycled water to the new pipeline.

Summary of Issues and Concerns

Item	Issues/Concerns
1	San Dimas would need to obtain permission from the Los Angeles County Department of Public Works to construct a pipeline in the storm channel.
2	San Dimas would have to coordinate with Bonelli Park for using Puddingstone Reservoir as a recycled water supply.

Feasibility

Feasibility
Supplying recycled water to San Dimas requires coordination among the various Cities and County agencies. Time and cost could make it more economical to supply recycled water to other customers within the City.

Action Items for the City

Item	Action Items	Date	Due Date
1	City to gather additional demand data from San Dimas including: • The amount of irrigable acres. • Any future demand projections including the year and the increase or decrease in water use.	7/15/08	08/10/08

Prepared By:

Mark Bartlett, P.E.

MSB:alh

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ROUTE	

Customer Information Meeting Sheets

Project:	City of Pomona - Recycled Water Master Plan	**Conf. Date:**	July 22, 2008
Customer:	Pomona Fairplex	**Issue Date:**	August 15, 2008
Location:	City Hall, Pomona, CA		
Attendees:	City of Pomona: Vince Carstensen (VC) Nichole Horton (NH) Fairplex: Henry Dwight	Carollo: Tracy Clinton (TC)	
Purpose:	Market Assessment		
Distribution:	City of Pomona	**File:**	8023A00

Discussion:
The following is our understanding of the subject matter covered in this conference. If this differs with your understanding, please notify us.

System Description and Feasibility

Description	
The Pomona Fairplex (Fairplex) is located in the northern part of the City of Pomona (City) above the 10 Freeway. The company has been in the City since 1922 and is interested in using recycled water.	
Use Type	Irrigation and Dust Control
Daily Use	
Weekly Use	
Potable Water Offset	
Projected Growth and Year	
Existing Irrigable Acres and Year	
Future Irrigable Acres and Year	

Background

Item	Background
1	The Fairplex could use recycled water in the southeast area of its campus around the Sheraton Hotel.
2	Currently the Fairplex has a 4,000-gallon water truck that is used for dust control along the track.

Summary of Issues and Concerns

Item	Issues/Concerns
1	Recycled water may not be used for horse washdown water.
2	The use of recycled water for dust control needs to be approved by the Regional Board.
3	The Fairplex intends to increase the amount of on-site ground vegetation.
4	The Fairplex is under a state mandate to replace its current track with a new synthetic turf track that is safer for horses. The existing track with be expanded to 1 mile and will have astroturf in the center.
5	The City may possibly take over the old Simpson Paper recycled water line near the Fairplex. This pipeline could possible be used to supply recycled water.

Feasibility

Feasibility
Yes, this customer could easily be converted to recycled water use.

Action Items for the City

Item	Action Items	Date	Due Date
1	City to gather additional demand data from the Fairplex including: • The amount of recycled water that can offset the current potable water use. • The amount of irrigable acres. • Any future demand projections including the year and the increase or decrease in water use.	7/15/08	08/10/08

Prepared By:

Mark Bartlett, P.E.

MSB:alh

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Customer Information Meeting Sheets

Project:	City of Pomona - Recycled Water Master Plan	**Conf. Date:**	July 21, 2008
Customer:	Forest Lawn Memorial-Parks & Mortuaries and California Polytechnic Institute University, Pomona	**Issue Date:**	August 15, 2008
Location:	City Hall, Pomona, CA		

Attendees:

City of Pomona:
Nichole Horton (NH)
Irma Horvath (IH), Business Development

Forest Lawn Memorial-Parks & Mortuaries
Clint Granath (CG)
Russ Whittenburg (RW)

California Polytechnic Institute University, Pomona:
George A. Lwin

Carollo:
Mark Bartlett (MSB)
Tracy Clinton (TC)

Purpose: Market Assessment

Distribution: City of Pomona **File:** 8023A00

Discussion:
The following is our understanding of the subject matter covered in this conference. If this differs with your understanding, please notify us.

System Description and Feasibility

Description	
Forest Lawn Memorial-Park & Mortuaries (Forest Lawn) and the California Polytechnic Institute University at Pomona (Cal Poly Pomona) are located in the western part of the City of Pomona (City). Currently, Cal Poly Pomona is a subscriber to the existing recycled water system. Cal Poly Pomona has expressed an interest in subscribing to additional recycled water for a planned golf course on the existing Spadra Landfill. Forest Lawn has also expressed an interest in receiving recycled water.	
Use Type	Irrigation
Daily Use	
Weekly Use	
Potable Water Offset	N/A
Projected Growth and Year	N/A (see future irrigable acres)
Existing Irrigable Acres and Year	Forest Lawn – 90 acres AND Cal Poly -
Future Irrigable Acres and Year	Forest Lawn – 251 in year 2160

Background

Item	Background
1	Forest Lawn and Cal Poly Pomona jointly paid for the current university recycled water reservoir.
2	The reservoir at Cal Poly Pomona has a 1.9-million-gallon capacity. Existing stub-outs on the reservoir allow Forest Lawn to connect future pumps.
3	Forest Lawn currently has two 100,000-gallon storage tanks.
4	Forest Lawn an agreement with its potable water purveyor that allows it to purchase recycled water from an outside supplier.
4	Cal Poly Pomona currently has 500 acres with landscaping. Not all 500 acres receive water. An additional 185 acres at the university are used for agriculture.
5	In the past, Cal Poly Pomona converted to recycled water toilets, but was forced to convert back to potable due to regulations.

Summary of Issues and Concerns

Item	Issues/Concerns
1	Cal Poly Pomona wants to irrigate a new golf course on the Spadra Landfill, but the landfill is currently connected to the gravity line recycled water main that is run by the Walnut Valley Water District (WVWD). Cal Poly Pomona could possibly be infringing on a neighboring water district's service area by extending an additional recycled water line to the area.
2	If Forest Lawn is connected to the existing reservoir, Cal Poly Pomona wants to know if the City will still be able to meet the maximum demands of the university's irrigation system. Cal Poly Pomona currently uses 1,200 acre-feet per year.
3	Forest Lawn wants an agreement (50 years is possible) for the delivery of recycled water stated in a letter of intent.
4	Forest Lawn could have the infrastructure in place within 2 years for delivering recycled water from the existing Cal Poly Pomona reservoir.
5	Cal Poly Pomona wants City help in obtaining Municipal Water District grants.

Feasibility

Feasibility
It is feasible to serve Forest Lawn, if the City can show Cal Poly Pomona that the existing recycled water supply to the university will not be affected.
Extending City service to the existing Spadra Landfill for a golf course would require additional meetings with the current jurisdiction serving the landfill in order to determine feasibility.

Action Items for the City

Item	Action Item	Date	Due Date
1	City to gather additional demand data from Cal Poly Pomona including: • The number of irrigable acres. • Any future expansion data including the ultimate number of irrigable acres and the year of expansion.	7/15/08	08/10/08
2	The City to gather from both Cal Poly Pomona and Forest Lawn including: • Use patterns, including hourly and weekly data.	7/15/08	08/10/08
2	City to work on providing a letter of intent for Forest Lawn.	7/15/08	08/10/08

Prepared By:

Mark Bartlett and Inge Wiersema, P.E.

MSB:alh

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ROUTE	

Customer Information Meeting Sheets

Project:	City of Pomona - Recycled Water Master Plan	**Conf. Date:**	July 21, 2008
Customer:	Los Angeles County Parks, Bonelli Park	**Issue Date:**	August 15, 2008
Location:	City Hall, Administration Board Room, Pomona, CA		

Attendees:

City of Pomona:
Nichole Horton (NH)
Irma Horvath (IH), Business Development

Carollo:
Mark Bartlett (MSB)
Tracy Clinton (TC)

Los Angeles County Parks:
Ross Varone (RV)

Purpose: Market Assessment

Distribution: City of Pomona **File:** 8023A00

Discussion:
The following is our understanding of the subject matter covered in this conference. If this differs with your understanding, please notify us.

System Description and Feasibility

Location and Recycled Water Demand	
Frank G. Bonelli Regional Park (Bonelli Park) is located north of the City of Pomona (City) above the 10 Freeway. Bonelli Park is currently a subscriber to the existing recycled water system and has indicated that it has additional supply needs. One recycled water system in Bonelli Park provides recycled water to park landscaping, Mountain Meadows golf course, and the RV Park.	
Use Type	Irrigation
Daily Use	
Weekly Use	
Potable Water Offset	N/A
Projected Growth and Year	N/A (see future irrigable acres)
Existing Irrigable Acres and Year	
Future Irrigable Acres and Year	

Background

Item	System Background
1	Los Angeles County Parks (County Parks) is currently under a mandate to use less potable water and convert to recycled water whenever possible.
2	One recycled water system in Bonelli Park provides recycled water to park landscaping, Mountain Meadows golf course, and the RV Park.
3	Bonelli Park currently has an old pump station for delivering recycled water from the City's distribution system. A pump station built in the 1960s is located near the intersection of Fairplex Drive and the 10 Freeway. The pump station provides recycled water to an overflow tank.
4	In fiscal year 04/05, Bonelli Park purchased 46,334 hcf for $81,350 from the Southern California Water Company.

Summary of Issues and Concerns

Item	Issues/Concerns
1	Bonelli Park currently has an old pump station for delivering recycled water from the City's distribution system. A pump station built in the 1960s is located near the intersection of Fairplex Drive and the 10 Freeway. The pump station provides recycled water to an overflow tank. Bonelli Park may need to upgrade the pump station in order to provide adequate pressure.
2	Bonelli Park currently does not use all acres in the irrigation system due to a lack of water. Water use could potentially increase by 30-percent.
3	County Parks is currently compiling a Master Plan for all parks.

Feasibility

Feasibility
Bonelli Park could be supplied with more water from the City's recycled water system.

Action Items for the City

Item	Action Item	Date	Due Date
1	City to gather additional demand data from Bonelli Park including: • The number of acres served by the irrigation system. • The number of acres currently irrigated. • Any future expansion data including the ultimate number of irrigable acres and the year of expansion. • Use data, including hourly and weekly data.	7/15/08	08/10/08

Prepared By:

Mark Bartlett, P.E.

MSB:alh

Engineers...Working Wonders With Water™

ROUTE	

Customer Information Meeting Sheets

Project:	City of Pomona - Recycled Water Master Plan	**Conf. Date:**	July 22, 2008
Customer:	Lanterman Hospitals	**Issue Date:**	August 15, 2008
Location:	City Hall, Pomona, CA		
Attendees:	City of Pomona: Vince Carstensen (VC) Nichole Horton (NH) Lanterman Hospital: Lloyd Rodriguez	Carollo: Mark Bartlett (MSB) Tracy Clinton (TC)	
Purpose:	Market Assessment		
Distribution:	City of Pomona	**File:**	8023A00

Discussion:
The following is our understanding of the subject matter covered in this conference. If this differs with your understanding, please notify us.

System Description and Feasibility

Description	
Lanterman Hospital is located in the southwest part of the City of Pomona (City). An existing gravity recycled water line not owned by the City runs adjacent to the site. The hospital has indicated an interest in using recycled water.	
Use Type	Irrigation
Daily Use	2 am to 4 am
Weekly Use	2 to 3 times a week
Potable Water Offset	N/A
Projected Growth and Year	N/A
Existing Irrigable Acres and Year	350 acres (of which XX are irrigable?)
Future Irrigable Acres and Year	

Background

Item	Background
1	The hospital has been trying to convert its irrigation system for recycled water use for the past 5 to 7 years
2	The hospital has two reservoirs - one is 250,000 gallons and the other is 750,000 gallons. The smaller reservoir could be converted for recycled water use.
3	The hospital has boilers that could be retrofitted to use recycled water.

Summary of Issues and Concerns

Item	Issues/Concerns
1	The hospital is supplied water from both the City and the Walnut Valley Water District (WVWD). Extending recycled water service to the hospital requires coordination with the WVWD, especially since they own the rights to the recycled water flowing in the gravity line adjacent to the hospital.

Feasibility

Feasibility
Yes, it is feasible if the hospital makes the necessary system changes. The City would need to make sure that they are not encroaching on WVWD's service area.

Action Items for the City

Item	Action Items	Date	Due Date
1	City to gather additional demand data from the hospital including: • The amount of irrigable acres. • Any future demand projections including the year and the increase or decrease in water use.	7/15/08	08/10/08

Prepared By:

Mark Bartlett, P.E.

MSB:alh

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ROUTE	

Customer Information Meeting Sheets

Project:	City of Pomona - Recycled Water Master Plan	**Conf. Date:**	July 21, 2008
Customer:	Pomona Unified School District	**Issue Date:**	August 15, 2008
Location:	City Hall, Pomona, CA		
Attendees:	City of Pomona: Nichole Horton (NH) Pomona Unified School District:	Carollo: Mark Bartlett (MSB) Tracy Clinton (TC)	
Purpose:	Market Assessment		
Distribution:	City of Pomona	**File:**	8023A00

Discussion:
The following is our understanding of the subject matter covered in this conference. If this differs with your understanding, please notify us.

System Description and Feasibility

Description	
The Pomona Unified School District (PUSD) has 35 schools within the City of Pomona (City), which currently use potable water for irrigating sports fields and landscaping.	
Use Type	Irrigation
Daily Use	9 pm to 7 am
Weekly Use	1 to 3 days
Potable Water Offset	Some cooling towers
Projected Growth and Year	N/A
Existing Irrigable Acres and Year	
Future Irrigable Acres and Year	N/A (future expansion not planned at current sites)

Background

Item	Background
1	All schools have irrigation systems and most irrigation systems have separate plumbing. Drinking fountains are not connected to any of the irrigation systems
2	Some schools currently have manual irrigation systems. There are a total of 70 valves.
3	None of the sites have storage, but a few of the sites have cooling towers that could use recycled water.
4	The schools are currently working with the Municipal Water District for funding for irrigation controllers. By 2010, all schools need to be compliant with water saving devices.

Summary of Issues and Concerns

Item	Issues/Concerns
1	Some schools might need additional plumbing to prevent cross connections.

Feasibility

Feasibility
The separate irrigation systems make the schools ideally suited for subscribing to recycled water.

Action Items for the City

Item	Action Item	Date	Due Date
1	City to gather additional demand data from the PUSD including: • The number of irrigable acres. • The size and number of cooling towers at each site. • Additional and future school sites including adult education centers.	7/15/08	08/10/08

Prepared By:

Mark Bartlett, P.E.

MSB:alh

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ROUTE	

Customer Information Meeting Sheets

Project:	City of Pomona - Recycled Water Master Plan	**Conf. Date:**	July 22, 2008
Customer:	Recycled Wood Products	**Issue Date:**	August 15, 2008
Location:	City Hall, Pomona, CA		
Attendees:	City of Pomona: Vince Carstensen (VC) Nichole Horton (NH) Recycled Wood Products: Chris	Carollo: Tracy Clinton (TC)	
Purpose:	Market Assessment		
Distribution:	City of Pomona	**File:**	8023A00

Discussion:
The following is our understanding of the subject matter covered in this conference. If this differs with your understanding, please notify us.

System Description and Feasibility

Description	
Recycled Wood Products is located along the eastern edge of the City of Pomona (City). The company has been in the City for 9 years and is interested in using recycled water.	
Use Type	Industrial Process
Daily Use	5 pm to 4 pm
Weekly Use	M thru F, sometimes Sat.
Potable Water Offset	
Projected Growth and Year	
Existing Irrigable Acres and Year	N/A
Future Irrigable Acres and Year	N/A

Background

Item	Background
1	The company uses water in a mist system in a 1-acre shed that keeps wood moist and also provides dust control.
2	The company uses a separate meter for supplying water to its dust control and mist system. The meter is located off of Grand Avenue.

Summary of Issues and Concerns

Item	Issues/Concerns
1	The company would like a letter of intent from the City.
2	The use of recycled water for dust control needs to be approved by the Regional Board.

Feasibility

Feasibility
Yes, this customer could easily be converted to recycled water use.

Action Items for the City

Item	Action Items	Date	Due Date
1	City to gather additional demand data from the company including: • The amount of recycled water that can offset the current potable water use. • Any future demand projections including the year and the increase or decrease in water use.	7/15/08	08/10/08
2	City to provide a letter of intent to the company.	7/15/08	08/10/08

Prepared By:

Mark Bartlett, P.E.

MSB:alh

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ROUTE	

Customer Information Meeting Sheets

Project:	City of Pomona - Recycled Water Master Plan	**Conf. Date:**	July 22, 2008
Customer:	Structural Composites	**Issue Date:**	August 15, 2008
Location:	City Hall, Pomona, CA		
Attendees:	City of Pomona: Vince Carstensen (VC) Nichole Horton (NH) Structural Composites Chuck	Carollo: Tracy Clinton (TC)	
Purpose:	Market Assessment		
Distribution:	City of Pomona	**File:**	8023A.00

Discussion:
The following is our understanding of the subject matter covered in this conference. If this differs with your understanding, please notify us.

System Description and Feasibility

Description	
Structural Composites is a cylinder manufacturing company located in the western area of the City of Pomona (City). The company has been in the City for the last 25 to 30 years. The customer has expressed an interest in using recycled water	
Use Type	Industrial Process
Daily Use	16 hours/day
Weekly Use	M thru Sat.
Potable Water Offset	
Projected Growth and Year	
Existing Irrigable Acres and Year	N/A
Future Irrigable Acres and Year	N/A

Background

Item	Background
1	The company currently has two plants that are across the street from each other.
2	The company has separate meters for its industrial process and potable water use.
3	The company used to meet DOT hydro-testing requirements. Currently, all water used in the process is run through reverse osmosis first.
4	The company manufacturers gas cylinders. Two processes use water, cylinder cleaning, and a hydro wash.
5	Process piping is copper or CPVC.

Summary of Issues and Concerns

Item	Issues/Concerns
1	Since some of the cylinders are used for breathing apparatuses, there could be issues with using recycled water.

Feasibility

Feasibility
Yes, this customer could be converted to recycled water use if the issues involving the use of recycled water for cylinder cleaning are resolved.

Action Items for the City

Item	Action Items	Date	Due Date
1	City to gather additional demand data from the company including: • The amount of recycled water that can offset the current potable water use. • Any future demand projections including the year and the increase or decrease in water use.	7/15/08	08/10/08

Prepared By:

Mark Bartlett, P.E.

MSB:alh

Engineers...Working Wonders With Water™

ROUTE	

Customer Information Meeting Sheets

Project:	City of Pomona - Recycled Water Master Plan	**Conf. Date:**	July 22, 2008
Customer:	Westland Mobile Home Park	**Issue Date:**	August 15, 2008
Location:	City Hall, Pomona, CA		

Attendees:

City of Pomona:
Vince Carstensen (VC)
Nichole Horton (NH)

Carollo:
Mark Bartlett (MSB)
Tracy Clinton (TC)

Westland Mobile Home Park:
Paula

Purpose:	Market Assessment		
Distribution:	City of Pomona	**File:**	8023A00

Discussion:
The following is our understanding of the subject matter covered in this conference. If this differs with your understanding, please notify us.

System Description and Feasibility

Description	
The Westland Mobile Home Park (Mobile Home Park) is located at the eastern end of the existing recycled water system. The customer has shown an interest in using recycled water, but application at the site is limited.	
Use Type	Irrigation
Daily Use	
Weekly Use	M, W, F
Potable Water Offset	N/A
Projected Growth and Year	N/A
Existing Irrigable Acres and Year	< 1 acre
Future Irrigable Acres and Year	N/A

Background

Item	Background
1	The Mobile Home Park has a half-acre parcel of land located adjacent to Mission Street. The Mobile Home Park also has a greenbelt on 9th Street that is irrigated, but the greenbelt is very small.

Summary of Issues and Concerns

Item	Issues/Concerns
1	A separate plumbing system needs to exist for supplying recycled water for irrigation.

Feasibility

Feasibility
Since the site has a limited amount of irrigation, it would most likely be more cost effective to focus on supplying larger customers with a greater demand.

Action Items for the City

Item	Action Items	Date	Due Date
1	N/A	N/A	N/A

Prepared By:

Mark Bartlett, P.E.

MSB:alh

Appendix C

CUSTOMER INFORMATION LOG

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Appendix C - Customer Information Log
Recycled Water Master Plan
City of Pomona

Site No.[1]	Site Name[2]	Description	Expansion Issues	Use	Hourly Use	Weekly Use (Su M T W Th F Sa)	Potable Water Offset % [3]	Current Potable Water Use (ac-ft/yr)	Projected Potable Water Use (ac-ft/yr)[3]	Existing Irrigable Acres [4]	Future Irrigable Acres And Year [4]
	Existing Customers										
1	City of Pomona- Park Booster	Median strip along S. Campus Park Drive		Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	7.5[5]	N/A
	Ext. Cust. With Additional Supply Needs										
2	Bonelli Park	LA County Park	Existing PS needs rehabilitation. Could exist current use by 30% by irrigating with full existing system.	Irrigation	9 p.m. - 5 a.m. [6]	M-Su [6]	N/A	N/A	N/A	325[5]	90[5] in 2030
3	Cal Poly Pomona	University	New Golf Course Irrigation is in the Walnut Valley Service Area for RW	Irrigation (some areas already use RW)	9 p.m. - 5 a.m. [6]	M-Su [6]	N/A	N/A	N/A	475	125[5] in 2015 for Golf Course
4	SR-57 South Campus. Dr.	near cal poly pomona	Ex. RW customer	Irrigation - Currently Used	9 p.m. - 5 a.m.	M-Su	N/A	N/A	N/A	11	N/A
5	SR-71 South Campus. Dr	near cal poly pomona	Ex. RW customer	Irrigation - Currently Used	9 p.m. - 5 a.m.	M-Su	N/A	N/A	N/A	7.5	N/A
	Caltrans Ramps with Potential Irrigation Demands										
A	10 & Dudley	on-ramp/off-ramp		Irrigation - Currently Used	9 p.m. - 5 a.m.	M-Su	N/A	N/A	N/A	0	1
B	10 & Fairplex	on-ramp/off-ramp		Irrigation - Currently Used	9 p.m. - 5 a.m.	M-Su	N/A	N/A	N/A	0	1
C	10 & Garey	on-ramp/off-ramp		Irrigation - Currently Used	9 p.m. - 5 a.m.	M-Su	N/A	N/A	N/A	0	1
D	10 & Towne	on-ramp/off-ramp		Irrigation - Currently Used	9 p.m. - 5 a.m.	M-Su	N/A	N/A	N/A	0	1
E	10 & White	on-ramp/off-ramp		Irrigation - Currently Used	9 p.m. - 5 a.m.	M-Su	N/A	N/A	N/A	0	1
F	57 & Temple	near cal poly pomona	Ex. RW customer	Irrigation - Currently Used	9 p.m. - 5 a.m.	M-Su	N/A	N/A	N/A	0	
G	60 & Phillips Ranch Rd.	on-ramp/off-ramp		Irrigation - Currently Not	9 p.m. - 5 a.m.	M-Su	N/A	N/A	N/A	0	1
H	60 & Reservoir Rd.	on-ramp/off-ramp		Irrigation - Currently Not	9 p.m. - 5 a.m.	M-Su	N/A	N/A	N/A	0	1
I	60 & Towne	on-ramp/off-ramp	A meter exists but a backflow prevention is needed.	Irrigation - Currently Not	9 p.m. - 5 a.m.	M-Su	N/A	N/A	N/A	0	1
J	71 & Garey	on-ramp/off-ramp		Irrigation - Currently Not	9 p.m. - 5 a.m.	M-Su	N/A	N/A	N/A	0	1
K	71 & Mission	Mostly established plants	New overpass makes this area unnecessary	Irrigation - Currently Not	9 p.m. - 5 a.m.	M-Su	N/A	N/A	N/A	0	1
L	71 & Rio Rancho Rd.	on-ramp/off-ramp		Irrigation - Currently Not	9 p.m. - 5 a.m.	M-Su	N/A	N/A	N/A	0	1
	Potential Customers										
6	San Dimas Canyon Golf Course	Golf Course north of Bonelli Park	Must transfer through Bonelli Park (Puddingstone Reservoir)	Irrigation	9 p.m. - 5 a.m. [6]	M-Su [6]	N/A	N/A	N/A	125[5]	N/A
	Cemeteries										
7	Forest Lawn Mortuary		Must construct PS. Must coordinate with Cal Poly Pomona. Needs letter of intent from City.	Irrigation	9 p.m. - 5 a.m. [6]	M-Su [6]	N/A	N/A	N/A	90	116 in 2030 and 251 in 2063
8	Holy Cross Cemetery		Intends to Use Wells	Irrigation	12 am to 3 am	M-Su	N/A	N/A	N/A	8.5	None
9	Pomona Cemetery		Intends to Use Wells	Irrigation	12 am to 3 am	M-Su	N/A	N/A	N/A	35	None
	Homeowners Association										
10	Amcal Portofino Villas	Senior Apts.		Irrigation	12 am to 5 am	M-Sa	N/A	N/A	N/A	3.7	None
11	Country Park Villas	Apartments		Irrigation	12 am to 5 am	M-Sa	N/A	N/A	N/A	1	None
12	Estates-Pomona Westland	SF Homes	Small soccer field	Irrigation	7 am to 11 am	M, W, F	N/A	N/A	N/A	< 0.5 acres	< 0.5 acres
13	Hermosa Village	Apartments		Irrigation	3 am to 6 am	M-Su [6]	N/A	N/A	N/A	1	None

Site No.[1]	Site Name[2]	Description	Expansion Issues	Use	Hourly Use	Weekly Use (Su M T W Th F Sa)	Potable Water Offset % [3]	Current Potable Water Use (ac-ft/yr)	Projected Potable Water Use (ac-ft/yr)[3]	Existing Irrigable Acres [4]	Future Irrigable Acres And Year [4]
14	Hidden Valley	Apartments		Irrigation	9 p.m. - 5 a.m.	M-Su [6]	N/A	N/A	N/A	6[5]	None
15	Phillips Meadow	SF Homes		Irrigation	9 p.m. - 5 a.m.	M-Su [6]	N/A	N/A	N/A	3	None
16	Phillips Ranch	Master Planned Communities	Has a park trail system; City Maintains riparian area. Each subdivision maintains landscape.	Irrigation	9 p.m. - 5 a.m. [6]	M-Su [6]	N/A	N/A	N/A	18[5]	None
17	Quail Creek Pomona	Townhomes/Condos	Onsite ornamental ponds	Irrigation	10 pm to 3 am	M-Sa	5.00%	70	N/A	7	None
18	Village Gate	SF Homes		Irrigation	9 p.m. - 5 a.m. [6]	M-Su [6]	N/A	N/A	N/A	0.5[5]	None
19	Woodbridge PMA	SF Homes		Irrigation	9 p.m. - 5 a.m. [6]	M-Su [6]	N/A	N/A	N/A	0.5[5]	None
	Industrial/Commercial										
20	Braun Linen Service			Process	1am - 5:30 pm	M, T, Th, F	99.00%	141	282 in 2018	N/A	N/A
21	Angelica Textile Service	Linen Service		Unknown						N/A	
22	Brown Grandstands Inc		Storage for grandstands	Process	8 am to 5 pm [7]	M-F [7]	98.00%	10	Unknown	N/A	N/A
23	California Acrylic Industries	Cal Spas		Process	8 am to 5 pm [7]	M-F [7]	98.00%	32	Unknown	N/A	N/A
24	Mt. San Antonio Gardens (Congregational Homes)	Hospital/Senior Long Term Care	Recently replaced irrigation system with a new envirotranspiration system.	Irrigation	9 p.m. - 5 a.m. [6]	M-W, F, Sa	N/A	N/A	N/A	11.69	Unknown
25	Ecoplast Corp	Plastics Recycling	Possibly Outgrowing current location	Process, onsite recycle process water, have 500 GAL cooling tower	8 am to 5 pm	M-F	98.00%	3	Unknown	N/A	N/A
26	Gemini Aluminum Corporation	Aluminum Manufacturing		Process	8 am to 5 pm [7]	M-F [7]	98.00%	13	Unknown	N/A	N/A
27	Hehr International	Glass Manufacturing		Process	8 am to 5 pm [7]	M-F [7]	98.00%	10	Unknown	N/A	N/A
28	Lanterman Hospital	Hospital maybe could used RW for boilders	Hospital is in the Walnut Valley Service Area for RW	Process and Irrigation	2-4 am	M - Su	Unknown	N/A	N/A	25[5]	Unknown
29	Pomona Fairplex		Is RW okay for Dust Control? Ans - No	Process and Irrigation	9 p.m. - 5 a.m. [6]	M-Su [6]	N/A	N/A	N/A	50+	N/A
30	Pomona Valley Hospital Medical Center	Hospital & Medical Center complex	30-yr specific plan inclusion of RW	Irrigation	9 p.m. - 5 a.m. [6]	M-Su [6]	N/A	N/A	N/A	5	Unknown
31	Recycled Wood Products		Letter of Intent needed from City	Process	5am - 4 pm	M-F, Sa (occ)	98.00%	24	Unknown	N/A	N/A
32	Ripon Cogeneration	No longer active plant.	Producing Distilled Water	Process	N/A	N/A	0.00%	48	Unknown	N/A	N/A
33	Robertson's Ready Mix	Concrete Plant	Currently in process of getting RW	Process & Irrigation	5 am to 6 pm	M - F	98.00%	64	Unknown	N/A	N/A
34	Structure Composites		Need to see if cylinder recycled water washing is okay for breathing apparatuses	Process	16 hrs/day	M-Sa	98.00%	24	Unknown	N/A	N/A
35	W.R. Meadows Inc.	Produce concrete curing compounds		Process (recycle onsite process water, 500-600 gal potable water used for each 1000 gal compound generated.)	8 am to 5 pm	M-F	98.00%	28	Unknown	N/A	N/A
36	West Coast Recycling Services	Recycling Plant	Ex. 95,000 SF building, 4500 SF of landscape, intermitant sprayers inside.	Process / Dust Control	24 hours (on every couple of hours)	M-Su	98.00%	3	Unknown	N/A	N/A

Site No.[1]	Site Name[2]	Description	Expansion Issues	Use	Hourly Use	Weekly Use (Su M T W Th F Sa)	Potable Water Offset % [3]	Current Potable Water Use (ac-ft/yr)	Projected Potable Water Use (ac-ft/yr)[3]	Existing Irrigable Acres [4]	Future Irrigable Acres And Year [4]
Parks											
37	Centennial Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	0.50	0.36
38	Cesar Chavez Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	1.00	0.73
39	Civic Center	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	9.00	0.89
40	Country Crossing Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	8.00	1.05
41	Ganesha Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	60.00	1.07
42	Garfield Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	3.00	1.51
43	Hamilton Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	0.67	2.53
44	John F. Kennedy Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	8.00	2.56
45	Kellogg Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	8.00	2.77
46	Kiwanis Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	5.00	3.03
47	Lincoln Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	3.00	3.25
48	Madison Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	4.00	4.43
49	Memorial Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	2.00	4.58
50	Mlk Jr Memorial Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	5.00	5.05
51	Montvue Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	4.50	5.22
52	Palomares Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	17.50	5.26
53	Philadelphia Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	4.50	5.30
54	Phillips Ranch Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	5.00	5.71
55	Pomona Jaycee Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	6.50	5.98
56	Powers Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	0.74	7.11
57	Ralph Welch Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	10.00	7.36
58	Ted Greene Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	4.20	7.82
59	Veterans Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	11.00	XX
60	Washington Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	14.00	19.16
61	Westmont Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	6.00	20.57
62	Willie White Park	City Park	Are all acres irrigable?	Irrigation	11 pm to 5 am	M-Su	N/A	N/A	N/A	5.00	60.54
Schools			Some do not have separate irrigation plumbing, I.e.								
63	Alcott Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	4.25	Unknown
64	Allison Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	4.9	Unknown
65	Arroyo Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	3.6	Unknown
66	Cortez Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	2.5	Unknown
67	Decker Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	5.5	Unknown
68	Diamond Ranch Senior High	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	42	Unknown
69	Emerson Middle	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	7.65	Unknown
70	Fremont Middle	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	12.72	Unknown
71	Ganesha Senior High	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	11.12	Unknown
72	Garey Senior High	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	19.58	Unknown
73	Garey Village (HS)	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	5	Unknown
74	Harrison Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	4.6	Unknown
75	John Marshall Middle	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	8.69	Unknown
76	Kingsley Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	5.58	Unknown
77	Lexington Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	3.74	Unknown
78	Lincoln Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	2.57	Unknown
79	Lopez Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	2.5	Unknown
80	Madison Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	2.83	Unknown

Site No.[1]	Site Name[2]	Description	Expansion Issues	Use	Hourly Use	Weekly Use (Su M T W Th F Sa)	Potable Water Offset % [3]	Current Potable Water Use (ac-ft/yr)	Projected Potable Water Use (ac-ft/yr)[3]	Existing Irrigable Acres [4]	Future Irrigable Acres And Year [4]
81	Mendoza Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	1.8	Unknown
82	Montvue Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	2.85	Unknown
83	Palomares Middle	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	18.23	Unknown
84	Park West High	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	1	Unknown
85	Philadelphia Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	3.43	Unknown
86	Pomona Alternative (PAS)	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	0.2	Unknown
87	Pomona Senior High	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	19.88	Unknown
88	Pomona Vocational	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	1.5	Unknown
89	Pueblo Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	6	Unknown
90	Ranch Hills Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	3.42	Unknown
91	Roosevelt Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	2.28	Unknown
92	San Antonio Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	4.75	Unknown
93	San Jose Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	4.25	Unknown
94	Simons Middle	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	8.96	Unknown
95	Vejar Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	4.55	Unknown
96	Village Academy (HS)	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	0.5	Unknown
97	Washington Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	1.92	Unknown
98	Westmont Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	2.07	Unknown
99	Yorba Elementary	School	No	Irrigation	9pm - 7am	1- 3 days	N/A	N/A	N/A	3.97	Unknown
	Specific Plans										
100	Western University										
101	Downtown Specific Plan										

Notes:
(1) Site numbers correlate to the site number in Figure 6.
(2) Site numbers correlate to the site number in Figure 6.
(3) Applicable for industrial and commercial processes and is in addition to any irrigation needs
(4) Applicable for irrigation.
(5) Estimated based on aerial photography
(6) Estimated based on average irrigation patterns
(7) Estimated based on average industrial/commericial use patterns

Appendix D

CUSTOMER DEMAND DETAILS

This appendix contains detailed tables for current customer demand (2008) and future (2030) customer demand. Both existing and potential customers are included.

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Appendix D - Future Customer Demand in Year 2030
Recycled Water Master Plan
City of Pomona

Site No.[1]	Site Name[2]	Use[8]	Potable Water Offset % [3]	Current Water Use (ac-ft/yr)	Irrigation Demand Factor	Future Irrigable Acres [4]	ADD (ac-ft/yr)	ADD (mgd)	MMD Peaking Factor	MMD (mgd)
	Existing Customers and Ext. Cust. With Additional Supply Needs									
1	City of Pomona- Park Booster[5]	I	N/A	N/A	2.85	6	17.1	0.015	2.15	0.03
2	Bonelli Park[5]	I	N/A	N/A	2.85	425	1211	1.08	2.15	2.32
3	Cal Poly Pomona	I	N/A	N/A	2.85	536.5	1529	1.4	2.15	2.93
4	SR-57 South Campus. Dr.	I	N/A	N/A	2.85	9	26	0.023	2.15	0.049
5	SR-71 South Campus. Dr	I	N/A	N/A	2.85	18	51.3	0.046	2.15	0.098
			Total			**995**	**2834**	**2.5**		**5.44**
	Caltrans Ramps with Potential Irrigation Demands									
A	10 & Dudley	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
B	10 & Fairplex	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
C	10 & Garey	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
D	10 & Towne	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
E	10 & White	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
F	57 & Temple	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
G	60 & Phillips Ranch Rd.	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
H	60 & Reservoir Rd.	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
I	60 & Towne	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
J	71 & Garey	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
K	71 & Mission	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
L	71 & Rio Rancho Rd.	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
			Total			**48**	**137**	**0.12**		**0.26**
	Potential Customers									
6	San Dimas Canyon Golf Course[5]	I	N/A	N/A	2.85	150	427.5	0.38	2.15	0.82
	Cemeteries									
7	Forest Lawn Mortuary	I	N/A	N/A	2.85	116	330.6	0.29	2.15	0.63
8	Holy Cross Cemetery	I	N/A	N/A	2.85	8.5	24.225	0.022	2.15	0.046
9	Pomona Cemetery	I	N/A	N/A	2.85	35	99.75	0.09	2.15	0.19
			Total			**160**	**455**	**0.41**		**0.9**

Site No.[1]	Site Name[2]	Use[8]	Potable Water Offset % [3]	Current Water Use (ac-ft/yr)	Irrigation Demand Factor	Future Irrigable Acres [4]	ADD (ac-ft/yr)	ADD (mgd)	MMD Peaking Factor	MMD (mgd)
	Homeowners Association									
10	Amcal Portofino Villas	I	N/A	N/A	2.85	3.7	10.545	0.009	2.15	0.020
11	Country Park Villas	I	N/A	N/A	2.85	1	2.85	0.0025	2.15	0.0055
12	Estates-Pomona Westland	I	N/A	N/A	2.85	< 0.5 acres	1.425	0.0013	2.15	0.0027
13	Hermosa Village	I	N/A	N/A	2.85	1	2.85	0.0025	2.15	0.0055
14	Hidden Valley[5]	I	N/A	N/A	2.85	6	17.1	0.015	2.15	0.03
15	Phillips Meadow	I	N/A	N/A	2.85	3	8.55	0.008	2.15	0.016
16	Phillips Ranch[5]	I	N/A	N/A	2.85	0	0	0.000	2.15	0.00
16A	Phillips Ranch - Rio Rancho Rd	I	N/A	N/A	2.85	13.3	37.8	0.034	2.15	0.07
16B	Phillips Ranch - Phillips Ranch Rd	I	N/A	N/A	2.85	16.5	46.97	0.042	2.15	0.09
16C	Phillips Ranch - Village L. Rd (1-20)	I	N/A	N/A	2.85	7.0	20	0.018	2.15	0.04
16D	Phillips Ranch - Village L. Rd (30-70)	I	N/A	N/A	2.85	15.4	44	0.039	2.15	0.08
16E	Phillips Ranch - Village L. Rd (70-100)	I	N/A	N/A	2.85	13.3	38	0.034	2.15	0.07
16F	Phillips Ranch - Santa Clara & Trabuco Rd	I	N/A	N/A	2.85	8.8	25	0.022	2.15	0.05
17	Quail Creek Pomona	I, L	5%	70	2.85	7	23.45	0.021	2.15	0.045
18	Village Gate [5]	I	N/A	N/A	2.85	0.5	1.425	0.0013	2.15	0.0027
19	Woodbridge PMA[5]	I	N/A	N/A	2.85	0.5	1.425	0.0013	2.15	0.0027
			Total	**70**		**97**	**281**	**0.25**		**0.54**
	Industrial/Commercial									
20	Braun Linen Service	P	99.00%	318	N/A	N/A	314.82	0.28	1.6	0.45
21	Angelica Textile Serv	P	99.00%	Unknown	N/A	N/A			1.6	
22	Brown Grandstands Inc	P	97.00%	10	N/A	N/A	9.7	0.009	1.6	0.014
23	California Acrylic Industries	P	97.00%	32	N/A	N/A	31.04	0.028	1.6	0.044
24	Mt. San Antonio Gardens (Congregational Homes)	I	N/A	N/A	2.85	11.69	33.3165	0.030	2.15	0.064
25	Ecoplast Corp	P	98%	3	N/A	N/A	2.94	0.003	1.60	0.0042
26	Gemini Aluminum Corporation	P	97.00%	13	N/A	N/A	12.61	0.011	1.6	0.018
27	Hehr International	P	97.00%	10	N/A	N/A	9.7	0.0087	1.6	0.014
28	Lanterman Hospital[5]	I, P	Unknown	N/A	2.85	25	71.25	0.064	2.15	0.14

Site No.[1]	Site Name[2]	Use[8]	Potable Water Offset % [3]	Current Water Use (ac-ft/yr)	Irrigation Demand Factor	Future Irrigable Acres [4]	ADD (ac-ft/yr)	ADD (mgd)	MMD Peaking Factor	MMD (mgd)
29	Pomona Fairplex	I, P	N/A	N/A	2.85	35	99.75	0.09	2.15	0.19
30	Pomona Valley Hospital Medical Center	I	N/A	N/A	2.85	5	14.25	0.013	2.15	0.03
31	Recycled Wood Products	P	97.00%	27	N/A	N/A	26.19	0.023	1.6	0.037
32	Ripon Cogeneration	P	0.00%	0	N/A	N/A	0	0.00	1.6	0.00
33	Robertson's Ready Mix	I, P	97.00%	64	N/A	N/A	62.08	0.055	1.6	0.089
34	Structure Composites	P	97.00%	24	N/A	N/A	23.28	0.021	1.6	0.033
35	W.R. Meadows Inc.	P	97.00%	28	N/A	N/A	27.16	0.024	1.6	0.039
36	West Coast Recycling Services	P	97.00%	3	N/A	N/A	2.91	0.00	1.6	0.0042
			Total	**532**		**77**	**741**	**0.66**		**1.16**
	Parks									
37	Centennial Park	I	N/A	N/A	2.85	0.50	1.43	0.0013	2.15	0.0027
38	Cesar Chavez Park	I	N/A	N/A	2.85	1.00	2.85	0.0025	2.15	0.0055
39	Civic Center	I	N/A	N/A	2.85	9.00	25.65	0.023	2.15	0.0492
40	Country Crossing Park	I	N/A	N/A	2.85	8.00	22.80	0.020	2.15	0.0437
41	Ganesha Park	I	N/A	N/A	2.85	60.00	171.00	0.15	2.15	0.3279
42	Garfield Park	I	N/A	N/A	2.85	3.00	8.55	0.008	2.15	0.0164
43	Hamilton Park	I	N/A	N/A	2.85	0.67	1.91	0.0017	2.15	0.0037
44	John F. Kennedy Park	I	N/A	N/A	2.85	8.00	22.80	0.020	2.15	0.0437
45	Kellogg Park	I	N/A	N/A	2.85	8.00	22.80	0.020	2.15	0.0437
46	Kiwanis Park	I	N/A	N/A	2.85	5.00	14.25	0.013	2.15	0.0273
47	Lincoln Park	I	N/A	N/A	2.85	3.00	8.55	0.008	2.15	0.0164
48	Madison Park	I	N/A	N/A	2.85	4.00	11.40	0.010	2.15	0.0219
49	Memorial Park	I	N/A	N/A	2.85	2.00	5.70	0.0051	2.15	0.0109
50	Mlk Jr Memorial Park	I	N/A	N/A	2.85	5.00	14.25	0.013	2.15	0.0273
51	Montvue Park	I	N/A	N/A	2.85	4.50	12.83	0.011	2.15	0.0246
52	Palomares Park	I	N/A	N/A	2.85	17.50	49.88	0.044	2.15	0.0957
53	Philadelphia Park	I	N/A	N/A	2.85	4.50	12.83	0.011	2.15	0.0246
54	Phillips Ranch Park	I	N/A	N/A	2.85	5.00	14.25	0.013	2.15	0.0273
55	Pomona Jaycee Park	I	N/A	N/A	2.85	6.50	18.53	0.017	2.15	0.0355
56	Powers Park	I	N/A	N/A	2.85	0.74	2.11	0.0019	2.15	0.0040
57	Ralph Welch Park	I	N/A	N/A	2.85	10.00	28.50	0.025	2.15	0.0547
58	Ted Greene Park	I	N/A	N/A	2.85	4.20	11.97	0.011	2.15	0.0230
59	Veterans Park	I	N/A	N/A	2.85	11.00	31.35	0.0280	2.15	0.0601

Site No.[1]	Site Name[2]	Use[8]	Potable Water Offset % [3]	Current Water Use (ac-ft/yr)	Irrigation Demand Factor	Future Irrigable Acres [4]	ADD (ac-ft/yr)	ADD (mgd)	MMD Peaking Factor	MMD (mgd)
60	Washington Park	I	N/A	N/A	2.85	14.00	39.90	0.036	2.15	0.0765
61	Westmont Park	I	N/A	N/A	2.85	6.00	17.10	0.015	2.15	0.0328
62	Willie White Park	I	N/A	N/A	2.85	5.00	14.25	0.013	2.15	0.027
			Total			**206**	**587**	**0.52**		**1.1**
	Schools									
63	Alcott Elementary	I	N/A	N/A	2.85	4.25	12.1125	0.011	2.15	0.023
64	Allison Elementary	I	N/A	N/A	2.85	4.9	13.965	0.012	2.15	0.027
65	Arroyo Elementary	I	N/A	N/A	2.85	3.6	10.26	0.009	2.15	0.020
66	Cortez Elementary	I	N/A	N/A	2.85	2.5	7.125	0.006	2.15	0.014
67	Decker Elementary	I	N/A	N/A	2.85	5.5	15.675	0.014	2.15	0.030
68	Diamond Ranch Senior High	I	N/A	N/A	2.85	42	119.7	0.107	2.15	0.230
69	Emerson Middle	I	N/A	N/A	2.85	7.65	21.8025	0.019	2.15	0.042
70	Fremont Middle	I	N/A	N/A	2.85	12.72	36.252	0.032	2.15	0.070
71	Ganesha Senior High	I	N/A	N/A	2.85	11.12	31.692	0.028	2.15	0.061
72	Garey Senior High	I	N/A	N/A	2.85	19.58	55.803	0.050	2.15	0.107
73	Garey Village (HS)	I	N/A	N/A	2.85	5	14.25	0.013	2.15	0.027
74	Harrison Elementary	I	N/A	N/A	2.85	4.6	13.11	0.012	2.15	0.025
75	John Marshall Middle	I	N/A	N/A	2.85	8.69	24.7665	0.022	2.15	0.047
76	Kingsley Elementary	I	N/A	N/A	2.85	5.58	15.903	0.014	2.15	0.030
77	Lexington Elementary	I	N/A	N/A	2.85	3.74	10.659	0.010	2.15	0.020
78	Lincoln Elementary	I	N/A	N/A	2.85	2.57	7.3245	0.007	2.15	0.014
79	Lopez Elementary	I	N/A	N/A	2.85	2.5	7.125	0.006	2.15	0.014
80	Madison Elementary	I	N/A	N/A	2.85	2.83	8.0655	0.007	2.15	0.015
81	Mendoza Elementary	I	N/A	N/A	2.85	1.8	5.13	0.005	2.15	0.010
82	Montvue Elementary	I	N/A	N/A	2.85	2.85	8.1225	0.007	2.15	0.016
83	Palomares Middle	I	N/A	N/A	2.85	18.23	51.9555	0.046	2.15	0.100
84	Park West High	I	N/A	N/A	2.85	1	2.85	0.003	2.15	0.005
85	Philadelphia Elementary	I	N/A	N/A	2.85	3.43	9.7755	0.009	2.15	0.019
86	Pomona Alternative (PAS)	I	N/A	N/A	2.85	0.2	0.57	0.001	2.15	0.001
87	Pomona Senior High	I	N/A	N/A	2.85	19.88	56.658	0.051	2.15	0.109
88	Pomona Vocational	I	N/A	N/A	2.85	1.5	4.275	0.004	2.15	0.008
89	Pueblo Elementary	I	N/A	N/A	2.85	6	17.1	0.015	2.15	0.033
90	Ranch Hills Elementary	I	N/A	N/A	2.85	3.42	9.747	0.009	2.15	0.019

Site No.[1]	Site Name[2]	Use[8]	Potable Water Offset % [3]	Current Water Use (ac-ft/yr)	Irrigation Demand Factor	Future Irrigable Acres [4]	ADD (ac-ft/yr)	ADD (mgd)	MMD Peaking Factor	MMD (mgd)
91	Roosevelt Elementary	I	N/A	N/A	2.85	2.28	6.498	0.006	2.15	0.012
92	San Antonio Elementary	I	N/A	N/A	2.85	4.75	13.5375	0.012	2.15	0.026
93	San Jose Elementary	I	N/A	N/A	2.85	4.25	12.1125	0.011	2.15	0.023
94	Simons Middle	I	N/A	N/A	2.85	8.96	25.536	0.023	2.15	0.049
95	Vejar Elementary	I	N/A	N/A	2.85	4.55	12.9675	0.012	2.15	0.025
96	Village Academy (HS)	I	N/A	N/A	2.85	0.5	1.425	0.001	2.15	0.003
97	Washington Elementary	I	N/A	N/A	2.85	1.92	5.472	0.005	2.15	0.010
98	Westmont Elementary	I	N/A	N/A	2.85	2.07	5.8995	0.005	2.15	0.011
99	Yorba Elementary	I	N/A	N/A	2.85	3.97	11.3145	0.010	2.15	0.022
			Total			**241**	**687**	**0.61**		**1.32**
	Specific Plans									
100	Western University		Unknown							
101	Downtown Specific Plan		Unknown							

Notes:

(1) Site numbers correlate to the site number in Figure 6.

(2) Site numbers correlate to the site number in Figure 6.

(3) Applicable for industrial and commercial processes and is in addition to any irrigation needs

(4) Applicable for irrigation.

(5) Estimated based on aerial photography

(6) Estimated based on average irrigation patterns

(7) Estimated based on average industrial/commericial use patterns

(8) I = Irrigation, P = Industrial/Commercial Process, L = Waterscape for landscaping

Appendix D - Current Customer Demand in Year 2008
Recycled Water Master Plan
City of Pomona

Site No.[1]	Site Name[2]	Use[8]	Potable Water Offset % [3]	Current Water Use (ac-ft/yr)	Irrigation Demand Factor	Existing Irrigable Acres [4]	ADD (ac-ft/yr)	ADD (mgd)	MMD Peaking Factor	MMD (mgd)
	Existing Customers and Ext. Cust. With Additional Supply Needs									
1	City of Pomona- Park Booster	I	N/A	N/A	2.85	6	17.1	0.015	2.15	0.03
2	Bonelli Park	I	N/A	N/A	2.85	300	855	0.76	2.15	1.64
3	Cal Poly Pomona	I	N/A	N/A	2.85	435	1240	1.1	2.15	2.38
4	SR-57 South Campus. Dr.	I	N/A	N/A	2.85	9	26	0.023	2.15	0.049
5	SR-71 South Campus. Dr	I	N/A	N/A	2.85	18.0	51.3	0.046	2.15	0.098
			Total			**768**	**2189**	**2.0**		**4.20**
	Caltrans Ramps with Potential Irrigation Demands									
A	10 & Dudley	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
B	10 & Fairplex	I	N/A		2.85	4	11	0.010	2.15	0.02
C	10 & Garey	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
D	10 & Towne	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
E	10 & White	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
F	57 & Temple	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
1.G	60 & Phillips Ranch Rd.	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
H	60 & Reservoir Rd.	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
I	60 & Towne	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
J	71 & Garey	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
K	71 & Mission	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
L	71 & Rio Rancho Rd.	I	N/A	N/A	2.85	4	11	0.010	2.15	0.02
			Total			**48**	**137**	**0.1**		**0.3**
	Potential Customers									
6	San Dimas Canyon Golf Course	I	N/A	N/A	2.85	125[5]	356.25	0.32	2.15	0.68
	Cemeteries									
7	Forest Lawn Mortuary	I	N/A	N/A	2.85	90	256.5	0.23	2.15	0.49
8	Holy Cross Cemetery	I	N/A	N/A	2.85	8.5	24.225	0.022	2.15	0.046
9	Pomona Cemetery	I	N/A	N/A	2.85	35	99.75	0.09	2.15	0.19
			Total			**134**	**380**	**0.34**		**0.7**

Site No.[1]	Site Name[2]	Use[8]	Potable Water Offset % [3]	Current Water Use (ac-ft/yr)	Irrigation Demand Factor	Existing Irrigable Acres [4]	ADD (ac-ft/yr)	ADD (mgd)	MMD Peaking Factor	MMD (mgd)
	Homeowners Association									
10	Amcal Portofino Villas	I	N/A	N/A	2.85	3.7	10.545	0.009	2.15	0.020
11	Country Park Villas	I	N/A	N/A	2.85	1	2.85	0.0025	2.15	0.0055
12	Estates-Pomona Westland	I	N/A	N/A	2.85	< 0.5 acres	1.425	0.0013	2.15	0.0027
13	Hermosa Village	I	N/A	N/A	2.85	1	2.85	0.0025	2.15	0.0055
14	Hidden Valley	I	N/A	N/A	2.85	6[5]	17.1	0.015	2.15	0.03
15	Phillips Meadow	I	N/A	N/A	2.85	3	8.55	0.008	2.15	0.016
16	Phillips Ranch	I	N/A	N/A	2.85	18[5]	51.3	0.046	2.15	0.10
16a	Phillips Ranch - Rio Rancho Rd	I	N/A	N/A	2.85	13.3	37.8	0.034	2.15	0.07
16b	Phillips Ranch - Phillips Ranch Rd	I	N/A	N/A	2.85	16.5	46.97	0.042	2.15	0.090
16c	Phillips Ranch - Village L. Rd (1-20)	I	N/A	N/A	2.85	7.0	20	0.018	2.15	0.04
16d	Phillips Ranch - Village L. Rd (30-70)	I	N/A	N/A	2.85	15.4	44	0.039	2.15	0.08
16e	Phillips Ranch - Village L. Rd (70-100)	I	N/A	N/A	2.85	13.3	38	0.034	2.15	0.073
16f	Phillips Ranch - Santa Clara & Trabuco Rd	I	N/A	N/A	2.85	8.8	25	0.022	2.15	0.048
17	Quail Creek Pomona	I, L	5%	70	2.85	7	23.45	0.021	2.15	0.045
18	Village Gate	I	N/A	N/A	2.85	0.5[5]	1.425	0.0013	2.15	0.0027
19	Woodbridge PMA	I	N/A	N/A	2.85	0.5[5]	1.425	0.0013	2.15	0.0027
			Total	**70**		**41**	**333**	**0.30**		**0.64**
	Industrial/Commercial									
20	Braun Linen Service	P	99.00%	159	N/A	N/A	157.41	0.14	1.6	0.22
21	Angelica Textile Serv	P	99.00%	Unknown	N/A	N/A				
22	Brown Grandstands Inc	P	97.00%	10	N/A	N/A	9.7	0.009	1.6	0.014
23	California Acrylic Industries	P	97.00%	32	N/A	N/A	31.04	0.028	1.6	0.044
24	Mt. San Antonio Gardens (Congregational Homes)	I	N/A	N/A	2.85	11.69	33.3165	0.030	2.15	0.064
25	Ecoplast Corp	P	98%	3	N/A	N/A	2.94	0.003	1.60	0.0042
26	Gemini Aluminum Corporation	P	97.00%	13	N/A	N/A	12.61	0.011	1.6	0.018
27	Hehr International	P	97.00%	10	N/A	N/A	9.7	0.0087	1.6	0.014

Site No.[1]	Site Name[2]	Use[8]	Potable Water Offset % [3]	Current Water Use (ac-ft/yr)	Irrigation Demand Factor	Existing Irrigable Acres [4]	ADD (ac-ft/yr)	ADD (mgd)	MMD Peaking Factor	MMD (mgd)
28	Lanterman Hospital	I, P	Unknown	N/A	2.85	25[5]	68.4	0.061	2.15	0.13
29	Pomona Fairplex	I, P	N/A	N/A	2.85	35	99.75	0.09	2.15	0.19
30	Pomona Valley Hospital MC	I	N/A	N/A	2.85	5	14.25	0.013	2.15	0.03
31	Recycled Wood Products	P	97.00%	27	N/A	N/A	26.19	0.023	1.6	0.037
32	Ripon Cogeneration	P	0.00%	0	N/A	N/A	0	0.00	1.6	0.00
33	Robertson's Ready Mix	I, P	97.00%	64	N/A	N/A	62.08	0.055	1.6	0.089
34	Structure Composites	P	97.00%	24	N/A	N/A	23.28	0.021	1.6	0.033
35	W.R. Meadows Inc.	P	97.00%	28	N/A	N/A	27.16	0.024	1.6	0.039
36	West Coast Recycling Services	P	97.00%	3	N/A	N/A	2.91	0.00	1.6	0.0042
			Total	**373**		**127**	**581**	**0.52**		**0.93**
	Parks									
37	Centennial Park	I	N/A	N/A	2.85	0.50	1.43	0.0013	2.15	0.0027
38	Cesar Chavez Park	I	N/A	N/A	2.85	1.00	2.85	0.0025	2.15	0.0055
39	Civic Center	I	N/A	N/A	2.85	9.00	25.65	0.023	2.15	0.049
40	Country Crossing Park	I	N/A	N/A	2.85	8.00	22.80	0.020	2.15	0.044
41	Ganesha Park	I	N/A	N/A	2.85	60.00	171.00	0.15	2.15	0.33
42	Garfield Park	I	N/A	N/A	2.85	3.00	8.55	0.008	2.15	0.016
43	Hamilton Park	I	N/A	N/A	2.85	0.67	1.91	0.0017	2.15	0.0037
44	John F. Kennedy Park	I	N/A	N/A	2.85	8.00	22.80	0.020	2.15	0.044
45	Kellogg Park	I	N/A	N/A	2.85	8.00	22.80	0.020	2.15	0.044
46	Kiwanis Park	I	N/A	N/A	2.85	5.00	14.25	0.013	2.15	0.027
47	Lincoln Park	I	N/A	N/A	2.85	3.00	8.55	0.008	2.15	0.016
48	Madison Park	I	N/A	N/A	2.85	4.00	11.40	0.010	2.15	0.022
49	Memorial Park	I	N/A	N/A	2.85	2.00	5.70	0.0051	2.15	0.011
50	Mlk Jr Memorial Park	I	N/A	N/A	2.85	5.00	14.25	0.013	2.15	0.027
51	Montvue Park	I	N/A	N/A	2.85	4.50	12.83	0.011	2.15	0.025
52	Palomares Park	I	N/A	N/A	2.85	17.50	49.88	0.044	2.15	0.10
53	Philadelphia Park	I	N/A	N/A	2.85	4.50	12.83	0.011	2.15	0.025
54	Phillips Ranch Park	I	N/A	N/A	2.85	5.00	14.25	0.013	2.15	0.027
55	Pomona Jaycee Park	I	N/A	N/A	2.85	6.50	18.53	0.017	2.15	0.036
56	Powers Park	I	N/A	N/A	2.85	0.74	2.11	0.0019	2.15	0.0040
57	Ralph Welch Park	I	N/A	N/A	2.85	10.00	28.50	0.025	2.15	0.055
58	Ted Greene Park	I	N/A	N/A	2.85	4.20	11.97	0.011	2.15	0.023

Site No.[1]	Site Name[2]	Use[8]	Potable Water Offset % [3]	Current Water Use (ac-ft/yr)	Irrigation Demand Factor	Existing Irrigable Acres [4]	ADD (ac-ft/yr)	ADD (mgd)	MMD Peaking Factor	MMD (mgd)
59	Veterans Park	I	N/A	N/A	2.85	11.00	0.00	0.0000	2.15	0.00
60	Washington Park	I	N/A	N/A	2.85	14.00	39.90	0.036	2.15	0.08
61	Westmont Park	I	N/A	N/A	2.85	6.00	17.10	0.015	2.15	0.033
62	Willie White Park	I	N/A	N/A	2.85	5.00	14.25	0.013	2.15	0.027
			Total			**206**	**556**	**0.50**		**1.1**
	Schools									
63	Alcott Elementary	I	N/A	N/A	2.85	4.25	12.1125	0.011	2.15	0.023
64	Allison Elementary	I	N/A	N/A	2.85	4.9	13.965	0.012	2.15	0.027
65	Arroyo Elementary	I	N/A	N/A	2.85	3.6	10.26	0.009	2.15	0.020
66	Cortez Elementary	I	N/A	N/A	2.85	2.5	7.125	0.006	2.15	0.014
67	Decker Elementary	I	N/A	N/A	2.85	5.5	15.675	0.014	2.15	0.030
68	Diamond Ranch Senior High	I	N/A	N/A	2.85	42	119.7	0.107	2.15	0.230
69	Emerson Middle	I	N/A	N/A	2.85	7.65	21.8025	0.019	2.15	0.042
70	Fremont Middle	I	N/A	N/A	2.85	12.72	36.252	0.032	2.15	0.070
71	Ganesha Senior High	I	N/A	N/A	2.85	11.12	31.692	0.028	2.15	0.061
72	Garey Senior High	I	N/A	N/A	2.85	19.58	55.803	0.050	2.15	0.107
73	Garey Village (HS)	I	N/A	N/A	2.85	5	14.25	0.013	2.15	0.027
74	Harrison Elementary	I	N/A	N/A	2.85	4.6	13.11	0.012	2.15	0.025
75	John Marshall Middle	I	N/A	N/A	2.85	8.69	24.7665	0.022	2.15	0.047
76	Kingsley Elementary	I	N/A	N/A	2.85	5.58	15.903	0.014	2.15	0.030
77	Lexington Elementary	I	N/A	N/A	2.85	3.74	10.659	0.010	2.15	0.020
78	Lincoln Elementary	I	N/A	N/A	2.85	2.57	7.3245	0.007	2.15	0.014
79	Lopez Elementary	I	N/A	N/A	2.85	2.5	7.125	0.006	2.15	0.014
80	Madison Elementary	I	N/A	N/A	2.85	2.83	8.0655	0.007	2.15	0.015
81	Mendoza Elementary	I	N/A	N/A	2.85	1.8	5.13	0.005	2.15	0.010
82	Montvue Elementary	I	N/A	N/A	2.85	2.85	8.1225	0.007	2.15	0.016
83	Palomares Middle	I	N/A	N/A	2.85	18.23	51.9555	0.046	2.15	0.100
84	Park West High	I	N/A	N/A	2.85	1	2.85	0.003	2.15	0.005
85	Philadelphia Elementary	I	N/A	N/A	2.85	3.43	9.7755	0.009	2.15	0.019
86	Pomona Alternative (PAS)	I	N/A	N/A	2.85	0.2	0.57	0.001	2.15	0.001
87	Pomona Senior High	I	N/A	N/A	2.85	19.88	56.658	0.051	2.15	0.109
88	Pomona Vocational	I	N/A	N/A	2.85	1.5	4.275	0.004	2.15	0.008
89	Pueblo Elementary	I	N/A	N/A	2.85	6	17.1	0.015	2.15	0.033

Site No.[1]	Site Name[2]	Use[8]	Potable Water Offset % [3]	Current Water Use (ac-ft/yr)	Irrigation Demand Factor	Existing Irrigable Acres [4]	ADD (ac-ft/yr)	ADD (mgd)	MMD Peaking Factor	MMD (mgd)
90	Ranch Hills Elementary	I	N/A	N/A	2.85	3.42	9.747	0.009	2.15	0.019
91	Roosevelt Elementary	I	N/A	N/A	2.85	2.28	6.498	0.006	2.15	0.012
92	San Antonio Elementary	I	N/A	N/A	2.85	4.75	13.5375	0.012	2.15	0.026
93	San Jose Elementary	I	N/A	N/A	2.85	4.25	12.1125	0.011	2.15	0.023
94	Simons Middle	I	N/A	N/A	2.85	8.96	25.536	0.023	2.15	0.049
95	Vejar Elementary	I	N/A	N/A	2.85	4.55	12.9675	0.012	2.15	0.025
96	Village Academy (HS)	I	N/A	N/A	2.85	0.5	1.425	0.001	2.15	0.003
97	Washington Elementary	I	N/A	N/A	2.85	1.92	5.472	0.005	2.15	0.010
98	Westmont Elementary	I	N/A	N/A	2.85	2.07	5.8995	0.005	2.15	0.011
99	Yorba Elementary	I	N/A	N/A	2.85	3.97	11.3145	0.010	2.15	0.022
			Total			**241**	**687**	**0.61**		**1.3**
	Specific Plans									
100	Western University									
101	Downtown Specific Plan									

Notes:

(1) Site numbers correlate to the site number in Figure 6.

4862

(2) Site numbers correlate to the site number in Figure 6.

(3) Applicable for industrial and commercial processes and is in addition to any irrigation needs

(4) Applicable for irrigation.

(5) Estimated based on aerial photography

(6) Estimated based on average irrigation patterns

(7) Estimated based on average industrial/commericial use patterns

(8) I = Irrigation, P = Industrial/Commercial Process, L = Waterscape for landscaping

Appendix E

PROJECT CORRESPONDENCE

This Appendix includes project correspondence with the SDLAC and IEUA.

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MEETING NOTES

Project:	City of Pomona - Recycled Water Master Plan	**Conf. Date:**	October 14, 2008
Client:	City of Pomona	**Issue Date:**	October 28, 2008
Location:	148 N. Huntington Street, Pomona, CA		
Attendees:	City of Pomona: Nichole Horton (NH) Carollo: Inge Wiersema (IW) LACSD: Earle Hartling (EH)		
Purpose:	Discuss existing and future recycled water supplies from LACSD to the City.		
Distribution:	Attendees, Mark Bartlett	**File:**	8023A.00

Discussion:
The following is our understanding of the subject matter covered in this conference. If this differs with your understanding, please notify us.

- The City of Pomona (City) has the contractual right to two thirds (67%) of the effluent flow from the Pomona Water Reclamation Plant (WRP), while one third (33%) is allocated to the gravity system owned and operated by the Los Angeles County Sanitation Districts (LACSD).
- The arrangement of the three chlorine contact tanks at the Pomona WRP allow for unused recycled water from either system flow to the other. Such redistribution is dependent upon the demand.
- Any excess flow beyond the combined demand is discharged into the river. This primarily occurs during the winter when recycled water demands are low. There are no ammonium breakthrough problems in the winter.
- The current capacity of the Pomona WRP is 9.0 to 9.5 mgd. However, in the past, flows up to 11.0-11.5 mgd have been handled by the facility. High peaking factors were acceptable in the past. However, now, the plant experiences nitrification and ammonia breakthrough at high flows.
- The construction of equalization basins could increase the plant capacity back to 11.0-11.5 mgd. The use of equalization basins also improves the overall process performance.
- LACSD is seriously looking at the construction of equalization basins. The facility has enough space for more storage. It is anticipated that this storage will be constructed by 2012. It can therefore be assumed that the flow of the Pomona WRP in the planning year 2015 and beyond will increase from 9.5 mgd to 11.5 mgd, and potentially 13.0 mgd.
- There are a number of benefits of constructing this reservoir for LACSD. These are:
    - There is a solid customer base in Pomona, allowing the LACSD to sell its water.
    - Selling recycled water avoids loss of this water to the river, which gets counted against the annual quantity limit for groundwater recharge. Instead, when the flow is diverted, San Jose Creek WRP can sell the water or recharge it to generate more revenue.
    - Selling water avoids discharge into the river, which currently can cause NPDES

permit compliance issues in the summer due to high ammonia levels.
    - Producing more recycled water upstream helps reduce flows that would otherwise need to be treated at the Joint Water Pollution Control Plant (JWPCP) in Carson and discharged into the ocean through one of the two 90-year old tunnels through the Palos Verdes peninsula that are already operating at capacity. The preliminary design of a third tunnel is currently ongoing, however, this is a complicated and very expensive project ($1 billion) that will take a lot of effort and time to implement.
    - Although a third tunnel seems inevitable, there are also thoughts about using the $1 billion to realize many upstream projects and go to a zero flow scenario. Groundwater recharge in the West Coast and Central groundwater basins, the Alamitos Seawater Intrusion Barrier, and or the Main San Gabriel Basin are part of this approach.
    - Another option would be to divert some of the flow from LACSD's JWPCP in Carson through additional treatment to augment the West Basin MWD's recycled water distribution system.
- The Pomona WRP is a scalping plant, which means that some of the tributary flow can bypass the plant and be diverted to the JWPCP.
- LACSD is planning to construct a new 2-3 MG storage reservoir along the gravity recycled water pipeline near Spadra Landfill.
- The current problem with the gravity pipeline is the structural integrity. LACSD has replaced many portions, however, some portions are in very narrow easements and are difficult to access. The pipeline has the potential of collapsing, especially since water is being backed up into and pumped out of the old pipe, while it was built for gravity flow.
- LACSD uses a "shared savings rate" to calculate its price for recycled water.
    - The shared savings refers to the difference between 90 percent of the cost of an alternative supply and the purchasers recycled water distribution system (melted Capital + O&M) cost.
    - The minimum rate would be at 30% of the District's melded cost of producing recycled water (all of LACSD's WRPs in the Los Angeles Basin are included), currently $82 per acre-foot.
    - For example: If imported water is $475/acre-ft and the City's cost of operating its recycled water distribution system is $225/acre-ft. Thus, the difference between 90% of imported water ($425/acre-foot) and the City's cost of $225/acre-ft is $200/acre-foot. The shared savings means that LACSD will charge $100/acre-foot for the recycled water commodity, while the City will save $100/acre-foot, when using a rate of $325/acre-foot.
    - The City currently pays approximately $109/acre-foot (40% O&M until 2009, then 30%)to LACSD for recycled water.

Prepared By:

Inge Wiersema, P.E.

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MEETING NOTES

Project:	City of Pomona - Recycled Water Master Plan	**Conf. Date:**	October 16, 2008
Client:	City of Pomona	**Issue Date:**	October 28, 2008
Location:	148 N. Huntington Street, Pomona, CA		

Attendees:

City of Pomona:	Carollo:	IEUA
Nichole Horton (NH)	Inge Wiersema (IW)	Rich Atwater (RA)
Raul Garibay (RG)		Tom Love (TL)
		Mike Hoover (MH)
		Tom Holliman (TH) ?
		Ray

Purpose: Discuss potential recycled water supplies from IEUA to the City.

Distribution: Attendees, Mark Bartlett **File:** 8023A.00

Discussion:

The following is our understanding of the subject matter covered in this conference. If this differs with your understanding, please notify us.

- IW asked about the status of the San Antonio Channel Pipeline. TL explained that the construction of this pipeline has been completed and is in service. He also stated that:
    - The pipeline ends on Orchard Street on the east side of the San Antonio Channel.
    - The pipeline is fully pressurized and water is not discharged into the channel by gravity as initially planned.
    - The pressure at the far west end of the pipeline ranges from 60-80 psi.
- TH explained that a recent feasibility study looked at the available capacity in this pipeline. This study concluded that:
    - There is no longer any peak capacity available in a few years from now.
    - There will be 2 options for off-peak deliveries:
        1. Delivery on-demand, which will require on-site storage.
        2. Delivery during the low demand season (December through April) and/or low demand hours (9 am through 6 pm)
- The City of Pomona would have to provide some storage.
- RB confirmed that the City has a site for a storage reservoir and on-site pumping station.
- IW asked what the potential supply availability would be in the short-term and long-term, as the expansion of recycled water usage by IEUA's member agency's will reduce the amount of available recycled water over time. TL explained that this question is difficult to answer due to the large number of unknowns at this time from the available supplies to recycled water demands. IEUA has met the 3-year business plan goal of 50,000 acre-ft/yr.
- TL said that as a rough guess, IEUA could potentially deliver 1500-2000 acre-ft/year on a long-term basis. The City of Pomona would need to build a reservoir to stabilize the flow. However, IEUA would need to do some analysis to confirm this amount and

determine the seasonal distribution of this supply (by month) for the near-term and long-term.

- IW will use this information to size the storage facility required by the City of Pomona to buffer daily fluctuations in demand. Seasonal storage will not be considered, as this is too costly.
- TL also elaborated on the water quality of IEUA's recycled water as all plants include denitrification (in contrary to most LA plants.
- Jar testing has indicated that water leaving the plant at 5 mg/L will remain a residual of appr. 3.5 mg/L after 3 days.
- Due to the long travel time from RP-1 to the end of the San Antonio Channel Pipeline and the Pomona service area, it may be desired to add a chlorine injection station within the IEUA service area.
- The City of Pomona will continue to plan its system such that potable make-up water can be used to supplement the system if necessary. This is currently used appr. 10 days/yr.
- RG also stated that Carollo Engineers need to include to possibility to spread water at the Pedley WTP in the recycled water supply evaluation. The Pedley Plant is located near 17th Street and Benson Street and has 8-10 acres of existing surface spreading grounds. There is a lot more space for expansion. RG estimated that only 20-30 percent of the site is used. The City could potentially use water from Three Valleys MWD to blend.

Next Meeting

- The next meeting is scheduled on 10-30-2008 at 2:30 PM at the IEUA Headquarters.

Prepared By:

Inge Wiersema, P.E.

Action Items

Item	Description	Action Item Date	Who	Due Date
1	Determine the seasonal distribution (by month) of recycled water that would be available for the City of Pomona in the near-term (3-years) and long-term (build-out).	10/16/08	IEUA	10/30/08
2	Determine the potential recycled water supply needs in the east part of the City.	10/16/08	Inge	10/8/08

Decision Items

No.	Description of Decision	Date

Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

6075 Kimball Ave, • Chino, CA 91708
P.O. Box 9020 • Chino, Hills, CA 91709
TEL (909) 993-1600 • FAX (909) 597-8875
www.ieua.org

July 10, 2009

James Taylor
City of Pomona
148 N. Huntington St.
Pomona, CA 91768

Subject: IEUA Recycled Water Service to City of Pomona

Dear: Mr. Taylor

IEUA and the City of Pomona have collaborated on the preparation of a Recycled Water Master Plan which identified the potential delivery of recycled water from IEUA's Regional Water Recycling System to the City of Pomona. IEUA's available recycled water supply is dependent on the current wastewater flows and projected increases in wastewater flows as development occurs.

Since the preparation of the Recycled Water Master Plan two significant assumptions affecting projected wastewater flows have changed: 1) Growth has slowed dramatically which has reduced the projected wastewater flows over the next several years; 2) The wastewater flow factors per EDU are significantly lower than the assumptions used historically in IEUA's Wastewater Master Plan. The economic slowdown affecting growth may improve in the next several years and long term build-out growth projections remain unchanged. However, the lower wastewater flows per unit for new development are not expected to increase and may decrease due to enhanced indoor water conservation efforts.

The projected recycled water demand within IEUA's service area is expected to exceed 90% of the recycled water supply within the next few years and all of the supply will be utilized during the peak summer months primarily to meet the direct reuse demands (no groundwater recharge during peak summer deliveries). Based on these supply and demand projections IEUA is not in a position at this time to commit to a firm long term recycled water supply outside the service area.

IEUA continues to evaluate opportunities to maximize recycled water use in the Chino Basin and will keep the City informed if these circumstances change. If you have any questions or need additional information please let me know.

Sincerely

Thomas A. Love, P.E.

Executive Manager - Engineering

Terry Catlin, President; Angel Santiago, Vice President; Michael E. Camacho, Secretary/Treasurer; Gene Koopman, Director; John L. Anderson, Director; Richard W. Atwater, Chief Executive Officer/General Manager

Appendix F

REGULATORY DOCUMENTS

This Appendix includes the following documents:

- Los Angeles RWQCB, Tentative Reuse Order
- Supplementary Engineering Report submitted to the CDPH for connecting Robertson's Ready Mix.
- RWQCB approval letter for Robertson's Ready Mix connection
- Preliminary Mandatory Use Ordinance for Recycled Water

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State of California
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD LOS ANGELES REGION

GENERAL WATER REUSE ORDER NO. R4-2009-XXX

GENERAL WASTE DISCHARGE AND WATER RECYCLING REQUIREMENTS FOR TITLE 22 RECYCLED WATER

FOR USE OVER THE GROUNDWATER BASINS UNDERLYING THE COASTAL WATERSHEDS OF LOS ANGELES AND VENTURA COUNTIES

(File No. 08-155)

TENTATIVE

The California Regional Water Quality Control Board, Los Angeles Region, (Regional Board), finds:

PURPOSE AND APPLICABILITY

1. The Regional Board has declared its intent to promote the use of disinfected recycled water[1,2] (recycled water). Recycled water is a coagulated[1] and filtered[1] wastewater, which is reused as a valuable resource and significant component of California's water supply.

2. This Order serves as a General Water Reuse Order (General Order) authorizing municipal wastewater reuse by Producers[1], Distributors[1] and Users[1] of non-potable recycled wastewater throughout the Los Angeles Region (Region).

3. For this General Order, "recycled water" is limited to recycled water produced by a public entity at a municipal wastewater treatment plant, as defined in CWC section 13625(b)(1) and section 13625(b)(2). This General Order is not applicable for the use of water produced from the treatment of other wastewaters (e.g., oil field production, food processing, storm water, etc.) at other types of treatment facilities (e.g., industrial wastewater treatment plants).

4. The intent of this Order is:

   A. To streamline the permitting process and delegate the responsibility of administrating water reuse programs to local agencies to the fullest extent possible.

[1] See Attachment A for definition.
[2] The terms "recycled water" and "reclaimed water" have the same meaning (CWC section 26).

B. To serve as a region-wide general permit for publicly owned wastewater and water agencies[1] that recycle treated municipal wastewater, and to apply to the following suppliers of recycled water:

a. Producers of disinfected secondary[1]- and tertiary[1]-treated recycled water that meets California Code of Regulations (CCR) Title 22 water recycling criteria[1] (Attachment B) and is reused for a direct beneficial use or a controlled use that would not otherwise occur.

b. Distributors of recycled water - who receive treated wastewater from a municipal wastewater facility, whether or not they provide additional treatment to meet CCR Title 22 water recycling criteria for its intended use(s) and who distribute it to Users. In some cases, a written agreement (e.g., Joint Powers Agreement or equivalent contractual agreement) between a Producer and a Distributor may be preferable to enrolling the Distributor under this Order.

5. Water reuse is an essential part of an overall program to manage local and regional water resources. Many local governing bodies have adopted resolutions establishing their intent to proceed with the planning, permitting, and implementation of water reuse projects. In addition, Section 13510 of the California Water Code states that:

> "It is hereby declared that the people of the state have a primary interest in the development of facilities to recycle water containing waste to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the state."

6. Further, Section 13550 of the California Code states that:

> "The Legislature hereby finds and declares that the use of potable domestic water for nonpotable uses, including, but not limited to, cemeteries, golf courses, parks, highway, landscaped areas, and industrial and irrigation uses, is a waste or an unreasonable use of the water within the meaning of Section 2 of Article X of the California Constitution if recycled water is available which meets all of the following conditions, as determined by the state board..."

REUSE FACILITIES AND THEIR RESPONSIBILITIES

7. Most of the publicly owned wastewater treatment works (POTWs) in the Region, hereinafter referred to as the Producers, produce treated wastewater of sufficient quality to allow its reuse for certain applications as prescribed in this Order. Water service agencies also have authority under the provisions set forth in this Order to

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distribute recycled water within their respective jurisdictions. The Producers are now covered under individual water recycling requirements primarily for irrigation uses. However, they have expressed an interest in expanding recycled water for other uses not covered by their current water recycling requirements, such as dust control or street sweeping.

8. POTWs provide recycled water that receives at least secondary level treatment with appropriate disinfection to Distributors or Users under written agreements with the participating Producers/Distributors respectively. The recycled water meets the quality criteria established by California Department of Public Health[1] (CDPH) and this Order. Additional treatment by the Producer or Distributor may be necessary to meet the intended use. The Producers or Distributors are responsible for insuring that water reuse is adequately monitored through an approved program (See Attachment C).

9. Decisions regarding any changes of treatment and distribution facility construction, operation, funding, cost-sharing and related aspects are the responsibility of the Producers, Distributors and affected Users. The decisions shall be submitted at least 120 days prior to any changes to the CDPH and the Regional Board for approval.

STATE RECLAMATION PLANS, POLICIES AND REGULATIONS

10. In July 1992 Section 13523.1 was added to the California Water Code, authorizing regional boards to issue master reclamation permits[3] to a Producer and/or Distributor of recycled water in lieu of prescribing individual water reuse requirements for a User of recycled water. Section 13523.1 also removes the requirement, except upon written request of a regional board, that Users file a report with a regional board to use recycled water from a producer/distributor for whom a master reuse Order has been issued. Similarly, it exempts any such User of recycled water from the requirement to file a report with a regional board related to any material change in the character of the recycled water or its use.

11. The State Board adopted Resolution No. 77-1, Policy with Respect to Water Reclamation in California, which includes principles that encourage and recommend funding for water recycling and its use in water-short areas of the State. On September 26, 1988, the Regional Board also adopted Resolution No. 88-012, Supporting Beneficial Use of Available Reclaimed Water in Lieu of Potable Water for the Same Purpose, which encourages the beneficial use of recycled wastewater and supports water recycling projects.

[3] A benefit of master reclamation permits is that individual recycled water users are not required to seek individual coverage permits from a regional board, thereby avoiding additional regulatory burdens and costs. Producers and/or Distributors that operate pursuant to a master reclamation permit shall be allowed to retain coverage under the master reclamation permit.

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12. A February 24, 2004 State Board memorandum from Celeste Cantú to the Regional Board Executive Officers entitled "Incidental Runoff[1] of Recycled Water", provided recommendations regarding regulatory management of incidental runoff. The memorandum stated: To further the goal of maximizing the use of recycled water, the water quality laws should be interpreted in a manner that is consistent with the intent of the Legislature to promote recycled water use. Consequently, incidental runoff from recycled water projects shall be handled as follows:

    A. Where reclamation requirements prohibit the discharge of waste to waters of the State and discharges are not expected to occur, occasional runoff should not trigger the need for either an individual NPDES permit or enforcement action.

    B. If discharges from reclamation project area occur routinely, such discharges can be regulated under municipal storm water NPDES permit in most cases.

    C. In limited cases, where necessary to address a water quality concern, discharges of recycled water to surface waters may be regulated under an individual NPDES permit. An NPDES permit, however, should not be issued unless necessary to achieve water quality objectives.

    The memorandum also describes the framework for regulating incidental runoff from irrigation systems and from storage ponds without issuing such an NPDES permit.

STATE HEALTH REGULATIONS

13. Section 13523 of the California Water Code provides that a Regional Board, after consulting with and receiving recommendations from CDPH or its delegated local health agency, and after any necessary hearing, shall, if it determines such action to be necessary to protect the health, safety, or welfare of the public, prescribe water recycling requirements for water that is used or proposed to be used as recycled water. Section 13523 further provides **at a minimum** that the recycling requirements shall include, or be in conformance with, the statewide water recycling criteria established by CDPH pursuant to Water Code section 13521.

14. Pursuant to California Water Code section 13523, the Regional Board has consulted with the CDPH regarding this General Order and the types of proposed recycling projects to be covered by this General Order. The Regional Board has incorporated CDPH's recommendations in this Order.

15. The requirements contained in this Order are in conformance with the goals and objectives of the Basin Plan and implement the requirements of the California Water Code and Title 22 California Code of Regulations, Chapter 3 Water Recycling Criteria.

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16. The information required by this General Order is necessary to determine compliance with this General Order and to ensure compliance with the CWC and the Title 22 Requirements. Improper use or discharge of recycled water represents a threat to the quality of waters of the state and to human health and the environment. A completed Notice of Intent[4] (NOI) form (Attachment D) identifies the entities responsible for ensuring proper production, distribution, and/or use of recycled water in accordance with this General Order.

17. A 1996 Memorandum of Agreement (MOA) between the CDPH and State Water Resources Control Board (State Board) on behalf of itself and the Regional Boards regarding the use of recycled water allocates primary areas of responsibility and authority between these agencies. The MOA provides methods and mechanisms necessary to ensure ongoing and continuous future coordination of activities relative to the use of recycled water in California. This General Order includes requirements consistent with the MOA.

WATER QUALITY CONTROL PLAN FOR THE LOS ANGELES REGION

18. The Board adopted a revised Water Quality Control Plan for the Los Angeles Region (Basin Plan) on June 13. 1994 prescribing water quality objectives for ground and surface waters throughout the Region. The State Board approved it on November 17, 1994, with approval from the State Office of Administrative Law on February 23, 1995.

    Protection of Beneficial Uses
    The Basin Plan identifies existing and potential beneficial uses of the Region's underlying groundwaters as:

    A. Municipal and domestic supply;

    B. Industrial Service and Process Supply; and,

    C. Agricultural Supply.

SPECIFIED USES OF RECYCLED WATER

19. The Regional Board finds that the following uses of recycled water present a low risk to the beneficial uses of ground water when they meet Title 22 requirements and are applied in a manner where runoff to surface waters or saturation of underlying soils does not occur. In addition, the following uses are generally short-term:

[4] All responsible entities (Producer, Distributor, and User), as determined by those involved in the project, shall have a duly authorized representative sign the Notice of Intent form for the Use Area. See Attachment D for Notice of Intent form.

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A. Industrial boiler feed;

B. Nonstructural fire fighting;

C. Backfill consolidation around nonpotable piping;

D. Soil compaction; Mixing concrete;

E. Dust control on roads and streets;

F. Cleaning roads, sidewalks, and outdoor work areas; and,

G. Industrial process water that will not come into contact with workers.

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CEQA AND PUBLIC NOTICE

20. The proposed uses of recycled water will maintain and enhance natural resources and preserve potable sources of water, and thus this Order is categorically exempt from the provisions of the California Environmental Quality Act in accordance with Title 14, California Administrative Code, Chapter 3, Section 15307.

21. The Board has notified the Producers, Distributors and interested agencies and persons of its intent to prescribe water reuse requirements and has provided them the opportunity for a public hearing and to submit their written views and recommendations.

22. The Regional Board, in a public meeting, heard and considered all comments pertaining to this General Order.

IT IS HEREBY ORDERED, that all responsible entities (Producers, Distributors, and Users) shall submit a Notice of Intent for the Use Area, or a separate report of waste discharge. Entities that file a Notice of Intent indicating their intention to be regulated under the provisions of this general order and receive program authorization from this Board shall comply with the following:

A. **PROHIBITIONS**

1. The treatment, storage, distribution, or reuse of recycled water shall not create a nuisance as defined in Section 13050(m) of the California Water Code.

2. No recycled water shall be applied to Use Site Area[1] (Site or Use Area) during periods when soils are saturated.

3. Recycled water shall not be allowed to escape from the designated use area(s) as surface flow that would either pond and/or enter waters of the state.

Secondary-treated recycled water as described under Section B shall not be allowed to escape from the designated use area(s) as an airborne spray that would visibly wet vegetation or any other surface.

4. Spray or runoff shall not enter a dwelling or food handling facility, and shall not contact any drinking water fountain, unless specifically protected with a shielding device, such as a piece of plastic cover.

5. Recycled water shall not be applied in groundwater recharge and wellhead protection areas.

6. The use of recycled water shall not cause or contribute to rising groundwater to impair surface water quality objectives or beneficial uses.

7. Recycled water shall not be used as a domestic or animal water supply.

8. There shall be no cross-connection between potable water supply and piping containing recycled water. All Producers, Distributors, and Users of recycled water shall provide for appropriate backflow protection for potable water supplies as specified in Title 17, Section 7604 of the California Code of Regulations or as specified by CDPH.

9. The discharge of recycled water by any Producer, Distributor, or User pursuant to this General Order is prohibited unless interested entities have submitted a complete NOI, Operation & Maintenance Plan (see Section D.9), and application fee.

10. The use of recycled water in a manner different than described in the Operation & Maintenance Plan is prohibited.

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B. RECYCLED/REUSE WATER QUALITY REQUIREMENTS AND LIMITATIONS

1. Reuse Water Quality Requirements and Limitations of this Order shall meet the most current CCR Title 22 regulations.

2. The Producers/Distributors shall discontinue delivery of recycled water for intended reuse projects during any period in which it has reason to believe that the limits for that use as specified below or the requirements of the CDPH reuse criteria insofar as they relate to the quality of the recycled water, are not being met. The delivery of recycled water shall not be resumed until all conditions which caused the violations have been corrected.

3. Minimum Recycled Water Quality- Secondary - 23 Recycled Water (Restricted Use)

Water to be recycled for reuse shall at a minimum be adequately oxidized and disinfected water that receives at least secondary level treatment and meets, at a minimum, the following limits:

a. Dissolved Oxygen 1.0 mg/l minimum

b. Dissolved Sulfide 0.1 mg/l maximum

c. Total Coliform: All water recycled for reuse authorized under this permit must meet the total coliform limits specified below (at either the Producer's wastewater treatment plant or, if necessary, after additional treatment at a Distributor's plant) prior to delivery for reuse purposes.

   After adequate contact with disinfectant the number of total coliform organisms shall not exceed:

   i. A median value of 23 MPN/100ml as determined from the bacteriological results of the last seven days for which sample analyses have been completed; and,

   ii. A maximum value of 240 MPN/100ml in more than one sample in any 30 day period.

d. Reuse Applications:

   At a minimum, secondary-23 recycled water may be used where the public has restricted access or exposure for the following reuse applications:

   i. Industrial boiler feed;

   ii. Nonstructural fire fighting;

   iii. Backfill consolidation around nonpotable piping;

   iv. Soil compaction; Mixing concrete;

   v. Dust control on roads and streets;

   vi. Cleaning roads, sidewalks, and outdoor work areas;

   vii. Industrial process water that will not come into contact with workers; and,

   viii. Flushing sanitary sewers.

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4. Recycled Water Storage Limitations

   a. Any storage facility containing recycled water for reuse applications shall be managed in a manner to control odor or nuisance conditions. Should such problems develop, a management plan shall be devised and implemented to monitor, correct, and control future occurrences.

   b All wastewater storage ponds shall be adequately protected from erosion, washout and flooding from a 24-hour rainfall event having a predicted frequency of once in 100 years.

   c. The storage of recycled water within 100-feet of a domestic well, unless approved by the CDPH, is prohibited.

C. **REUSE PROGRAM PROVISIONS**

1. **Producer Responsibilities**

   a. The Producers intending to be covered under this General Water Reuse Order shall submit a NOI.

      Producer responsibilities in this section may be required of or undertaken by the Distributor as determined between them. In such case the Distributor shall submit the NOI or the Producer shall show evidence of an agreement with the Distributor to undertake the responsibilities. In any case respective responsibilities shall be spelled out in the joint agreement, which must be submitted with the NOI.

   b. This Order becomes effective upon written approval of the NOI by the Executive Officer.

   c. The Producers shall develop administrative procedures specifying how the permit based system, based upon General Water Reuse Order No. R4-2009-XXXX, for regulating Distributors and/or Users will be implemented and how compliance with the CDPH reuse criteria will be ensured. The Producers may authorize specific reuse projects on a case-by-case basis once the administrative procedures of the water reuse program are established.

   d. The Producers or Distributors (as appropriate) shall submit to CDPH for review and approval documentation of the proper installation of Title 22 mandated backflow prevention devices and the absence of cross connections prior to commencing use of recycled water at Sites[1] (Attachment E) meeting any of the following criteria:

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i. Where the proposed use is a new use that is not covered in the CDPH reuse criteria.

ii. Dual plumbed systems[1] (per Title 22 definition - within building plumbing and residential irrigation).

iii. Large, high volume usage, or otherwise complex Sites as defined in the Producer's Water Reuse Program (pursuant to Provision D.3.).

The Producers or Distributors (as appropriate) shall also submit a copy of the CDPH's approval to the Regional Board within 30 days upon receiving of the CDPH's approval.

f. The Producers will be responsible for ensuring that recycled water meets the quality standards of this Order and for the operation and maintenance of major transport facilities and associated appurtenances. The Producers shall hold the Distributors and/or Users responsible for the application and use of recycled water on their designated Use Areas and associated operations and maintenance in accordance with all applicable Title 22 reuse criteria requirements.

g. The Producers shall conduct periodic inspections of the Users' facilities and operations to monitor and ensure compliance with conditions of the Producers' permits and this Order. The Producers shall take whatever actions are necessary, including the termination of delivery of recycled water to the Users, to correct any violations.

h. The Producers shall comply with all applicable items of the attached Standard Provisions and Reporting Requirements, or any amendments thereafter.

i. When additional Site specific requirements and/or Provisions are applied to a reuse project as a condition of adoption of this Order, they shall be identified in the NOI.

2. **Joint Responsibilities**

a. Each Distributor and/or User shall demonstrate to the Producers the means by which all applicable use area requirements, as specified in CDPH reuse criteria, will be complied with. Each User shall comply with the applicable uniform region-wide recycling criteria established pursuant to CWC section 13521 (Title 22 section 60301 et. seq.,).

b. If someone other than the User (User's Agent) is responsible for applying the recycled water, e.g. a truck hauler, then the User shall require them of

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these requirements in a written permit or other suitable manner. A User's Agent shall fill out a Recycled Water Release Form or equivalent tracking documentation when receiving recycled water from the Producer.

c. A copy of the General Order must be provided to the Distributor(s) and/or Users by the Producer. The Distributor(s) and/or Users must have these available at all times for inspection by Regional Board staff, the Producer, or State/County Health Officers.

d. The Producers shall comply with the self-monitoring program as adopted by the Board and as may be amended by the Executive Officer. The Producers are responsible for all necessary information from Distributors and/or Users. Distributor(s) and/or Users are responsible for submitting on-site observation reports and use data to each Producer, who will compile and file an annual report with the Regional Board. The Producer, at its discretion, may assume the Distributor(s)' and/or Users' responsibility for on-site observation reports and use data.

e. The Producers shall ensure that cross-connections between potable water and nonpotable water systems have not been created and that backflow prevention devices are in proper working order by conducting or requiring User testing, in accordance with CDPH reuse criteria and CCR Title 22 Section 7605. Reports of testing and maintenance shall be maintained by the Producers.

f. The Producers, Distributors (if any), and Users shall maintain in good working order and operate any facility or control system installed by the Producers, Distributors (if any), and Users, respectively, to achieve compliance with the water reuse requirements.

g. The Producers, Distributors (if any), and Users shall receive appropriate employee training to ensure proper operation of recycling facilities, and compliance with this Order. In accordance with CCR Title 17, Section 7586, each Producer, Distributor (if any), and User shall designate a Recycled Water Supervisor[1] responsible for compliance with a Producer's permit conditions.

h. The Producers, Distributors (if any), and Users shall ensure that all above ground equipment, including pumps, piping, storage reservoir, and valves, etc. which may at any time contain recycled water shall be adequately and clearly identified with appropriate warning signs. The Producers, Distributors (if any), and Users shall inform the public that the liquid being distributed is recycled water and is unfit for human consumption.

T E N T A T I V E

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i. When street sweeping (including road, sidewalk, and outdoor work area cleansing) uses both recycled water and potable water, the Producers, Distributors (if any), and Users shall ensure cross-connection protection by complying with the following:

   i. Each vehicle shall have two risers, one for potable and one for recycled water. An air gap separation between the riser outlet and water tank shall be provided;

   ii. The risers, hoses and fittings for each supply shall be color coded (painted), blue for potable and purple for recycled water;

   iii. The hoses, hydrants and risers for each supply shall have separate and unique fittings (e.g., 2-1/2 inch diameter on the potable system and 2 inch diameter on the recycled water system) such that the potable system cannot accidentally be used on the recycled system and vice versa;

   iv. Signage shall be placed on each vehicle identifying it as carrying nonpotable /recycled water and incorporate the wording "**RECYCLED WATER – DO NOT DRINK**" and the international symbol as shown in Page B-10 of Attachment B; and,

   v. Vehicle used for street sweeping shall be restricted for delivering potable water for human consumption.

j. Each Producer and/or Distributor shall have an Operation and Maintenance Plan (O&M Plan) in place, which contains the following elements:

   j. A detailed operations plan for the Use Area including methods and procedures for implementation of regulations regarding recycled water use and maintenance of equipment and emergency backup systems to maintain compliance with the conditions of this General Order and CDPH requirements (i.e., identification of Best Management Practices implemented to achieve and maintain compliance);

   ii. A copy of the approved Title 22 Engineering Report[1] submitted to CDPH and any recommendations or "conditions of approval" provided by the CDPH;

   iii. A copy of the Producer's established rules and/or regulations, as approved by the CDPH, for Distributors and Users governing the design and construction of recycled water use facilities and the use

of recycled water in accordance with the criteria established in Title 22 and this Order;

iv. A copy of the written (and signed) agreement between the respective parties responsible for the producing, distributing, and using the recycled water;

v. A copy of the duty statement for the recycled water use supervisor responsible for the Use Area; and,

vi. Verification that the recycled water use supervisor has attended training regarding the safe and efficient operation and maintenance of recycled water use facilities.

k. To comply with this General Order, Producers, Distributors, and Users must implement the following treatment and control measures necessary to avoid pollution or nuisance and maintain the highest water quality consistent with the maximum benefit to the people of the state:

i. Implement treatment and use standards necessary to produce, as a minimum, disinfected secondary-23 recycled water and implement the applicable Title 22 Requirements;

ii. Identify and implement best management practices; and,

iii. Develop, maintain, and implement an O&M Plan; and Trained personnel (e.g., recycled water supervisor).

D. **GENERAL PROVISIONS**

1. The Producers or Distributors, shall document compliance with all conditions of this Order and of water reuse criteria in Title 17 and Title 22 of the California Code of regulations.

2. If any condition or criteria set forth in this Order conflicts or is inconsistent with any requirement set forth in any State regulation or State board Policy, the more stringent condition or criterion shall apply.

3. The Producers, Distributors (if any), and Users shall allow the Board or its authorized representatives, in accordance with Section 13267(c) or other relevant provisions of the California Water Code:

a. Entry upon premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order;

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b. Access to and copy of, at reasonable times, any records that must be kept under the conditions of this Order;

c. Inspection, at reasonable times, of any facility, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and

d. To sample or monitor, at reasonable times, for the purpose of ensuring compliance with this Order.

4. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:

   a. Violation of any term or condition contained in this Order;

   b. Obtaining this Order by misrepresentation, or failure to disclose fully all relevant facts;

   c. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized reuse;

   d. Endangerment to public health or environment that can only be regulated to acceptable levels by Order modification or termination.

5. The Executive Officer may add additional Producers at any time, pursuant to conditions specified in Provisions D. 1 and D. 2.

6. The Executive Officer upon a finding of non-compliance with this Order, may revoke a Producer's authority to issue Water Reuse Permits.

7. The Board will review this Order periodically and may revise the requirements as deemed necessary.

8. Any aggrieved person may petition the State Water Resources Control Board to review the decision of the Regional Board regarding the final Order. The petition must be submitted within 30 days of the Regional Board's action to the following address:

   State Water Resources Control Board
   Office of Chief Counsel
   P.O. Box 100, 1001 I Street
   Sacramento, CA 95812-0100

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E. EFFECTIVE DATE OF THE ORDER

This Order takes effect upon its adoption.

I, Tracy J. Egoscue, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Los Angeles Region on March 5, 2009.

Tracy J. Egoscue
Executive Officer

/DTSAI/

Attachments:
A. Definition of Terms
B. Title 22 Chapter 3 Water Recycling Criteria
C. Monitoring and Reporting Program
D. Notice of Intent (NOI) General Instructions and Form
E. Best Management Practices of Additional Site Specific Requirements
F. Standard Provisions Applicable to Waste Discharge Requirements

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ATTACHMENT A

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

DEFINITION OF TERMS FOR
GENERAL WATER REUSE ORDER NO. R4-2009-XXXX

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Within this General Order, the following terms are defined as follows:

California Department of Public Health (CDPH): The primary State agency responsible for protection of public health and the regulation of drinking water. The Legislature has defined several specific regulatory responsibilities of the CDPH related directly or indirectly to recycled water use activities including: establishment of statewide water reclamation criteria advising Regional Water Boards in the drafting of water reclamation requirements; review and approval of certain proposed water reclamation projects; abatement of contamination resulting from use of reclaimed water where public health is seriously threatened; and control of cross connections between potable and nonpotable water systems.

Coagulated Wastewater: Coagulated wastewater means oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated upstream from a filter by the addition of suitable floc-forming chemicals.

Disinfected Recycled (Reclaimed) Water: Water is as a result of treatment of municipal wastewater in which the pathogenic organisms have been destroyed by chemical, physical or biological means, This water is suitable for a direct beneficial use or a controlled use that would not otherwise occur and is therefore considered a valuable resource. "Recycled water" and "reclaimed water" have the same meaning. Three different levels of disinfected recycled water include disinfected secondary-23 and disinfected tertiary. See the following definitions;

Disinfected Secondary-2.2: Adequately disinfected, oxidized wastewater in which the median number of coliform organisms in the effluent does not exceed 2.2 per 100 milliliters, as determined from the bacteriological results of the last seven days for which analyses have been completed, and the number of coliform organisms does not exceed 23 per 100 milliliters in more than one sample in any 30 day period.

Disinfected Secondary-23: Adequately disinfected, oxidized wastewater in which the median number of coliform organisms in the effluent does not exceed 23 per 100 milliliters, as determined from the bacteriological results of the last seven days for which analyses have been completed, and the number of coliform organisms does not exceed 240 per 100 milliliters in more than one sample in any 30 day period.

Disinfected Tertiary: Adequately disinfected, oxidized, coagulated, clarified, filtered wastewater in which meets the following criteria:

(a) A filtered wastewater which has been disinfected by either:

(1) A chlorine disinfection process that provides a CT (chorine concentration times modal contact time) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak daily design flow (or an equivalent combination of chlorine residual concentration and contact time subject to Executive Officer approval); or

(2) A disinfection process that, when combined with the filtration process, has been demonstrated to reduce the concentration of plaque-forming units of F-specific bacteriophage MS-2, or polio virus, per unit volume of water in the wastewater to one hundred thousandths (1/100,000) of the initial concentration in the filter influent throughout the range of qualities of wastewater that will occur during the reuse process. A virus that is at least a resistant to disinfection as polio virus may be used for purposes of the demonstration.

(b) The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed maximum an MPN of 23 per 100 milliliters in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.

Dual Plumbed System: A system that utilizes separate piping systems for recycled water and potable water within a facility and where the reclaimed water is used for either of the following purposes:

(a) To serve multiple plumbed outlets used by the public within a building.

(b) Landscape irrigation at individual residences.

Engineering Report: Refers to a report filed with the CDPH to produce or supply recycled water for direct reuse. The report shall clearly indicate the means for compliance with the Title 22 regulations. (Title 22 section 60323).

Filtered Wastewater: An oxidized wastewater that meets the criteria in subsection (a) or (b):

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(a) Has been coagulated and passed through natural undisturbed soils or a bed of filter media pursuant to the following:

(1) At a rate that does not exceed 5 gallons per minute per square foot of surface area in mono, dual or mixed media gravity, upflow or pressure filtration systems, or does not exceed 2 gallons per minute per square foot of surface area in traveling bridge automatic backwash filters; and,

(2) So that the turbidity of the filtered wastewater does not exceed any of the following:

i. An average of 2 NTU within a 24-hour period;

ii. 5 NTU more than 5 percent of the time within a 24-hour period; and,

iii. 10 NTU at any time.

(b) Has been passed through a microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane so that the turbidity of the filtered wastewater does not exceed any of the following:

(1) 0.2 NTU more than 5 percent of the time within a 24-hour period; and,

(2) 0.5 NTU at any time.

Incidental Runoff: Refers to unintended small amounts (volume) of runoff from recycle water use areas, such as over-spray from sprinklers that escapes the recycled water use area. Water leaving a recycled water use area as part of the facility design, excessive application, intentionally overflowed or applied, or due to negligence is not considered incidental.

Recycled Water Distributor (Distributor): A municipal or water service agency which receives recycled water from a Producer for the purpose of distribution to users. The Distributor may provide additional treatment to the water, depending upon the intended use.

Recycled Water Producer (Producer): The entity which treats domestic wastewater to obtain recycled water.

Recycled Water Supervisor: A person designated, by the Producer of recycled water, to discharge the responsibility of the Producer for: (a) acting as the supplier's coordinator and direct contact between the supplier and the owner or manager of the property upon which recycled water will be used; (b) proper operation of the system for transporting/distributing recycled water; (c) providing orientation to personnel involved in

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transporting/distributing recycled water; (d) implementing and complying with conditions of all Water Reuse Orders/Permits and associated documents relevant to use of recycled water; and (e) monitoring operations at the recycled water use area(s) for prevention of potential hazards.

Recycled Water Use Supervisor: A person designated, by the owner or manager of the property upon which recycled water will be applied, to discharge the responsibility of the owner or manager of the property for: (a) installation, operation and maintenance of a system that enables recycled water to be used; (b) for prevention of potential hazards; (C) implementing and complying with conditions of all Water Reuse Orders/Permits and associated documents; and (d) coordination with the cross-connection control program of the supplier of drinking water and the local health/environmental health agency. (A Recycled Water Supervisor and User Supervisor may be one in the same in some instances).

Recycled Water User (User): means a person or entity that uses recycled water.
Use Site Area (Site): An area of recycled water use with defined boundaries. A use site area may contain one or more facilities.

Water Agency: The public water system, or a publicly or privately owned or operated recycled water system, that delivers or proposes to deliver recycled water to a facility. (Title 22, section 60301.700)

Water Recycling Criteria: Uniform statewide recycling criteria established in California Code of Regulations Title 22 by the CDPH for each varying type of use of recycled water where the use involves the protection of public health (CWC section 13521).

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ATTACHMENT B

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

WATER RECYCLING CRITERIA FOR
GENERAL WATER REUSE ORDER NO. R4-2009-XXXX

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CHAPTER 3 WATER RECYCLING CRITERIA
ARTICLE 1 DEFINITIONS

60301. Definitions

60301.100. Approved laboratory

"Approved laboratory" means a laboratory that has been certified by the Department to perform microbiological analyses pursuant to section 116390, Health and Safety Code.

60301.160. Coagulated wastewater

"Coagulated wastewater" means oxidized wastewater in which colloidal and finely divided suspended matter have been destabilized and agglomerated upstream from a filter by the addition of suitable floc-forming chemicals.

60301.170. Conventional treatment

"Conventional treatment" means a treatment chain that utilizes a sedimentation unit process between the coagulation and filtration processes and produces an effluent that meets the definition for disinfected tertiary recycled water.

60301.200. Direct beneficial use

"Direct beneficial use" means the use of recycled water that has been transported from the point of treatment or production to the point of use without an intervening discharge to waters of the State.

60301.220. Disinfected secondary-2.2 recycled water

"Disinfected secondary-2.2 recycled water" means recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one

sample in any 30 day period.

60301.225. Disinfected secondary-23 recycled water

"Disinfected secondary-23 recycled water" means recycled water that has been oxidized and disinfected so that the median concentration of total coliform bacteria in the disinfected effluent does not exceed a most probable number (MPN) of 23 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed, and the number of total coliform bacteria does not exceed an MPN of 240 per 100 milliliters in more than one sample in any 30 day period.

60301.230. Disinfected tertiary recycled water

"Disinfected tertiary recycled water" means a filtered and subsequently disinfected wastewater that meets the following criteria:

(a) The filtered wastewater has been disinfected by either:

(1) A chlorine disinfection process following filtration that provides a CT (the product of total chlorine residual and modal contact time measured at the same point) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow; or

(2) A disinfection process that, when combined with the filtration process, has been demonstrated to inactivate and/or remove 99.999 percent of the plaque forming units of F-specific bacteriophage MS2, or polio virus in the wastewater. A virus that is at least as resistant to disinfection as polio virus may be used for purposes of the demonstration.

(b) The median concentration of total coliform bacteria measured in the disinfected effluent does not exceed an MPN of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria does not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30 day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.

60301.240. Drift

"Drift" means the water that escapes to the atmosphere as water droplets from a cooling system.

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60301.245. Drift eliminator

"Drift eliminator" means a feature of a cooling system that reduces to a minimum the generation of drift from the system.

60301.250. Dual plumbed system

"Dual plumbed system" or "dual plumbed" means a system that utilizes separate piping systems for recycled water and potable water within a facility and where the recycled water is used for either of the following purposes:

(a) To serve plumbing outlets (excluding fire suppression systems) within a building or

(b) Outdoor landscape irrigation at individual residences.

60301.300. F-Specific bacteriophage MS-2

"F-specific bacteriophage MS-2" means a strain of a specific type of virus that infects coliform bacteria that is traceable to the American Type Culture Collection (ATCC 15597B1) and is grown on lawns of E. coli (ATCC 15597).

60301.310. Facility

"Facility" means any type of building or structure, or a defined area of specific use that receives water for domestic use from a public water system as defined in section 116275 of the Health and Safety Code.

60301.320. Filtered wastewater

"Filtered wastewater" means an oxidized wastewater that meets the criteria in subsection (a) or (b):

(a) Has been coagulated and passed through natural undisturbed soils or a bed of filter media pursuant to the following:

(1) At a rate that does not exceed 5 gallons per minute per square foot of surface area in mono, dual or mixed media gravity, upflow or pressure filtration systems, or does not exceed 2 gallons per minute per square foot of surface area in traveling bridge automatic backwash filters; and

(2) So that the turbidity of the filtered wastewater does not exceed any of the following:

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(A) An average of 2 NTU within a 24-hour period;

(B) 5 NTU more than 5 percent of the time within a 24-hour period; and

(C) 10 NTU at any time.

(b) Has been passed through a microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane so that the turbidity of the filtered wastewater does not exceed any of the following:

(1) 0.2 NTU more than 5 percent of the time within a 24-hour period; and

(2) 0.5 NTU at any time.

60301.400. Hose bibb

"Hose bibb" means a faucet or similar device to which a common garden hose can be readily attached.

60301.600. Modal contact time

"Modal contact time" means the amount of time elapsed between the time that a tracer, such as salt or dye, is injected into the influent at the entrance to a chamber and the time that the highest concentration of the tracer is observed in the effluent from the chamber.

60301.630. NTU

"NTU" (Nephelometric turbidity unit) means a measurement of turbidity as determined by the ratio of the intensity of light scattered by the sample to the intensity of incident light as measured by method 2130 B. in Standard Methods for the Examination of Water and Wastewater, 20th ed.; Eaton, A. D., Clesceri, L. S., and Greenberg, A. E., Eds; American Public Health Association: Washington, DC, 1995; p. 2-8.

60301.650. Oxidized wastewater

"Oxidized wastewater" means wastewater in which the organic matter has been stabilized, is nonputrescible, and contains dissolved oxygen.

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60301.660. Peak dry weather design flow

"Peak Dry Weather Design Flow" means the arithmetic mean of the maximum peak flow rates sustained over some period of time (for example three hours) during the maximum 24-hour dry weather period. Dry weather period is defined as periods of little or no rainfall.

60301.700. Recycled water agency

"Recycled water agency" means the public water system, or a publicly or privately owned or operated recycled water system, that delivers or proposes to deliver recycled water to a facility.

60301.710. Recycling plant

"Recycling plant" means an arrangement of devices, structures, equipment, processes and controls which produce recycled water.

60301.740. Regulatory agency

"Regulatory agency" means the California Regional Water Quality Control Board(s) that have jurisdiction over the recycling plant and use areas.

Section 60301.830. Standby unit process

"Standby unit process" means an alternate unit process or an equivalent alternative process which is maintained in operable condition and which is capable of providing comparable treatment of the actual flow through the unit for which it is a substitute.

60301.900. Undisinfected secondary recycled water

"Undisinfected secondary recycled water" means oxidized wastewater.

60301.920. Use area

"Use area" means an area of recycled water use with defined boundaries. A use area may contain one or more facilities.

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ARTICLE 2. SOURCES OF RECYCLED WATER.

60302. Source specifications.

The requirements in this chapter shall only apply to recycled water from sources that contain domestic waste, in whole or in part.

ARTICLE 3. USES OF RECYCLED WATER.

60303. Exceptions

The requirements set forth in this chapter shall not apply to the use of recycled water onsite at a water recycling plant, or wastewater treatment plant, provided access by the public to the area of onsite recycled water use is restricted.

60306. Use of recycled water for cooling

(a) Recycled water used for industrial or commercial cooling or air conditioning that involves the use of a cooling tower, evaporative condenser, spraying or any mechanism that creates a mist shall be a disinfected tertiary recycled water.

(b) Use of recycled water for industrial or commercial cooling or air conditioning that does not involve the use of a cooling tower, evaporative condenser, spraying, or any mechanism that creates a mist shall be at least disinfected secondary-23 recycled water.

(c) Whenever a cooling system, using recycled water in conjunction with an air conditioning facility, utilizes a cooling tower or otherwise creates a mist that could come into contact with employees or members of the public, the cooling system shall comply with the following:

    (1) A drift eliminator shall be used whenever the cooling system is in operation.

    (2) A chlorine, or other, biocide shall be used to treat the cooling system recirculating water to minimize the growth of *Legionella* and other micro-organisms.

60307. Use of recycled water for other purposes

(a) Recycled water used for the following shall be disinfected tertiary recycled water, except that for filtration being provided pursuant to Section

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60301.320(a) coagulation need not be used as part of the treatment process provided that the filter effluent turbidity does not exceed 2 NTU, the turbidity of the influent to the filters is continuously measured, the influent turbidity does not exceed 5 NTU for more than 15 minutes and never exceeds 10 NTU, and that there is the capability to automatically activate chemical addition or divert the wastewater should the filter influent turbidity exceed 5 NTU for more than 15 minutes:

(1) Flushing toilets and urinals,

(2) Priming drain traps,

(3) Industrial process water that may come into contact with workers, Structural fire fighting,

(4) Decorative fountains,

(5) Commercial laundries,

(6) Consolidation of backfill around potable water pipelines, Artificial snow making for commercial outdoor use, and

(7) Consolidation of backfill around potable water pipelines,

(8) Artificial snow making for commercial outdoor use, and

(9) Commercial car washes, including hand washes if the recycled water is not heated, where the general public is excluded from the washing process.

(b) Recycled water used for the following uses shall be at least disinfected secondary23 recycled water:

(1) Industrial boiler feed,

(2) Nonstructural fire fighting,

(3) Backfill consolidation around nonpotable piping,

(4) Soil compaction,

(5) Mixing concrete,

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(6) Dust control on roads and streets,

(7) Cleaning roads, sidewalks and outdoor work areas and

(8) Industrial process water that will not come into contact with workers.

(c) Recycled water used for flushing sanitary sewers shall be at least undisinfected secondary recycled water.

ARTICLE 4. USE AREA

REQUIREMENTS.

60310. Use area requirements

(a) No irrigation with disinfected tertiary recycled water shall take place within 50 feet of any domestic water supply well unless all of the following conditions have been met:

(1) A geological investigation demonstrates that an aquitard exists at the well between the uppermost aquifer being drawn from and the ground surface.

(2) The well contains an annular seal that extends from the surface into the aquitard.

(3) The well is housed to prevent any recycled water spray from coming into contact with the wellhead facilities.

(4) The ground surface immediately around the wellhead is contoured to allow surface water to drain away from the well.

(5) The owner of the well approves of the elimination of the buffer zone requirement.

(b) No impoundment of disinfected tertiary recycled water shall occur within 100 feet of any domestic water supply well.

(c) No irrigation with, or impoundment of, disinfected secondary-2.2 or disinfected secondary-23 recycled water shall take place within 100 feet of any domestic water supply well.

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(d) No irrigation with, or impoundment of, undisinfected secondary recycled water shall take place within 150 feet of any domestic water supply well.

(e) Any use of recycled water shall comply with the following:

(1) Any irrigation runoff shall be confined to the recycled water use area, unless the runoff does not pose a public health threat and is authorized by the regulatory agency.

(2) Spray, mist, or runoff shall not enter dwellings, designated outdoor eating areas, or food handling facilities.

(3) Drinking water fountains shall be protected against contact with recycled water spray, mist, or runoff.

(f) No spray irrigation of any recycled water, other than disinfected tertiary recycled water, shall take place within 100 feet of a residence or a place where public exposure could be similar to that of a park, playground, or school yard.

(g) All use areas where recycled water is used that are accessible to the public shall be posted with signs that are visible to the public, in a size no less than 4 inches high by 8 inches wide, that include the following wording : "RECYCLED WATER - DO NOT DRINK". Each sign shall display an international symbol similar to that shown in figure 60310-A. The Department may accept alternative signage and wording, or an educational program, provided the applicant demonstrates to the Department that the alternative approach will assure an equivalent degree of public notification.

(h) Except as allowed under section 7604 of title 17, California Code of Regulations, no physical connection shall be made or allowed to exist between any recycled water system and any separate system conveying potable water.

(i) The portions of the recycled water piping system that are in areas subject to access by the general public shall not include any hose bibbs. Only quick couplers that differ from those used on the potable water system shall be used on the portions of the recycled water piping system in areas subject to public access.

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Water Recycling Criteria

FIGURE 60310-A

ARTICLE 5. DUAL PLUMBED RECYCLED WATER SYSTEMS.

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60313. General requirements.

(a) No person other than a recycled water agency shall deliver recycled water to a dual plumbed facility.

(b) No recycled water agency shall deliver recycled water for any internal use to any individually-owned residential units including free-standing structures, multiplexes, or condominiums.

(c) No recycled water agency shall deliver recycled water for internal use except for fire suppression systems, to any facility that produces or processes food products or beverages. For purposes of this Subsection, cafeterias or snack bars in a facility whose primary function does not involve the production or processing of foods or beverages are not considered facilities that produce or process foods or beverages.

(d) No recycled water agency shall deliver recycled water to a facility using a dual plumbed system unless the report required pursuant to section 13522.5 of the Water Code, and which meets the requirements set forth in section 60314, has been submitted to, and approved by, the regulatory agency.

60314. Report submittal

(a) For dual-plumbed recycled water systems, the report submitted pursuant to section 13522.5 of the Water Code shall contain the following information in addition to the information required by section 60323:

(1) A detailed description of the intended use area identifying the following:

(A) The number, location, and type of facilities within the use area proposing to use dual plumbed systems,

(B) The average number of persons estimated to be served by each facility on a daily basis,

(C) The specific boundaries of the proposed use area including a map showing the location of each facility to be served,

(D) The person or persons responsible for operation of the dual plumbed system at each facility, and

(E) The specific use to be made of the recycled water at each facility.

(2) Plans and specifications describing the following:

(A) Proposed piping system to be used,

(B) Pipe locations of both the recycled and potable systems,

(C) Type and location of the outlets and plumbing fixtures that will be accessible to the public, and

(D) The methods and devices to be used to prevent backflow of recycled water into the public water system.

(3) The methods to be used by the recycled water agency to assure that the installation and operation of the dual plumbed system will not result in cross connections between the recycled water piping system and the potable water piping system. This shall include a description of pressure, dye or other test methods to be used to test the system every four years.

(b) A master plan report that covers more than one facility or use site may be submitted provided the report includes the information required by this section. Plans and specifications for individual facilities covered by the report may be submitted at any time prior to the delivery of recycled water to the facility.

60315. Design requirements

The public water supply shall not be used as a backup or supplemental source of water for a dual-plumbed recycled water system unless the connection between the two systems is protected by an air gap separation which complies with the requirements of sections 7602 (a) and 7603 (a) of title 17, California Code of Regulations, and the approval of the public water system has been obtained.

60316. Operation requirements

(a) Prior to the initial operation of the dual-plumbed recycled water system and annually thereafter, the Recycled Water Agency shall ensure that the dual plumbed system within each facility and use area is inspected for possible cross connections with the potable water system. The recycled water system shall also be tested for possible cross connections at least once every four years. The testing shall be conducted in accordance with the method described in the report submitted pursuant to section 60314. The inspections and the testing shall be performed by a cross connection control specialist certified by the California-Nevada section of the American Water Works

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Association or an organization with equivalent certification requirements. A written report documenting the result of the inspection or testing for the prior year shall be submitted to the department within 30 days following completion of the inspection or testing.

(b) The recycled water agency shall notify the department of any incidence of backflow from the dual-plumbed recycled water system into the potable water system within 24 hours of the discovery of the incident.

(c) Any backflow prevention device installed to protect the public water system serving the dual-plumbed recycled water system shall be inspected and maintained in accordance with section 7605 of Title 17, California Code of Regulations.

ARTICLE 5.5. OTHER METHODS OF TREATMENT

60320.5. Other methods of treatment

Methods of treatment other than those included in this chapter and their reliability features may be accepted if the applicant demonstrates to the satisfaction of the State Department of Health that the methods of treatment and reliability features will assure an equal degree of treatment and reliability.

ARTICLE 6. SAMPLING AND ANALYSIS 60321. Sampling and analysis

(a) Disinfected secondary-23, disinfected secondary-2.2, and disinfected tertiary recycled water shall be sampled at least once daily for total coliform bacteria. The samples shall be taken from the disinfected effluent and shall be analyzed by an approved laboratory.

(b) Disinfected tertiary recycled water shall be continuously sampled for turbidity using a continuous turbidity meter and recorder following filtration. Compliance with the daily average operating filter effluent turbidity shall be determined by averaging the levels of recorded turbidity taken at four-hour intervals over a 24-hour period. Compliance with turbidity pursuant to section 60301.320 (a)(2)(B) and (b)(1) shall be determined using the levels of recorded turbidity taken at intervals of no more than 1.2-hours over a 24hour period. Should the continuous turbidity meter and recorder fail, grab sampling at a minimum frequency of 1.2-hours may be substituted for a period of up to 24-hours. The results of the daily average turbidity determinations shall be reported quarterly to the regulatory agency.

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(c) The producer or supplier of the recycled water shall conduct the sampling required in subsections (a) and (b).

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ARTICLE 7. ENGINEERING REPORT AND OPERATIONAL REQUIREMENTS

60323. Engineering report

(a) No person shall produce or supply reclaimed water for direct reuse from a proposed water reclamation plant unless he files an engineering report.

(b) The report shall be prepared by a properly qualified engineer registered in California and experienced in the field of wastewater treatment, and shall contain a description of the design of the proposed reclamation system. The report shall clearly indicate the means for compliance with these regulations and any other features specified by the regulatory agency.

(c) The report shall contain a contingency plan which will assure that no untreated or inadequately treated wastewater will be delivered to the use area.

60325. Personnel

(a) Each reclamation plant shall be provided with a sufficient number of qualified personnel to operate the facility effectively so as to achieve the required level of treatment at all times.

(b) Qualified personnel shall be those meeting requirements established pursuant to Chapter 9 (commencing with Section 13625) of the Water Code.

60327. Maintenance

A preventive maintenance program shall be provided at each reclamation plant to ensure that all equipment is kept in a reliable operating condition.

60329. Operating records and reports

(a) Operating records shall be maintained at the reclamation plant or a central depository within the operating agency. These shall include: all analyses specified in the reclamation criteria; records of operational problems, plant and equipment breakdowns, and diversions to emergency storage or disposal; all corrective or preventive action taken.

(b) Process or equipment failures triggering an alarm shall be recorded and maintained as a separate record file. The recorded information shall include the time and cause of failure and corrective action taken.

(c) A monthly summary of operating records as specified under (a) of this section shall be filed monthly with the regulatory agency.

(d) Any discharge of untreated or partially treated wastewater to the use area, and the cessation of same, shall be reported immediately by telephone to the regulatory agency, the State Department of Health, and the local health officer.

60331. Bypass

There shall be no bypassing of untreated or partially treated wastewater from the reclamation plant or any intermediate unit processes to the point of use.

ARTICLE 8. GENERAL REQUIREMENTS OF DESIGN

60333. Flexibility of design

The design of process piping, equipment arrangement, and unit structures in the reclamation plant must allow for efficiency and convenience in operation and maintenance and provide flexibility of operation to permit the highest possible degree of treatment to be obtained under varying circumstances.

60335. Alarms

(a) Alarm devices required for various unit processes as specified in other sections of these regulations shall be installed to provide warning of:

(1) Loss of power from the normal power supply.

(2) Failure of a biological treatment process.

(3) Failure of a disinfection process.

(4) Failure of a coagulation process.

(5) Failure of a filtration process.

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(6) Any other specific process failure for which warning is required by the regulatory agency.

(b) All required alarm devices shall be independent of the normal power supply of the reclamation plant.

(c) The person to be warned shall be the plant operator, superintendent, or any other responsible person designated by the management of the reclamation plant and capable of taking prompt corrective action.

(d) Individual alarm devices may be connected to a master alarm to sound at a location where it can be conveniently observed by the attendant. In case the reclamation plant is not attended full time, the alarm(s) shall be connected to sound at a police station, fire station or other full time service unit with which arrangements have been made to alert the person in charge at times that the reclamation plant is unattended.

60337. Power supply

The power supply shall be provided with one of the following reliability features:

(a) Alarm and standby power source.

(b) Alarm and automatically actuated short-term retention or disposal provisions as specified in Section 60341.

(c) Automatically actuated long-term storage or disposal provisions as specified in Section 60341.

ARTICLE 9. RELIABILITY REQUIREMENTS FOR PRIMARY EFFLUENT

60339. Primary treatment

Reclamation plants producing reclaimed water exclusively for uses for which primary effluent is permitted shall be provided with one of the following reliability features:

(a) Multiple primary treatment units capable of producing primary effluent with one unit not in operation.

(b) Long-term storage or disposal provisions as specified in Section 60341.

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Note: Use of primary effluent for recycled water is no longer allowed. [repeal of Section 60309, *effective December 2000]*

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ARTICLE 10. RELIABILITY REQUIREMENTS FOR FULL TREATMENT

60341. Emergency storage or disposal

(a) Where short-term retention or disposal provisions are used as a reliability feature, these shall consist of facilities reserved for the purpose of storing or disposing of untreated or partially treated wastewater for at least a 24-hour period. The facilities shall include all the necessary diversion devices, provisions for odor control, conduits, and pumping and pump back equipment. All of the equipment other than the pump back equipment shall be either independent of the normal power supply or provided with a standby power source.

(b) Where long-term storage or disposal provisions are used as a reliability feature, these shall consist of ponds, reservoirs, percolation areas, downstream sewers leading to other treatment or disposal facilities or any other facilities reserved for the purpose of emergency storage or disposal of untreated or partially treated wastewater. These facilities shall be of sufficient capacity to provide disposal or storage of wastewater for at least 20 days, and shall include all the necessary diversion works, provisions for odor and nuisance control, conduits, and pumping and pump back equipment. All of the equipment other than the pump back equipment shall be either independent of the normal power supply or provided with a standby power source.

(c) Diversion to a less demanding reuse is an acceptable alternative to emergency disposal of partially treated wastewater provided that the quality of the partially treated wastewater is suitable for the less demanding reuse.

(d) Subject to prior approval by the regulatory agency, diversion to a discharge point which requires lesser quality of wastewater is an acceptable alternative to emergency disposal of partially treated wastewater.

(e) Automatically actuated short-term retention or disposal provisions and automatically actuated long-term storage or disposal provisions shall include, in addition to provisions of (a), (b), (c), or (d) of this section, all the necessary sensors, instruments, valves and other devices to enable fully automatic diversion of untreated or partially treated wastewater to approved emergency storage or disposal in the event of failure of a treatment process and a manual reset to prevent automatic restart until the failure is corrected.

60343. Primary treatment

All primary treatment unit processes shall be provided with one of the following reliability features:

(a) Multiple primary treatment units capable of producing primary effluent with one unit not in operation.

(b) Standby primary treatment unit process.

(c) Long-term storage or disposal provisions.

60345. Biological treatment

All biological treatment unit processes shall be provided with one of the following reliability features:

(a) Alarm and multiple biological treatment units capable of producing oxidized wastewater with one unit not in operation.

(b) Alarm, short-term retention or disposal provisions, and standby replacement equipment.

(c) Alarm and long-term storage or disposal provisions.

(d) Automatically actuated long-term storage or disposal provisions.

60347. Secondary sedimentation

All secondary sedimentation unit processes shall be provided with one of the following reliability features:

(a) Multiple sedimentation units capable of treating the entire flow with one unit not in operation.

(b) Standby sedimentation unit process.

(c) Long-term storage or disposal provisions.

60349. Coagulation

(a) All coagulation unit processes shall be provided with the following mandatory features for uninterrupted coagulant feed:

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(1) Standby feeders,

(2) Adequate chemical stowage and conveyance facilities,

(3) Adequate reserve chemical supply, and

(4) Automatic dosage control.

(b) All coagulation unit processes shall be provided with one of the following reliability features:

(1) Alarm and multiple coagulation units capable of treating the entire flow with one unit not in operation;

(2) Alarm, short-term retention or disposal provisions, and standby replacement equipment;

(3) Alarm and long-term storage or disposal provisions;

(4) Automatically actuated long-term storage or disposal provisions, or

(5) Alarm and standby coagulation process.

60351. Filtration

All filtration unit processes shall be provided with one of the following reliability features:

(a) Alarm and multiple filter units capable of treating the entire flow with one unit not in operation.

(b) Alarm, short-term retention or disposal provisions and 'standby replacement equipment.

(c) Alarm and long-term storage or disposal provisions.

(d) ,Automatically actuated long-term storage or disposal provisions.

(e) Alarm and standby filtration unit process.

Section 60353. Disinfection

(a) All disinfection unit processes where chlorine is used as the disinfectant shall be provided with the following features for uninterrupted chlorine feed:

TENTATIVE

(1) Standby chlorine supply,

(2) Manifold systems to connect chlorine cylinders,

(3) Chlorine scales, and

(4) Automatic devices for switching to full chlorine cylinders.

Automatic residual control of chlorine dosage, automatic measuring and recording of chlorine residual, and hydraulic performance studies may also be required.

(b) All disinfection unit processes where chlorine is used as the disinfectant shall be provided with one of the following reliability features:

(1) Alarm and standby chlorinator;

(2) Alarm, short-term retention or disposal provisions, and standby replacement equipment;

(3) Alarm and long-term storage or disposal provisions;

(4) Automatically actuated long-term storage or disposal provisions; or

(5) Alarm and multiple point chlorination, each with independent power source, separate chlorinator, and separate chlorine supply.

60355. Other alternatives to reliability requirements

Other alternatives to reliability requirements set forth in Articles 8 to 10 may be accepted if the applicant demonstrates to the satisfaction of the State Department of Health that the proposed alternative will assure an equal degree of reliability.

TENTATIVE

ATTACHMENT C

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

MONITORING AND REPORTING PROGRAM FOR
GENERAL WATER REUSE ORDER NO. R4-2009-XXXX

TENTATIVE

I. GENERAL

This Monitoring and Reporting Program (MRP) is issued pursuant to California Water Code section 13267(f). Changes to monitoring shall be established with concurrence of Los Angeles Regional Water Quality Control Board staff, and a description of the revised stations shall be submitted. All samples should be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each sample shall be recorded on the sample chain of custody form. All analyses shall be performed in accordance with the latest edition of *Guidelines Establishing Test Procedures for Analysis of Pollutants*, promulgated by the United States Environmental Protection Agency (US-EPA) or other procedures approved by the Regional Water Quality Control Board, Los Angeles Region (Regional Board). In reporting monitoring data, the Producer or Distributor shall indicate whether any analysis was performed using a method not in conformance with US-EPA's Guidelines.

The principal purposes of the MRP are:

A. To document compliance with water quality requirements and prohibitions established by this Regional Board; and,

B. To facilitate self-policing by the water recyclers.

II. RECYCLED WATER MONITORING

A Producer shall develop and implement a MRP. When the User(s) is other than the Producer, delegation of responsibilities must be clearly spelled out and included in the Producer's Water Use Permits.

A. Recycled Water Effluent Quality - Producer Program

The Producer's MRP is applicable during periods when recycled water is in use. The MRP shall include the observations, sampling, measurements, and analyses prescribed in Table 1 on Page C-5.

The sampling station shall be established where representative samples of treated and disinfected effluent (effluent) water can be obtained. The treated

effluent samples shall be obtained from the effluent channel downstream of the chlorine contact basin. Should there be any change in the sampling station, the proposed station shall be approved by the Executive Officer prior to its use.

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B. Monitoring of Recycled Water Users - Producer/User Program

1. Self-Monitoring Program

The Producer will set individual user monitoring requirements based on the size, volume used, complexity, etc. of each use area. Producer conducted monitoring, or user self-monitoring if approved by the Producer, shall be conducted at least annually.

All recycled use areas, while recycled water is being used, shall be inspected at a frequency, specified by the Producer's Water Reuse Permit, for the following deficiencies or violations of use:

a. Standard Observations

i. Evidence of runoff of recycled water from the site may affect surface water or impair groundwater (show affected area on a sketch, estimate volume).

ii. Odor of wastewater origin from irrigation site. If present, indicate apparent source, characterization, and direction of travel.

iii. Evidence of ponding of recycled water, and evidence of mosquitoes breeding within the irrigation area due to ponded water.

iv. Warning signs properly posted to inform public that irrigation or water use is recycled water which is not safe for drinking.

v. Evidence of leaks or breaks in the irrigation system pipelines or tubing.

vi. Evidence of broken, or otherwise faulty drip irrigation system emitters or spray irrigation sprinklers.

vii. Evidence of overflows, leaks, erosion of dikes, etc. of storage pond(s) or impoundment(s).

All violations shall be followed by a discussion of when and how deficiencies were corrected.

b. Description of Sampling and Observation Stations

i. Land Observation Stations (L-1 to L-n): Locations at a sufficient number of points at reuse areas in order to ensure compliance with water reuse requirements.

ii. Impoundment Stations (P-1 to P-n): Locations at points along the periphery of each storage, ornamental, golf course, or other pond or impoundment.

2. Inspection Program

A Producer shall also conduct periodic random inspections of Users to ensure compliance with CDPH reuse criteria and the Water Reuse Permit. Inspections shall be performed when recycled water is being used. Any significant repairs or modifications made to the system involving compliance with this Order shall be described in the Annual Report.

III. REPORTING REQUIREMENTS

A. Significant Violation Reporting

Violations of the CDPH's water recycling criteria that impact or threaten to impact public health or water quality shall be reported to the Board by phone within 24 hours, followed by a written report within 15 days describing corrective actions taken.

B. Annual Report to the Regional Board

An annual report for each calendar year shall be submitted to the Board by the Producer by March 15 of each year. The report shall contain a statement by the reporting official, under penalty of perjury, that to the best of the signer's knowledge the report is true and correct. The report shall include the following:

1. Tabulation of SMP recycled water analyses (see Table 1).

2. A tabular summary of recycled water use by billing period by each User.

TENTATIVE

3. A list of new authorized recycled water Users, including the name of customers, application, source and projected annual flow to be delivered.

4. A summary of the total daily recycled water delivered by the Producer.

5. Tabulation of User site inspections conducted by the Producer.

6. A summary of effluent violations related to recycled water use, violations found during inspection of reuse sites, corrective actions taken and any changes to, or revoking of User authorizations by the Producer.

7. An update regarding current and future development of the water recycling program, including planning, design and construction of facilities, preparation of required reports and technical documents and progress toward regulatory approvals.

8. Progress and evaluation of any special studies or projects being undertaken related to the program.

I, Tracy J. Egoscue, Executive Officer, do hereby certify that the foregoing Monitoring and Reporting Program is effective on the date shown below and may be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the Producers. Revisions to the Monitoring and Reporting Program will be authorized in writing by the Executive Officer.

Tracy J. Egoscue
Executive Officer

Date: March 5, 2009

/DTSAI/

TENTATIVE

Table 1 Producer's Schedule Sampling and Analyses

Parameter (Unit)	Sampling Location			
	E-001		L(s)	P(s)
	Sampling Type and Minimal Frequency			
	Grab	Continuous	Observation	Observation
Flow rate (gallon/day)	---	√	Daily[1]	Daily[1]
Total coliform (MPN/100mL)	Daily[2,3]	---	---	---
Turbidity (NTU)	---	Daily[2,3]	---	---
Dissolved oxygen (mg/L)	3/Week[2]	---	---	---
Dissolved sulfides (mg/L) (if DO < 1mg/L)	3/Week[2]	---	---	---
Standard observations	---	---	Annually[4]	Annually[4]

T E N T A T I V E

[1] Records of recycled water use at each site may be complied from billing period readings (divided by number of days to obtain daily flow) and submitted with the annual report.

[2] Equivalent routine effluent (NPDES/WDR) monitoring data collected on days and during times (grab samples) recycled water is being produced can be submitted in fulfillment of these requirements.

[3] Unless current NPDES or WDR sampling frequency is less. Turbidity would apply to tertiary-treated recycled water only and is based on a 24-hour composite sample.

[4] User sites to be inspected a minimum of annually for "Applicable Standard Observations" based on the size and complexity of each site in accordance with the Producer's Water Reuse Program.

ATTACHMENT D

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

NOTICE OF INTENT (NOI) -- GENERAL INSTRUCTIONS FOR GENERAL WATER REUSE ORDER NO. R4-2009-XXXX

TENTATIVE

Who May Apply

This Order is intended to serve as a regional-wide general permit for publicly owned wastewater agencies that recycle wastewater. It is intended to replace individual reuse Orders and applies to the following:

A. Producers of secondary and tertiary recycled water that meets Title 22 criteria and is reused for a direct beneficial use or a controlled use that would not otherwise occur.

B. Distributors of recycled water receive wastewater from a municipal facility, further treats it to meet Title 22 criteria for its intended use(s) and distributes it to users. In some cases, a written agreement (i.e. Joint Powers Agreement) between a Producer and a Distributor may be used in lieu of issuing this Order to the Distributor.

Producers that have received an individual Order and previously submitted information equivalent to that required in the Water Reuse Program Report below, may submit a letter as a Notice of Intent without duplicating the material.

Where to Apply

The NOI should be mailed to the Regional Water Quality Control Board at the following address:

Regional Water Quality Control Board
Los Angeles Region
320 4th Street Suite 200, Los Angeles, CA 90013
Attn: Section Chief of Watershed Regulatory Section

A copy of the NOI shall also be mailed to the California Department of Public Health at the following address:

California Department of Public Health
Recycled Water Unit
1180 Eugenia Place, Suite 200
Carpintaria , CA 93013

When to Apply

An applicant should file the NOI 60 days prior to project start.

What to File

The NOI shall include a Water Reuse Program technical report, containing the following as a minimum:

SECTION I - **FACILITY/WASTE TREATMENT INFORMATION**

Description of existing and/or proposed treatment, storage and transmission facilities for water reuse (much of this may be from current Orders/reports, but should be updated). This should include the type and level of wastewater treatment for reuse applications and estimated seasonal flows of recycled water.

SECTION II - **REUSE APPLICATIONS**

Describe the types of applications recycled water will be used for. This should include:

A. Agency owned/controlled uses (e.g. acreage/locations)

B. Contracted User Applications

1. List of Users receiving or proposing to receive recycled water (including a list of uses of recycled water for each user);

2. The estimated amount of recycled water flows to each User; and,

3. Descriptions/maps of designated use areas.

SECTION III - **DESCRIPTION OF WATER REUSE PERMIT PROGRAM**

The Agency's water reuse program should be fully described as follows:

A. Copy of agency's authority and proposed rules and/or regulations;

TENTATIVE

B. Design and implementation of program;

C. Cross connection testing responsibilities and procedures;

D. Self-monitoring program;

E. User Inspection Program;

F. O&M program;

G. Compliance program;

H. Employee (user) Training; and,

I. Emergency procedures & notification

SECTION IV - ADDITIONAL SITE SPECIFIC CONDITIONS

If existing Orders have additional site specific conditions and/or restrictions not covered in the General Order, they should be described here.

SECTION V - REUSE PROGRAM ADMINISTRATION

Describe organization and responsibilities of pertinent personnel involved in the water reuse program. Provide the name(s), title(s) and phone number(s) of contact person(s) who are charged with operation/oversight of the water reuse program.

GENERAL WATER REUSE
NOTICE OF INTENT (NOI) – FORM

I. Use Area/Location Information (Required):

Facility:		
Street (Including address if any):		
Nearest Cross Street(s):		
County:	Total Application Area (Acres):	Anticipated Avg. Annual Volume (Ac-ft):

Type of Reuse (Check all that apply):

☐ Industrial boiler feed ☐ Nonstructural fire fighting ☐ Backfill consolidation around nonpotable piping
☐ Soil compaction ☐ Mixing concrete ☐ Dust control on roads and streets
☐ Cleaning roads, sidewalks, and outdoor work areas
☐ Industrial process water that will not come into contact with workers

Township/Range/Section: T _____, R_____, Section _____, ___ ___ B&M

Latitude/Longitude (From Center): ___ Deg. _____ Min. __ ___Sec N. __ ___Deg. __ ___Min. __ __ Sec. W
Method of data collection: _____.

Assessor Parcel Number: _____. _____. _____. (attach extra sheets if needed)

Attach a map (e.g., USGS 7.5" topographic map) showing the proposed application site. The map should also show run-on/runoff controls, storage areas, nearby surface waters, wells, and the application areas including setback and buffer zones.

II. Use Area Property Owner (User) (Required):

Agency / Organization:			
Existing Water Reclamation Requirements (if any):		Do you request to rescind the identified existing WRRs? ☐Yes ☐ No	
Mailing Address:			
City:	County:	State:	Zip:
Phone Number:		Fax Number:	
Contact Person:	Title:	E-Mail:	

III. On-Site Supervisor (Required):

Agency / Organization / Name:			
Mailing Address:			
City:	County:	State:	Zip:
Phone Number:		Fax Number:	
Contact Person:		E-Mail:	

IV. Billing Address (Required):

Agency / Organization / Name:			
Mailing Address:			
City:	County:	State:	Zip:
Phone Number:	Fax Number:		
Contact Person:	E-Mail:		

V. Producer (Required):

Agency / Organization:			
Facility:			
Order Number:	WDID:	Treatment: ☐ Disinfected Secondary[1] ☐ Disinfected Secondary[1]	
Mailing Address:			
City:	County:	State:	Zip:
Phone Number:	Fax Number:		
Contact Person:	E-Mail:		

VI. Distributor (Required):

Agency / Organization / Name:			
Facility, if any:			
Mailing Address:			
City:	County:	State:	Zip:
Phone Number:	Fax Number:		
Contact Person:	E-Mail:		

VII. Certification

I hereby agree to meet and follow the requirements set forth in Water Reuse Order No. R4-2009-XXXX.. I also agree to adhere to the Operation & Maintenance Plan, submitted herewith, and to ensure the proper use of recycled water for landscape applications. I declare under the penalty of law that I have personally examined and am familiar with the information submitted in this document, and that based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of a fine and imprisonment.

[1] As defined in California Code of Regulations Title 22, sections 60301.230 and 60301.320

I.	Signature of Use Area Property Owner (User) :	Title:
	Printed or Typed Name:	Date:
II.	Signature of Producer:	Title:
	Printed or Typed Name:	Date:
III.	Signature of Distributor:	Title:
	Printed or Typed Name:	Date:

REGIONAL BOARD USE ONLY

WDID:	Regional Board Office:	Date NOI Received (MM/DD/YYYY) :	Date NOI Approved (MM/DD/YYYY):
		_ _/_ _ /_ _ _ _	_ _/_ _ /_ _ _ _

Fee Amount Received: $_____ . ____	Check #: _____	Fee Code:_____

Nearby Surface Water: _____ Hydrologic Unit: _____. Hydrologic Area (HA): _____.

Beneficial Uses of Surface Waters within HA (Select all that apply):

- ☐ Agricultural Supply (AGR)
- ☐ Aquaculture (AQUA)
- ☐ Cold Freshwater Habitat (COLD)
- ☐ Ground Water Recharge (GWR)
- ☐ Preservation of Rare, Endangered, or Threatened Species (RARE)
- ☐ Fresh Water Replenishment of Salton Sea (FRSH)
- ☐ Hydropower Generation (POW)
- ☐ Industrial Service Supply (IND)
- ☐ Municipal Supply (MUN)
- ☐ Noncontact Water Recreation (REC II)
- ☐ Other: _____.
- ☐ Warm Water Habitat (WARM)
- ☐ Water Contact Recreation (REC I)
- ☐ Wildlife Habitat (WILD)

Detailed Analysis Unit (DAU): _____.

Beneficial Uses of Groundwaters within DAU (Select all that apply):

- ☐ Agricultural Supply (AGR)
- ☐ Aquaculture (AQUA)
- ☐ Industrial Process Supply (PRO)
- ☐ Industrial Service Supply (IND)
- ☐ Municipal Supply (MUN)
- ☐ Noncontact Water Recreation (REC II)
- ☐ Water Contact Recreation (REC I)
- ☐ Wildlife Habitat (WILD)
- ☐ Other: _____.

ATTACHMENT E

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

BEST MANAGEMENT PRACTICES OF
ADDITIONAL SITE SPECIFIC REQUIREMENTS FOR
GENERAL WATER REUSE ORDER NO. R4-2009-XXXX

TENTATIVE

I. GENERAL OPERATIONAL CONTROLS

A. All recycled water piping and appurtenances in new installations and appurtenances in retrofit installations shall be colored purple or distinctively wrapped with purple tape in accordance with California Health and Safety Code section 116815(a).

B. Where feasible, different piping materials should be used to assist in water system identification.

C. All recycled water valves and outlets shall be properly tagged to warn the public and employees that the water is not safe for drinking.

D. All recycled water valves, outlets and sprinkler heads should be of a type that can only be operated by designated personnel.

E. Only quick couplers that differ from those used on the potable water system shall be used on the portions of the recycled water piping system in areas subject to public access.

F. The recycled water piping system shall not include any hose bibs. The use or installation of hose bibbs on any on-site water system that presently operates or is designed to operate with recycled water, regardless of the hose bibb style, construction or identification is strictly prohibited.

G. No physical connection shall be made or allowed to exist between any recycled water system and any separate system conveying potable water.

H. The use of recycled water shall at no time create odors, slime, deposits, become a public or private nuisance or create a trespass of any kind.

I. The use area shall be maintained to prevent the breeding of flies, mosquitoes or other vectors.

J. Recycled water facilities shall be operated to prevent direct human consumption of recycled water and to minimize misting, ponding, and runoff.

K. The recycled water user supervisor should attend regular training regarding the safe and efficient operation and maintenance of recycled water use facilities.

L. The recycled water use supervisor shall ensure that all recycled water facilities are maintained, operated and repaired at all times in a manner that does not cause illness or injury to any person and in a manner that does not cause damage or injury to the real or personal property of any person or entity.

M. The User shall notify the Executive Director in writing within thirty (30) days of change any changes to recycled water user supervisor personnel or contact information for the recycled water user supervisor.

N. Regular inspections shall be conducted to assure cross connection are not made with potable water systems and air-gap devices are installed and operable.

II. WORKER/PUBLIC PROTECTION:

A. Workers, residents, and the public shall be made aware of the potential health hazards associated with contact or ingestion of recycled water, and should be educated about proper hygienic practices to protect themselves and their families.

B. Workers and others must be notified that recycled water is in use, through the posting of signs, etc.

C. The following measures should be taken to minimize contact with recycled water:

1. Workers/public should not be subjected to recycled water sprays.

2. Workers should be provided with the appropriate clothing during prolonged contact with recycled water.

D. Potable drinking water should be provided for workers.

E. Toilet and washing facilities should be provided.

F. Precautions should be taken to avoid contact with food and food should not be taken into areas that are still wet with recycled water.

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G. A first aid kit should be available on site, to prevent the contact of cuts and other injuries with recycled water.

III. GENERAL WATER REUSE PRACTICES:

A. All windblown spray and surface runoff of reclaimed water applied for water reuse practices onto property not owned or controlled by the Distributor or User shall be prevented.

B. Water reuse of recycled water shall be during periods of minimal human use of the service area. Consideration shall be given to allow an adequate dry-out time before the use area will be used by the public.

C. All drinking fountains located within the approved use area shall be protected by location and/or structure from contact with recycled water spray, mist, or runoff. Protection shall be by design, construction practice, or system operation. Facilities that may be used by the public, including but not limited to eating surfaces and playground equipment and located within the approved use areas, shall be protected to the maximum extent possible by siting and/or structure from contact by irrigation with recycled water spray, mist, or runoff. Protection shall be by design, construction practice or system operation.

TENTATIVE

SUPPLEMENTARY ENGINEERING REPORT FOR INDUSTRIAL RECYCLED WATER USER:

ROBERTSON'S READY MIX
2470 POMONA BLVD., POMONA, CA 91768

Prepared By:

City of Pomona

Utility Services Department

November 24, 2008

CITY OF POMONA
ROBERTSON'S READY MIX
SUPPLEMENTAL ENGINEERING REPORT

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APPENDICIES

Appendix A California Code of Regulations, Title 17 and Title 22 (Excerpts only)
Appendix B LACSD Recycled Water Permit (RWQCB Order No. 81-34 & 97-72)
Appendix C 2005 Los Angeles County Water Recycling Advisory Committee's Recycled Water User Guide
Appendix D Tables 1-4

ABBREVIATIONS

AFY	Acre-feet per year
CCR	California Code of Regulations
CWIRS	Countywide Integrated Radio System
DCS	Distributed Control System
DPH	Los Angeles County Department of Public Health
EPA	Environmental Protection Agency
LACSD	Los Angeles County Sanitation Districts
MLCSP	Mortar Lined and Coated Steel Pipe
NPDES	National Pollution Discharge Elimination System
RPPD	Reduced Pressure Principal Backflow Device
PWRP	Pomona Water Reclamation Plant
RWQCB	Regional Water Quality Control Board
SCE	Southern California Edison

SECTION 1 - INTRODUCTION

The City of Pomona (Pomona) will deliver tertiary treated effluent recycled water from the County Sanitation Districts of Los Angeles County's (Districts') Pomona Water Reclamation Plant (PWRP) to Robertson's Ready Mix (Robertson's) in Pomona. The service area is shown in **Figure 1** below:

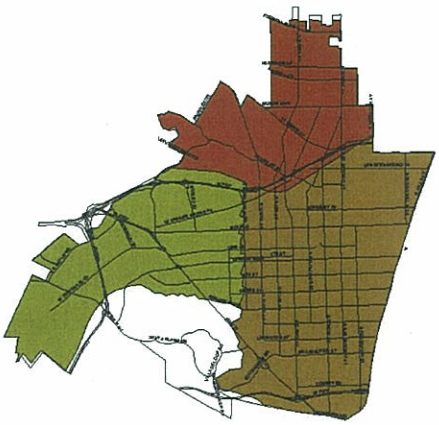


Figure 1- Pomona Service Area

This report documents the construction of recycled water facilities for Robertson's Ready Mix. **Figure 2** shows the location of Robertson's Ready Mix, where the project will occur.

1.1 ROBERTSON'S READY MIX

Robertson's is located at 2470 Pomona Blvd. in Pomona. The facility is a concrete mixing plant for commercial and industrial purposes. Although the facility currently has no recycled water on-site, Robertson's uses it at other plant locations as an element of concrete production. After the proposed recycled water improvements are installed, the facility will use recycled water for loading of concrete into the ready mix trucks and as an ingredient in concrete mixing. The expected usage is approximately 100 AFY (0.18 MGD). This report presents a description of Robertson's potable water and recycled water systems after connecting to the recycled water distribution system. It also presents the start-up procedures and conditions for recycled water use.

SECTION 2 - PROJECT

2.1 GENERAL

This section provides a general overview of the recycled water project. It presents the rules and regulations governing the project's recycled water use; describes the agencies involved from the producer to the customer; and describes the recycled water supply. The proposed project discussed in this report involves the new installation of one, new recycled water service, solely for concrete mixing and transport.

2.2 RULES AND REGULATIONS

The California and Los Angeles County regulatory requirements that apply to recycled water supply and facility installation include Title 17 and Title 22 of the California Code of Regulations (CCR). Pomona obtains recycled water from the Pomona Water Reclamation Plant (PWRP) which is located within the Pomona service area at 295 Humane Way, Pomona, CA 91767. This facility is owned and operated by the County Sanitation Districts of Los Angeles County (Districts) that has its Joint Administration Office at 1955 Workman Mill Road, Whittier, CA 90601. This facility, which began operation in 1966, is a tertiary treatment plant that currently discharges fully treated effluent into Pomona's recycled water distribution system. Any effluent that does not make it into Pomona's system is either sold by the Districts to another water purveyor, used at the Districts' PWRP or Spadra Landfill facilities, or is discharged into the south fork of the San Jose Creek. By utilizing the effluent from the PWRP for irrigation and other non-potable purposes, Pomona can more efficiently allocate its potable water and increase the reliability of water supplies in its service area. A list of applicable rules and regulations and their corresponding locations within this report is provided as follows:

- California Code of Regulations, Title 17 and Title 22 – Excerpts provided in Appendix A
- Districts' Water Reclamation Requirements (Regional Water Quality Control Board (RWQCB) Orders No. 81-34 and 97-072) – provided in Appendix B
- 2005 Los Angeles County Recycled Water Advisory Committee's User Manual provided in Appendix C

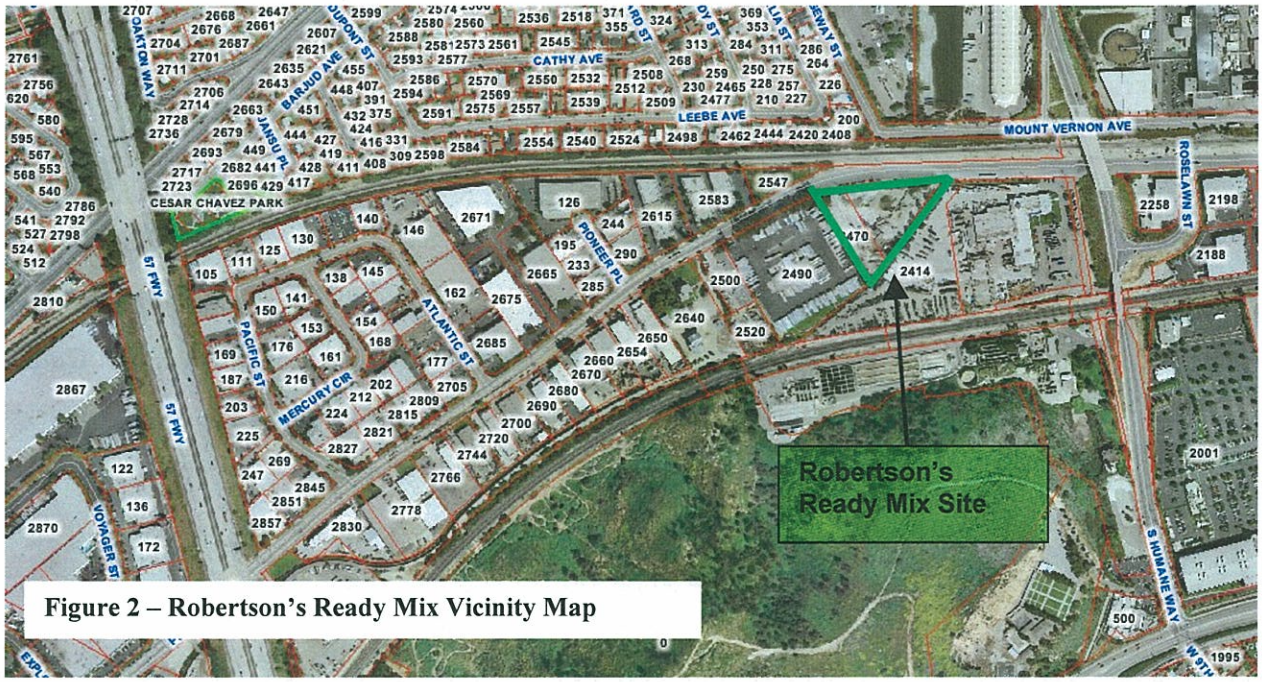


Figure 2 – Robertson's Ready Mix Vicinity Map

2.3 PRODUCTION AND CUSTOMER DELIVERY

There are several agencies involved with the production and delivery of recycled water at the Robertson's facility. This section describes each entity/agency and their specific role in the initial production of and final delivery of recycled water.

Producer/Purveyor

The Districts produce recycled water at the PWRP, which serves the City of Pomona recycled water system. As the reuse permit holder, the Districts are responsible for producing recycled water that meets Title 22 quality criteria, and for ensuring that recycled water is used at approved sites for approved applications.

Distributor/Service Provider

The City of Pomona is the recycled water distributor and service provider. Pomona sells recycled water and invoices its customers such as Robertson's. As the recycled water distributor, Pomona will be responsible for cross-connection inspection and tests, exclusive of backflow device testing. Pomona's site responsibility includes Robertson's recycled water meter and a minimal share of on-site cross connection inspection and tests, exclusive of backflow device

testing. However, Pomona is not responsible for on-site use.

Customer

Robertson's Ready Mix is the customer. The customer is responsible for constructing, owning, operating and maintaining all water conveyance systems and related appurtenances downstream of the meters. Pomona will perform annual visual inspections to determine compliance with applicable State regulations and guidelines related to recycled water. With Los the Angeles County Department of Public Health (DPH) as the lead, Pomona will assist during periodic cross-connection tests that will be conducted every four years. The customer remains responsible for the periodic testing of any and all backflow prevention devices.

2.4 RAW WASTEWATER AND INDUSTRIAL WASTE SOURCE CONTROL

The source of recycled water to be used for this project is the PWRP, located at 295 Humane Way, Pomona, CA 91763. As mentioned previously, the PWRP is owned and operated by the Districts, which have their Joint Administrative Office at 1955 Workman Mill Road, Whittier, CA 90601. The current design capacity of the PWRP is 13 MGD, with an average of 8.78 MGD being treated during calendar year 2007.

The average, maximum, and minimum concentrations of constituents analyzed in the raw wastewater treated at the PWRP (during calendar year 2007) are presented in **Table 1**[1]. The source of wastewater for the PWRP is primarily of domestic origin. Industrial wastewater flows represent approximately four to five percent of the total combined flow tributary to the PWRP. The types of businesses and approximate average daily wastewater flows to the PWRP are presented in **Table 2**[2]. (Domestic flows from hospitals are not included in this table although such facilities do maintain industrial wastewater discharge permits).

[1] See Appendix D for Table 1 data.
[2] See Appendix D for Table 2 data.

Source control of industrial waste for the PWRP is implemented through the Districts' Industrial Waste Pretreatment Program. The pretreatment program was established to; help the Districts' treatment plants to comply with effluent discharge requirements and help prevent pass through and interference, protect the public, the environment, and Districts' personnel and facilities from potentially harmful industrial wastes, and ensure that industrial users pay their fair share of treatment operations and maintenance costs. To achieve these objectives, in 1972 the Districts adopted the Wastewater Ordinance which provides the legal authority to enforce the Districts' local pretreatment requirements as well as all appropriate state and federal regulations. The success of the Districts' industrial waste pretreatment program can be attributed to rigorous up-front permitting and pretreatment requirements, intensive and extensive field presence by the Districts' inspection staff and monitoring crews, thorough investigation of treatment plant incidents caused by industries, and aggressive enforcement actions for all violations.

The Districts monitor industrial wastewater dischargers through three separate mechanisms. One mechanism consists of the collection of composite and grab samples by the Districts' monitoring crews. Another mechanism entails the collection of grab samples by the Districts' Industrial Waste Inspectors in conjunction with on-site inspections of industrial equipment and wastewater sources. In addition, as part of the self-monitoring program, many industrial dischargers are required to sample their own wastewater and report analytical results to the Districts. The Districts have also established a surveillance monitoring program aimed at facilitating the detection of actual and potential problems caused by illegal discharge of prohibited materials. Monitoring crewmembers work in the late night and morning hours to set up specialized sampling equipment in the public sewerage system at points upstream and downstream of industrial users suspected of illegal discharges.

To ensure the pretreatment program is consistent with current regulations, Districts' staff actively works to maintain updated information on categorical regulations, both existing and imminent. The Federal Register is reviewed regularly for updates and pertinent announcements, development documents are maintained and periodically reviewed, and Environmental Protection Agency (EPA) guidance manuals, memoranda, clarifying letters and other source material are maintained to aid in interpretation and implementation of regulations. Engineering

and inspection staffs are brought up to date in regards to new regulations whenever necessary. Communication between the Districts and EPA occurs regularly to ensure that regulations are correctly interpreted. The Districts review proposed industrial categorical regulations and submit comments to the EPA.

2.5 TREATMENT PROCESS

The PWRP provides tertiary treatment by utilizing the following treatment process sequence: primary sedimentation, activated sludge nitrification/denitrification biological treatment, secondary sedimentation, coagulation, inert media filtration, chlorination and dechlorination. All primary and waste activated sludge from the PWRP is returned to the sewer for transport to and further processing at the District's Joint Water Pollution Control Plant in Carson. A process schematic of the PWRP treatment process is included as **Figure 3**. Final effluent water quality for calendar year 2007 presented in **Table 3**[3], meets the criteria contained in Title 22.

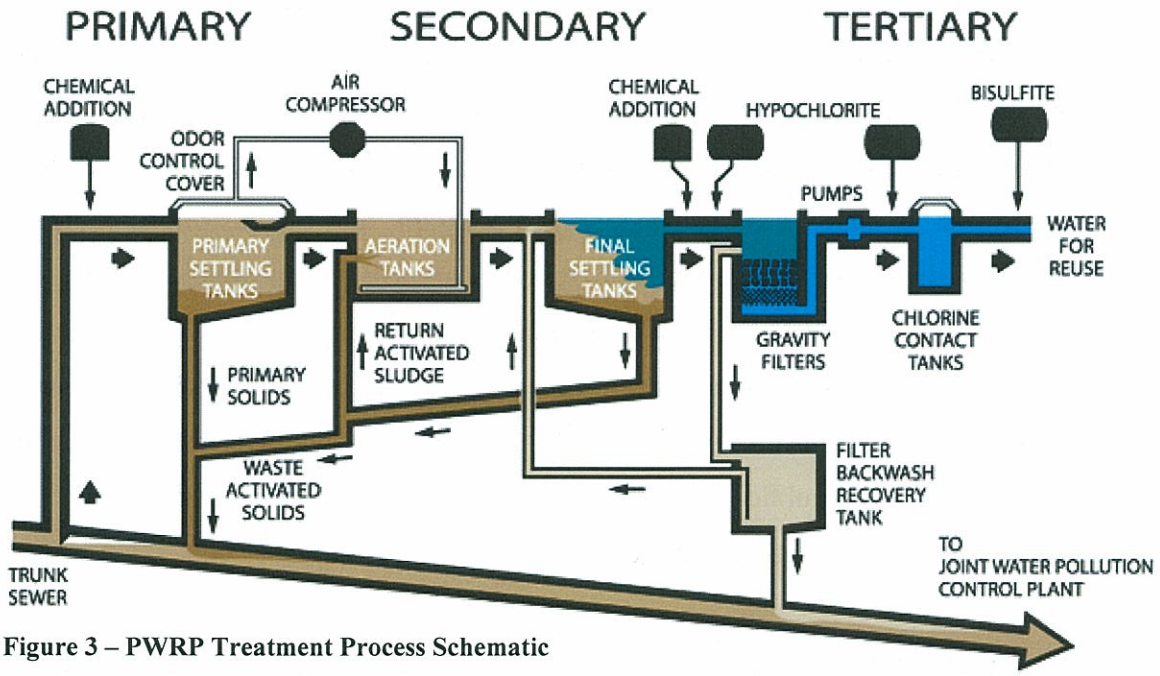


Figure 3 – PWRP Treatment Process Schematic

The average wastewater loading rates and process design data for the PWRP are presented in **Table 4**[4]. The chemical storage and handling facilities at the PWRP consist of chemical storage

[3] See Appendix D for Table 3 data.
[4] See Appendix D for Table 4 data.

tanks with secondary containment. Specific actions to prevent hazards from occurring are included in the Integrated Emergency Response Plan, located in the PWRP control room. A spill kit including the absorbent materials is also located in the control room with instructions for use with each chemical.

The Operation and Maintenance Manual (O&M Manual) for the PWRP is intended to instruct a trained operator in the operation and maintenance of the PWRP. The general organization of the chapters in the O&M Manual is by unit processes with a separate section for the operation and maintenance of the pump station. For example, primary sedimentation, aeration, secondary sedimentation, filtration, chlorination and dechlorination, and pump station operation and maintenance are chapter topics. The chapters that describe the unit processes are divided into subsections including: Purpose and Intent, Design, Operation, Indicating Lights and Alarms, and Operating Problems and Solutions. Piping schematics are provided to assist in describing the process or locating critical equipment. Other topics covered in the O&M Manual include sampling and laboratory analysis, safety, emergency operating conditions and response procedures, and personnel requirements. The O&M Manual is intended to supplement the various manufacturer's equipment instruction bulletins, and the construction plans and specifications, all of which are available at the PWRP. The O&M Manual is updated periodically to reflect changes in equipment and procedures.

2.6 PLANT RELIABILITY FEATURES

The Districts have completed the upgrade of the PWRP with a state-of-the-art Distributed Control System (DCS). The DCS allows all critical plant parameters to be monitored and most process equipment to be operated.

The PWRP is staffed for one shift, from 7:00 a.m. to 3:30 p.m. The DCS computers at the Districts' facilities that are not staffed 24-hours (such as the PWRP) are linked to the DCS computers at the nearest Districts' WRP that has a full-time staff of operators (in this case, San Jose Creek WRP East). The alarm system also automatically calls operators on a pre-set list until one of them responds. The DCS provides the Plant Supervisor and operators with the ability to view long-term trends, such as rising turbidity or decreasing oxygen levels, and

institute early corrective actions prior to reaching alarm conditions. Problems in the treatment process that are identified early can be corrected much more readily than if the conditions were allowed to degrade to the alarm point, at which time discharge violations are potentially more likely. Treatment facilities that are not staffed during the swing and graveyard shifts also have the advantage of operator oversight if an alarm is activated.

Treatment plant operators and other critical staff are also equipped with CWIRS (CountyWide Integrated Radio System) radios that enable them to communicate immediately from remote areas. This system proved itself during the 1994 Northridge earthquake when most other communication systems failed.

2.7 SUPPLEMENTAL WATER SUPPLY

No supplemental water supply is anticipated at the Robertson's Ready Mix site.

2.8 MONITORING AND REPORTING

The PWRP has a permit for water reuse, with 4.32 MGD being delivered during calendar year 2007 to 171 reuse sites served by the City of Pomona, the Walnut Valley Water District, and the Districts. The requirements for both water reclamation and for monitoring and reporting are listed below and are included as **Appendix B**:

1.The water reclamation requirements for the PWRP are contained in Board Order No. 81-34 adopted July 27, 1981 by the RWQCB. These requirements were re-adopted on May 12, 1997 in Board Order No. 97-072.

2.The monitoring and reporting requirements for the PWRP reuse permit are contained in Monitoring and Reporting Program No. 6844 issued July 27, 1981 by order of the Executive Officer of the RWQCB.

The effluent turbidity and total flow at the PWRP are monitored continuously using instrumentation that is calibrated weekly by PWRP staff. Other water quality monitoring is conducted in accordance with the permit at different frequencies (daily, weekly, monthly, etc.)

by collecting samples from specific locations (e.g., influent, effluent, etc.). All analyses are conducted at a laboratory certified by the State DPH's Environmental Laboratory Accreditation Program, or approved by the Executive Officer in accordance with current EPA procedures, or as specified in the monitoring program.

2.9 CONTINGENCY PLANS

The PWRP is staffed with operators certified by the State Water Resources Control Board, and are under the direction of a Plant Supervisor certified at Grade V. The Plant Supervisor reports to a Plant Superintendent also certified at Grade V, who can lend considerable operational experience during non-standard operating situations or emergencies. This extensive experience allows the PWRP to maintain a consistently high effluent quality during normal operation and allows for rapid, appropriate and effective responses to extraordinary or emergency situations that threaten effluent quality.

If conditions require the immediate diversion of treated effluent from the PWRP away from the reuse areas, the effluent will be discharged to the south fork of the San Jose Creek that eventually flows into the San Gabriel River. Such discharge is regulated by the plant's National Pollutant Discharge Elimination System (NPDES) permit No. CA0053619, RWQCB Order No. R4-2004-0099. No supplemental irrigation water supplies will be provided to the subject recycled water customers. Below is a discussion of the emergency standard procedures in place at the PWRP.

Maintaining Plant Operational Status

The PWRP has procedures in place for non-standard and emergency plant operational situations. Examples of incidents that affect treatment plant operation include discharges of incompatible industrial wastes, power failure, process equipment failure, excessive rainfall runoff, earthquake and fire. Most incidents that adversely impact the wastewater treatment process are minor, transitory and/or cause little or no degradation of effluent quality. Continuous real-time monitoring of influent pH alerts the plant operators to pH changes in the raw wastewater that could be caused by an incompatible industrial waste entering the plant. Continuous real-time monitoring of secondary, filter and final effluent turbidity warns the operators of an upset of the activated sludge process prior to the non-compliant effluent leaving the plant. The PWRP is also

equipped with partial backup power to ensure continuous operation of most of the treatment processes, even during catastrophic events.

A comprehensive alarm system immediately notifies the plant operators of any failure of process equipment or if any critical water quality parameter has exceeded its predetermined set-point. The PWRP is also equipped with a call-out alarm that notifies designated PWRP staff and the San Jose Creek WRP East during the hours the PWRP is not staffed. All warning systems allow for the early detection of a problem so that the cause can be investigated, possible corrective actions evaluated and remedial actions taken. The following is a standard initial response plan to a plant alarm that applies at all of the District's WRPs:

- Determine the cause and location of the alarm condition. All alarms are indicated by audible alarms and are displayed on the DCS screens. For these alarms, the operator checks the local control panels and the panels in the Control Building using the following procedure:

  1) The alarm is silenced by pushing the appropriate "ACKNOWLEDGE" button.

  2) If applicable, place standby equipment into operation.

  3) Determine the cause of the failure and correct it if possible. If the procedure required to correct the alarm condition is too extensive to be handled by the personnel on hand, the Plant Supervisor or Plant Superintendent must be notified so additional personnel required to correct the malfunction can be contacted or mobilized.

Specific responses to incidents that may result in discharge violations must be evaluated in light of the particular conditions of the event. The appropriate actions that will avoid and/or prevent the degradation of the final effluent would then be taken. Typically, degradation of water quality first manifests itself in the secondary treatment process; therefore, the plant operators have a couple of hours before effluent that does not meet the discharge criteria could possibly leave the plant. At the PWRP it will be a priority to shut down deliveries of off-specification water to the recycled water use sites.

Storm Flow Procedures

Of all potential incidents that could adversely affect effluent quality, storm flow is not only the most likely to occur, but also can be anticipated and prepared for using weather forecasts (unlike events such as earthquakes and fires, which are relatively rare and completely unpredictable). The official rainy season is from October 1 to April 1. The primary objectives during storm flows are to prevent sewer overflows (as a result of inflow via the sewer manhole covers) and to minimize negative effects on plant performance after the storm flow subsides. The PWRP has a hydraulic capacity that is approximately double the design capacity, allowing for much greater short-term (peak) plant flows.

During heavy storm flow, irrigation demand will likely be at a minimum and an operator shut-down of the recycled water delivery pumps, due to a degradation of water quality below reuse standards, generally would not cause any problems for the irrigation customers. Procedures for advance preparation, operation during storm flow conditions, and operation after storm flows are given below:

Advance Preparation for Storm Flows: Since storm flows depend upon the amount, intensity and location of rainfall, and the degree of soil saturation, it is not certain the plant will experience abnormally high peak flows during all rain events. However, preparation is necessary. The operator must stay aware of the weather forecast and call the Weather Service if significant rainfall is predicted.

The operator will verify all equipment is prepared and maintained for maximum loading or output. If minor repairs are required to put critical equipment back into service and there is sufficient time to complete them, the repairs are made

Operation During Storm Flow Conditions: The primary consideration during storm flow is to prevent an overflow in the sewerage system. A secondary but still essential consideration is to maintain adequate treatment to meet discharge requirements. The operator must pay specific

attention to the amount of plant flow, to operation of the filters, and to maintaining adequate disinfection. If any violations occur, or if there is the possibility of having a violation, plant operators are instructed to immediately notify the Plant Supervisor. Specific operating procedures are given below for the various systems.

- Primary Sedimentation: Verify enough primary tanks are in service, and check the wastewater level in Channel No. 1.

- Aeration System and Activated Sludge Process:

  1) Verify that there are enough step feed gates open to handle the plant flow. If more gates are needed, open an additional gate.

  2) As the plant flow increases above normal, increase the return sludge flow to maintain the normal ratio between return sludge and plant flows.

  3) Increase the air flow to the aeration tanks as required to maintain an acceptable dissolved oxygen level (a higher dissolved oxygen level is required to compensate for the reduced detention time; however, storm flows are weaker in organic matter).

- Effluent Filters:

  1) If it appears that plant flow will be extremely high, put every operable effluent filter into service and open the effluent valves 100 percent when needed.

  2) Start up the Cationic Polymer Feeding System and inject polymer at the aeration tanks' outlet gates. Use only enough polymer to keep the secondary effluent turbidity down to an acceptable level.

3) If the filter effluent turbidity rises above 3.0 NTU, do not increase the alum dose during storm flow conditions. Caution is used because an increase in alum dosage will increase the head loss through the filters and will decrease the filters' capacity, possibly resulting in a filter bypass condition.

4) When plant flows approach hydraulic capacity, keep a close watch on the water depth at the emergency bypass structure. A high water alarm will sound prior to a partial filter bypass.

- Disinfection:

1) Start-up an additional sodium hypochlorite system if necessary. Always maintain adequate disinfection.

2) Filter bypasses at the PWRP are directed back to the sewer.

Post Storm Flow Procedures:

- Check the condition of plant grounds, roads, and structures for settling, cracks, and leakage. Defects are reported to Plant Supervisor.

- Check all electrical vaults and pull-boxes for water accumulation and use a siphon to drain them. Findings are reported to Plant Supervisor.

Power Failure

The loss of electrical power to the PWRP for an extended period of time can have serious, adverse impacts on plant operation and subsequent effluent quality. Once raw sewage enters the tertiary treatment plants, it flows by gravity through almost all of the treatment processes, eliminating the need for pumping. However, electrical power is required for the backwash

pumps, the chlorination equipment, the return sludge pumps, and, most important, the process air compressors (PACs) serving the secondary biological treatment process. The PWRP has a preferred and emergency preferred backup power supply connection from SCE to enable the plant to continue operation until normal power in the SCE system has been restored. During a plant power outage, delivery of recycled water, whether it meets reclamation criteria or not, is automatically interrupted. The pump station will not be restarted following restoration of plant power unless the recycled water meets reclamation requirements.

The following are general procedures that are followed by the operators at the PWRP in the event of power failure to the entire plant.

- Call Southern California Edison (SCE) to inform them of the power failure and to find out how long the interruption of service will last. Phones that do not require electrical power to operate are available for this purpose.

- Notify Plant Supervisor and/or Plant Superintendent.

- Shut off the breakers at the appropriate control panel. If these breakers are not shut off, a power surge during resumption of service may damage the instruments.

If SCE says that the power interruption will last more than 10 minutes, start the standby generator. In the unlikely event the standby generator will not start after many repeated attempts, notify the Plant Supervisor. Another portable generator will be brought in from another location.

- As soon as power is restored, do the following:

  1) Reset the Control Building breaker if it has been tripped.

  2) Turn on the breakers at the appropriate Control Panel.

3) Make sure one of the instrument air compressors is running.

4) If the plant is using SCE's power, start the process air compressors.

5) Take the appropriate steps to restart the Chlorination and Dechlorination Systems.

- After the vital plant systems have been put into operation, the operator conducts plant rounds and performs the following:

1) Check every pump and motor.

2) Make sure all samplers and turbidity meters are turned on.

3) Check all electrical panels and make sure all breakers are in proper positions.

The following are general procedures that are followed by operators at the PWRP in the event of power loss to any individual piece of equipment in the plant.

- Notify the Plant Supervisor.

- If appropriate, throw the circuit breaker to the faulty piece of equipment to the "OFF" position. This is not always done, as newer types of equipment (e.g., process air compressors, variable speed drives) have built-in diagnostics, and turning power off will reset the card and prevent the diagnostic function from being performed. Such equipment is readily distinguishable from equipment that is not equipped with diagnostics.

- Notify the Districts' electricians of the malfunction.

- Under no circumstances should any of the plant operators attempt to repair an electrical failure within the plant unless the repair only consists of resetting the breaker and pushing the "RESET" buttons.

- Inform the arriving electrician of any events that could have possibly led to the failure.

Earthquake

During an earthquake, the primary concern of an operator should be to protect him or herself from injury. Once the quake has subsided, there are certain procedures that are followed. These consist of checking the plant for damage and restarting equipment where necessary. The following actions are taken.

- Account for all personnel.

- Check all structures, buildings, tanks, galleries, etc., for cracks or any other type of structural damage.

- Check all machinery for damage or realignment that could have occurred during the quake. Especially check the mountings of all heavy machinery (e.g., process air compressors, influent pumps, sludge pumps, etc.) for cracks and broken bolts that could allow the equipment to shift or break loose during normal operation.

- After the equipment and structures have been visibly checked and appear to be undamaged, restart any equipment shut down due to the quake.

- The chlorination and dechlorination facilities should be checked very closely for any leaks that could have occurred during the quake.

- Check all plant piping for leaks and damage.

- Contact the Plant Superintendent within 15 minutes for a status report.

Following completion of these emergency procedures, the plant operators can then evaluate water quality to determine if the recycled water meets reuse requirements. Recycled water deliveries are not resumed until the effluent quality meets the reclamation criteria.

Fire

In the event of a fire, the operator on duty assesses the severity and type (e.g., electrical, chemical, etc.) of fire. The local fire department is then notified immediately. Fire fighting equipment, good for any type of fire, has been provided throughout the plant for use in extinguishing fires or preventing the spread of fires. In the event plant personnel cannot extinguish a fire, the following general procedures are followed to prevent further spread of the fire and damage to the equipment.

- Notify the Fire Department at 911 and the Plant Supervisor as soon as possible.
- Remove any combustible material from the vicinity of the fire.
- If the fire is electrical in nature, shut off the appropriate circuit breaker.
- Hose down nearby structures.
- Remove any equipment that can be moved from the area.

Following completion of these emergency procedures, the plant operator(s) can then evaluate water quality to determine if the recycled water meets reuse requirements. Recycled water deliveries are not to resume until the effluent quality meets the reclamation criteria. Detailed procedures including outside agency notification are included in the Integrated Emergency Response Plan, located in the PWRP control room.

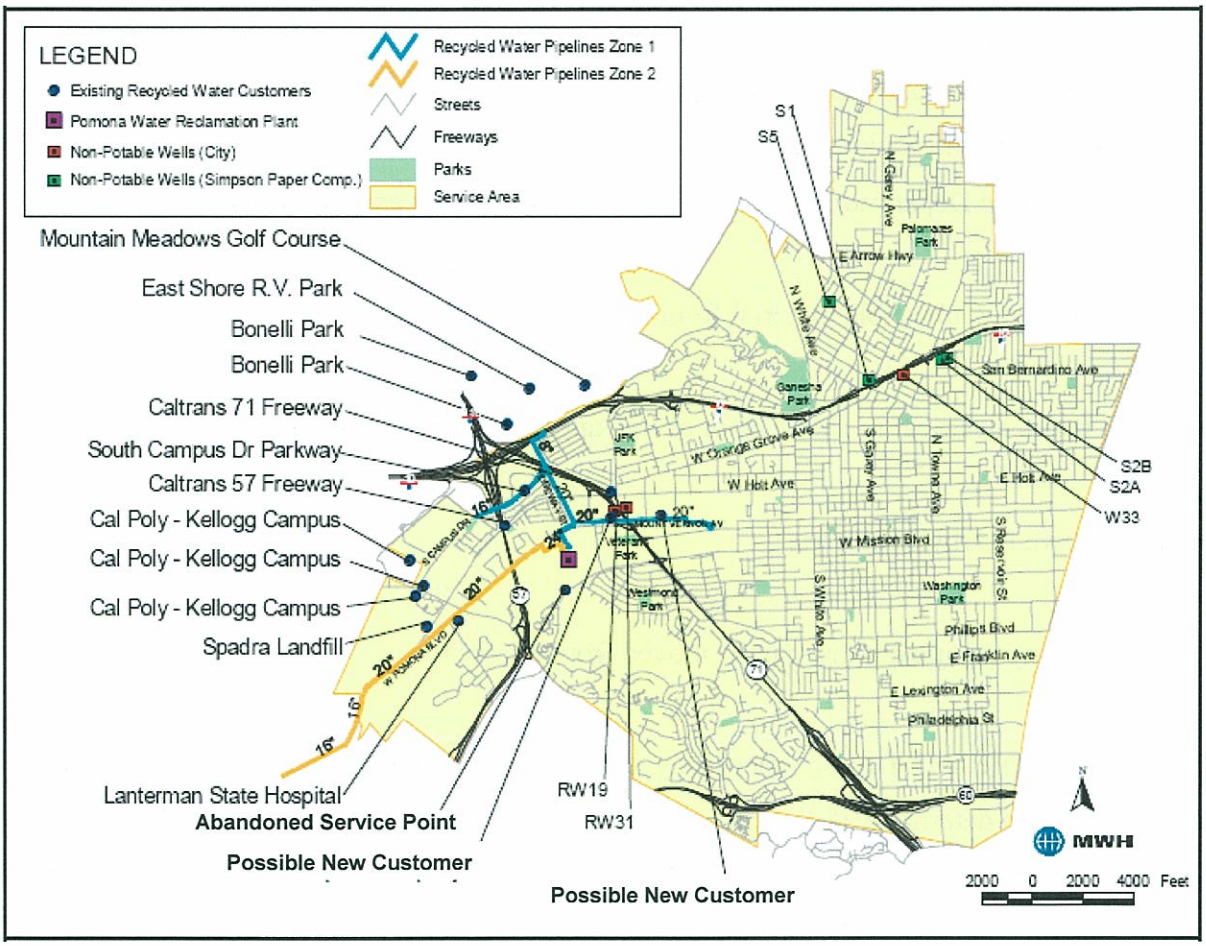
SECTION 3 – TRANSMISSION AND DISTRIBUTION SYSTEMS

3.1 CITY OF POMONA RECYCLED WATER DISTRIBUTION SYSTEM

The City of Pomona currently distributes recycled water in various locations citywide. Pomona receives recycled water from the Districts' PWRP. The existing recycled water distribution system is shown on **Figure 4**.

Source: May 2005, City of Pomona "Water and Recycled Water Master Plan"

Figure 4
Recycled Water System and Original Customer Locations



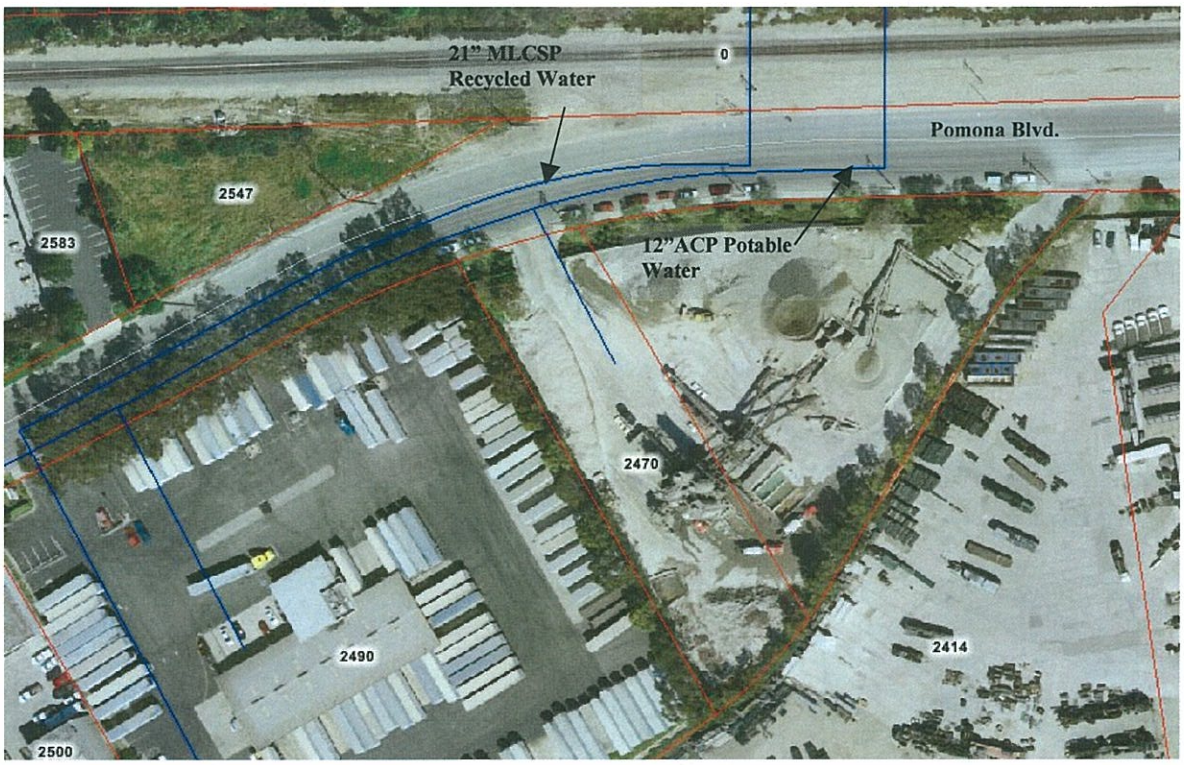
3.2 OFF-SITE RECYCLED WATER DISTRIBUTION FACILITIES

Recycled water from the PWRP will be delivered to the Robertson's plant via an existing 21-inch diameter mortar-lined and coated steel pipe (MLCSP) pressurized recycled water main. The water main location is directly fronting the northern boundary, along Pomona Boulevard, as depicted in **Figure 5**. The proposed 4-inch recycled water meter assembly will serve a 4-inch recycled water line that will serve the site (see **Figure 6).**

3.3 OFF-SITE POTABLE WATER DISTRIBUTION FACILITIES

Pomona also provides potable water service for both domestic uses as well as for fire suppression. The site is supplied through one existing 4-inch domestic water meter located on Pomona Boulevard for potable use and fire suppression, as shown in **Figure 4.** An existing reduced pressure principal backflow device (RPPD) is installed after the 4-inch meter.

Figure 5 – Existing Potable and Recycled Water Supply



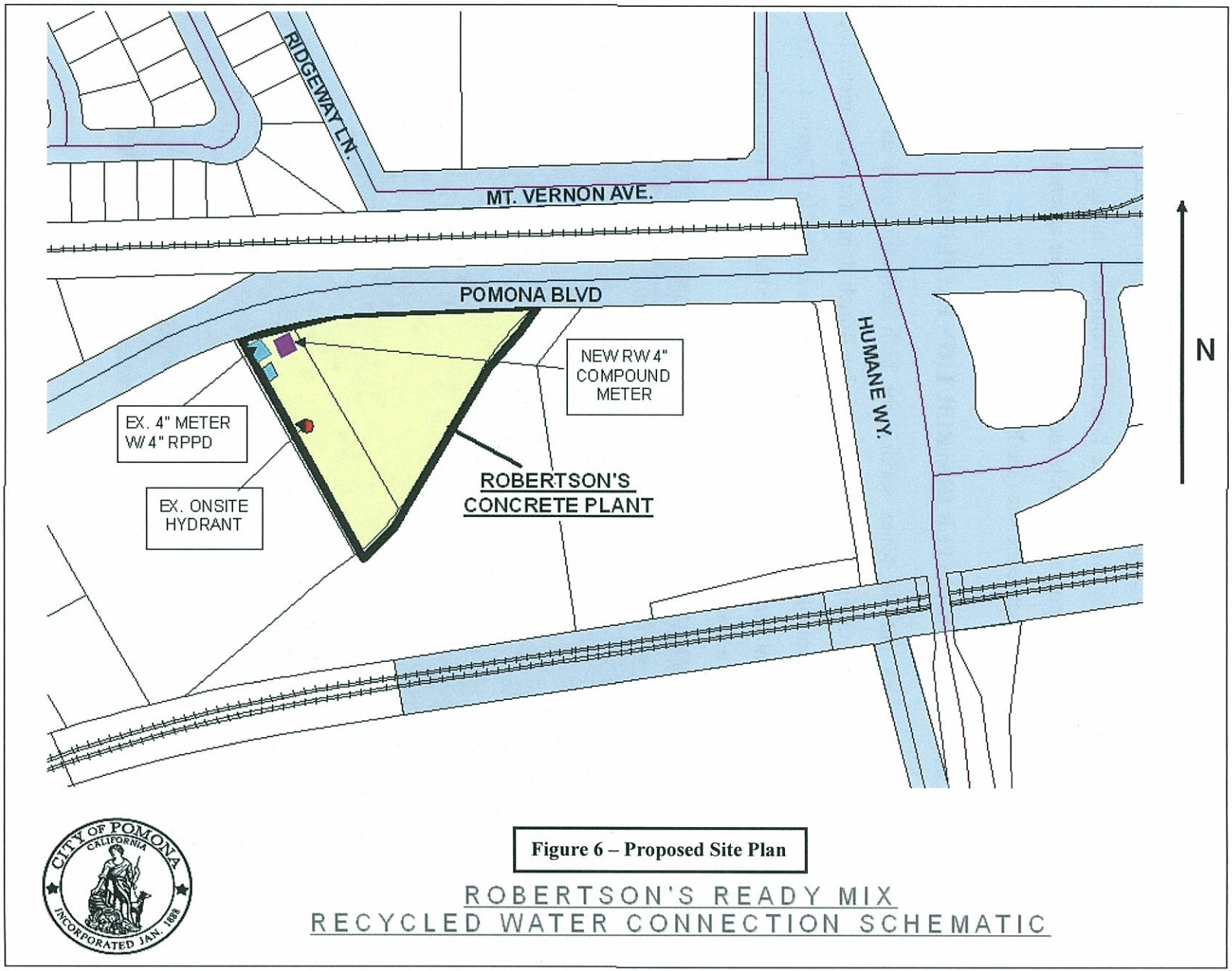


Figure 6 – Proposed Site Plan

SECTION 4 – USE AREA DESIGN

The Robertson's Ready Mix facility is located on a three-acre site. The buildings include an administrative office building, a concrete materials storage/loading area, a concrete generation and a concrete hopper area. Recycled water will be utilized in the concrete hopper, loading, and generation area. All bathroom facilities and fire protection systems will remain being served by the existing potable water system. **Figures 5 and 6** show the site plan and how the on-site recycled water system will be connected to the existing 21-inch recycled water distribution main. **Figure 6** shows the recycled water connection detail to the new 4-inch recycled water meter. **Figure 6** shows the full site plan of the Robertson's building and the layouts of the potable, industrial, fire protection and recycled water piping systems after connection to recycled water.

4.1 EXISTING FACILITIES

Currently all water served to the facility is potable water from Pomona via one four-inch (4") meter on Pomona Blvd. A 4-inch RPPD protects the potable service. There is one onsite fire hydrant for fire protection. The fire system is served via the potable distribution system. From the 4-inch meter, the potable water line runs south to the onsite buildings, where it currently serves all domestic and industrial processes/purposes.

4.2 PROPOSED FACILITIES

As shown in **Figures 5** and **6**, a new 4-inch recycled water line will be constructed from the new recycled water meter on the northwestern side of the facility. The line will run south towards the concrete mixing, loading and storage area. A portion of an existing 4-inch onsite main will be used before the potable and recycled systems separation. These proposed uses are discussed further in subsequent sections.

4.3 CROSS CONNECTION CONTROL AND BACKFLOW PREVENTION

The on-site recycled water system will be installed in accordance with the state of California DPH guidelines (see **Appendix A**). An approved RPPD will be installed on the potable line immediately downstream of the City meter on Pomona Blvd., in accordance with Title 17 of the CCR (see **Figure 5**). New recycled water piping will be installed in satisfaction of optimal

separation (10 feet horizontal, 1-foot vertical) from other on-site water lines. No interconnection between the on-site potable water or fire suppression systems and the on-site recycled water system is permitted at the facility under any circumstances.

4.4 IDENTIFICATION

All on-site recycled water piping will be identified to clearly differentiate it from on-site potable and fire suppression water piping. Such identification entails wrapping recycled water piping with purple mylar warning tape. Signs will be posted near all concrete loading, mixing and storage areas. These signs will be at least four inches high by eight inches wide, include the wording **"RECYCLED WATER – DO NOT DRINK"** in English and Spanish and display the international **"do not drink"** symbol.

Source: 2005, Los Angeles County Recycled Water Advisory Committee "Recycled Water User Manual"

4.5 USE AREA INSPECTION AND MONITORING

4.5.1 Construction Inspection and Monitoring

The Los Angeles County DPH, in accordance with Titles 17 and 22 of the CCR and Los Angeles County guidelines, will conduct construction inspection and start-up testing.

4.5.2 Ongoing Inspection and Monitoring

Ongoing inspection and testing will be conducted in accordance with Titles 17 and 22 of the CCR. Pomona will verify the above referenced signs have been installed and tamper-detect valve seals placed at initial start-up of the recycled water service, and during subsequent inspections. This facility will undergo cross-connection testing with procedure and frequency as established in Titles 17 and 22 of the CCR. In addition to detailed cross-connection control testing, Pomona will perform an annual inspection.

Any cross-connection or backflow incident involving potable water will be reported to state and county health agencies. Any non-compliance with RWQCB Order No. 81-34 will be reported to the Districts, as well as to the State DPH and County DPH. The following notification contacts are current as of August 2008:

State of California Department of Public Health	**Chi Diep**	(213) 580-5723
Los Angeles Regional Water Quality Board	**Mazhar Ali** (213-576-6652) **Rosario Aston** (213-576-6653)	320 West Fourth Street, Suite 200 Los Angeles, CA 90013 Phone: (213) 576-6600, Fax: (213) 576-6640
Los Angeles County Department of Public Health	**Paul Wong** or **Dan Bacani**	(626) 430-5295
City of Pomona	**Tom Baca** – Testing **Chris Brown** – Operations	(909) 802-7425 (909) 620-2254

4.6 TRAINING

A training session will be conducted by Pomona for the Robertson's Ready Mix On-Site Supervisor on the approved and appropriate uses, guidelines, and stipulations regarding the operation of the on-site recycled water system. After training, the On-Site Supervisor will be responsible for maintaining strict control of the on-site recycled water system and conducting follow-up education/training sessions. Robertson's Ready Mix will sign the Districts' "Conditions for the Introduction and Use of Recycled Water" to verify understanding of the use requirements.

California Regional Water Quality Control Board
Los Angeles Region

320 W. 4th Street, Suite 200, Los Angeles, California 90013
Phone (213) 576-6600 FAX (213) 576-6640 - Internet Address: http://www.waterboards.ca.gov/losangeles

Linda S. Adams
Cal/EPA Secretary

Arnold Schwarzenegger
Governor

March 26, 2009

Mr. Raymond Tremblay
Section Head, Monitoring
County Sanitation Districts of Los Angeles County
P.O. Box 4998
Whittier, CA 90607-4998

Dear Mr. Tremblay:

PROPOSED EXTENSION OF WATER RECYCLING SERVICE AREA – COUNTY SANITATION DISTRICTS OF LOS ANGELES COUNTY, POMONA WATER RECLAMATION PLANT (Order No. 81-34, CI NO. 6241)

We reviewed your transmittal letter dated December 5, 2008, and the Engineering Report prepared by the City of Pomona, dated December 3, 2008, which requests approval for the extension of the recycled water distribution system. The report describes that:

1. The City of Pomona proposes to extend the existing recycled water pipeline by installing a lateral line extending from Pomona Boulevard, heading southeast, towards Robertson's Ready Mix;

2. Recycled water distributed through the extended pipeline would deliver up to 0.18 million gallons per day (MGD) of tertiary-treated recycled water from the Pomona WRP to be used for industrial purposes (mixing concrete and dust control) at Robertson's Ready Mix;

3. The project is expected to begin operation as soon as the Executive Officer approves the recycled water line extension; and,

4. The report was prepared in accordance with the California Department of Public Health (CDPH) Guidelines and in accordance with California Code of Regulations, Title 22 Sections 60301 through 60355.

The Joint Outfall System, formerly referred to as County Sanitation District of Los Angeles County (CSDLAC), may recycle tertiary-treated water from the Pomona WRP, under Order No. 81-34, adopted by the Board on July 27, 1981, and re-adopted without change on May 12, 1997. Section B of that Order contains specifications for the use of recycled water as industrial process water for paper pulp processing, metal finishing, industrial cooling, and soil compaction and dust control. Provision D.8 of the Order requires that the Reclaimer submit a report to the Regional Board for Executive Officer approval, when proposing an extension of the recycled water system. In addition, Provision D.8 requires that following construction, as-built drawings be submitted to the Executive Officer for approval, prior to use of reclaimed water.

On January 27, 2009, Regional Board staff contacted Earle Hartling, of your staff and Nichole Horton of the City of Pomona, to obtain additional information on the project, specifically requesting the as-built drawing for the recycled water line. On March 23, 2009, we received the as-built drawing for the recycled water line. Based on the information received, we approve your engineering report for the aforementioned water recycling project. You are authorized to commence recycling water, as discussed in your engineering report, provided CDPH has no objections.

If you have any questions, please contact Rebecca Christmann at (213) 576-6756 or Veronica Cuevas at (213) 576-6662.

Sincerely,

Tracy J. Egoscue
Executive Officer

cc: Mr. Paul Williams, California Department of Public Health
Ms. Nichole Horton, City of Pomona
Mr. Earle Hartling, County Sanitation District of Los Angeles County

05-28-09 Draft

ORDINANCE NO.

AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF POMONA AMENDING CHAPTER 62 OF THE POMONA CODE OF ORDINANCES BY ADDING ARTICLE VII ESTABLISHING THE CITYWIDE RECYCLED WATER USE ORDINANCE FOR THE CITY OF POMONA, CALIFORNIA; ENACTING THIS ORDINANCE PROVIDING FOR THE REPEAL OF CERTAIN ORDINANCES NOT INCLUDED THEREIN;

WHEREAS, the City of Pomona, its residents and businesses will benefit from local requirements, standards and usage of recycled water infrastructure and services;

WHEREAS, the purpose of this Ordinance is to require the use of recycled water where practical and appropriate; and

WHEREAS, the purpose of the Ordinance is to establish a city-wide policy concerning the connection to and usage of existing or proposed recycled water infrastructure immediately adjacent to respective properties; and

WHEREAS, the adoption of this ordinance is in tandem with the Citywide Water Conservation ordinance and is a potable water saving mechanism for the City of Pomona, as expressed herein.

WHEREAS, the proposed ordinance is consistent with and would further the goals and objectives of the City's 2009 Recycled Water Master Plan as approved by the City Council on ……2009. Which consists of infrastructure facilities….to delivery tertiary treated water.

NOW, THEREFORE, BE IT ORDAINED by the City Council of the City of Pomona as follows:

SECTION 1. That Chapter 62 of the Pomona Code of Ordinances is hereby amended by the addition of Article VII and shall read as follows:

ARTICLE VII. RECYCLED WATER USE

DIVISION 1. GENERAL

Sec. 62-880 Purpose

The purpose and intent of this article is, consistent with applicable laws, to:

a. Establish a citywide local policy regulating connection(s) to the existing or future recycled water system;

b. Establish clear citywide local requirements and standards for greater use of recycled water in lieu of potable water;
c. Use of recycled water for irrigation, dust control, manufacturing processes, and any other uses as defined in the current City of Pomona recycled water permit, the State of California Recycled Water Policy and General Use Permit;
d. Assure all residents and business owners citywide availability of recycled water infrastructure within ½ a mile of their location;
e. Assure cooperation from City staff with regard to the recycled water connection process and applicable fees;
f. Enable the City to conserve potable water for uses other than irrigation, dust control, and manufacturing processes; and
g. Eliminate potable water losses as much as possible.

Sec. 62-881 Penalty

Sec. 62-882 Scope

a. This division shall apply to all persons, customers, and property served by the City of Pomona Utility Services Department.
b. This division shall not apply to any hospital, health care or convalescent facility or any type of facility where the health and welfare would be affected by required recycled water use. However, this division does apply to outdoor grounds, yard and parking areas of these facilities.

Sec. 62-883 Authorization

The Utility Services Division manager is hereby authorized to implement this division.

Sec. 62-884 Mandatory Recycled Water Connection

The Utility Services Division shall assess the existing and recycled water infrastructure adjacent to its customers on a semi-annual basis. The Utility Services Division manager shall determine and notify adjacent customers within the extents to which the recycled water infrastructure may be connected to when practical. At the time of customer notification, it will be the customer's responsibility to assess which of their services may utilize recycled water connections.

SECTION 2. If any section, subsection, sentence, clause, or phrase of this article shall for any reason be invalid, such holding or holdings shall not affect the validity of the remaining portions of this article. The City Council has declared that it would have passed this article and each section, subsection, sentence, clause or phrase thereof, irrespective of the fact that any one

or more sections, subsections, sentences, clauses or phrases thereof be declared invalid.

SECTION 3. The City Clerk shall certify to the passage and adoption of this Ordinance, and shall cause same to be posted as required by law, and this Ordinance shall take effect thirty (30) days after the date of its final adoption.

PASSED AND ADOPTED THIS ____ DAY OF _____ 2009.

ATTEST: **CITY OF POMONA:**

_____ _____

Marie Michel Macias, City Clerk Elliot Rothman, Mayor

APPROVED AS TO FORM:

_____

Arnold Alvarez-Glasman, City Attorney

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STATE OF CALIFORNIA
COUNTY OF LOS ANGELES
CITY OF POMONA

I, MARIE MICHEL MACIAS, CITY CLERK of the City of Pomona do hereby certify that the foregoing Ordinance was introduced at a regular meeting of the City Council of the City of Pomona held on the ____ day of _____ 200X and adopted on the _____ day of _____, 200X by the following vote:

AYES: COUNCILMEMBERS:
NOES: COUNCILMEMBERS:
ABSENT: COUNCILMEMBERS:
ABSTAIN: COUNCILMEMBERS:

_____

Marie Michel Macias, City Clerk

Appendix G

CONDITION ASSESSMENT DETAILS

This Appendix includes descriptions of condition assessment criteria and sample field sheets from the assessment.

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CONDITION ASSESSMENT DETAILS

1.1. Introduction

The following sections describe each of condition assessment criterions, which are then used in Chapter 7 as the basis for evaluating the most cost-effective means of maintaining the City's existing recycled water system and prioritizing potential rehabilitation and replacement (R&R) projects.

1.2. Asset Condition Ranking

The ranking scale used in the condition assessment of each asset is shown in Table G.1. Each asset was assigned a condition value based on the percentage of the value of the asset that was required to return each asset to essentially new condition (i.e., restored to original physical condition, useful life, etc.). This scale is an internationally accepted, industry-wide standard for designating asset condition. The condition ranking is related to the percentage of the value of an asset needed to repair/rehabilitate the asset to return it to its original condition. In the case where an asset was not accessible or was non-existent in the field, a ranking of 0 was assigned.

Table G.1 Asset Condition Ranking Scale[1][2]
Recycled Water Master Plan
City of Pomona

Ranking	Description	Percentage of Asset Requiring Repair[2]
0	Non-Existent/Not Assessed	N/A
1	Very Good Condition	0%
2	Minor Defects	5%
3	Maintenance Required to Return to Accepted Level of Service	10 to 20%
4	Requires Rehabilitation	20 to 40%
5	Asset Unserviceable	>50%

Notes:

(1) Adapted from the International Infrastructure Management Manual.

(2) "Percentage of asset requiring repair" is that percentage of the value of the asset needed to return the asset to a condition ranking of 1.

The repair percentages associated with each condition ranking are used to calculate the evaluated remaining useful life, evaluated value, and the necessary repair/rehabilitation costs to return the component to its original condition.

Each major asset was divided into three disciplines (as appropriate) and each discipline was assessed individually. The three disciplines were:

1. Mechanical/Electrical/Instrumentation/Piping.

2. Structural/Architectural.

3. Civil/Site Work.

Members of the field condition assessment team separately assigned a condition ranking for each discipline. The discipline-specific condition rankings were then compiled into the one overall component condition ranking based on a cost-weighted basis.

1.3. Level of Service

Level of Service (LOS) defines the target condition value desired for each asset. The ranking scale used to assign a LOS to each asset is the same as the condition scale shown in Table G.1. Ideally, all assets would be a Condition/LOS of 1. Realistically, it is uneconomical to maintain all City assets at a condition ranking of 1. Each asset was assigned a target LOS value of 2 (equivalent to an asset condition of 2; good condition). Although there are no specific reliability goals associated with the LOS rankings, an LOS value of 2 is considered reasonable for the City to meet its goals for recycled water distribution.

The condition assessment was used to quantify any differences between the baseline LOS value and the current condition of each asset. If the current condition of the asset does not meet the designated target LOS value, repairs will need to be made to improve the asset condition to meet the LOS goal. However, LOS goals for the assets can be modified based on the City's knowledge of the operations goals and maintenance history of individual assets. For example, if an asset will be replaced in the near future, the City may decide to decrease the LOS value for the existing asset. This would allow the condition of the existing asset to decrease slightly before it is replaced with a new asset, while preventing the expenditure of funds needed to maintain the existing asset in good condition (to meet the assigned LOS goal of 2). LOS is used to develop the repair costs.

1.4. Original and Remaining Useful Life

Original Useful Life is the number of years an asset is expected to be in service as a function of asset type (i.e., mechanical, structural, electrical, instrumentation and control) and Remaining Useful Life is the original useful life less the number of years an asset has been in service. Original useful life is used to develop the evaluated remaining useful life and economic remaining useful life. The original useful life values for different types of assets are presented in Table G.2.

Table G.2 Original Useful Life per Asset Type Recycled Water Master Plan City of Pomona	
Asset Type	**Original Useful Life**
Mechanical	20 years
Structural	50 years
Electrical	30 years
Instrumentation	15 years

1.5. Evaluated Remaining Useful Life

Evaluated Remaining Useful Life (ERUL) is based on the current condition of the asset and is the estimated remaining number of years until the physical failure of the asset. ERUL is often used in conjunction with Remaining Useful Life to better understand project needs. ERUL differs from remaining useful life because it incorporates the asset condition ranking. For example, the original useful life for structural components is listed as 50 years. If that asset is 49 years old, the remaining useful life will be only 1 year. However, in reality, if that asset is still in excellent condition, the “true” remaining life will be much more than 1 year.

ERUL is one method used to take into account the existing condition and ongoing maintenance work on the asset.

1.6. Economic Remaining Useful Life

The economic remaining useful life of an asset is the estimated period between the date of the condition assessment and the time when the asset degrades to a condition where repairing the asset ceases to be cost effective. It is important to keep in mind that the economic remaining useful life is only an estimate of the feasible operating period of an asset. Factors such as the operating environment, maintenance schedule, and other extraneous variables will influence the actual economic remaining useful life. For example, the economic remaining useful life of a newly purchased pump is equal to 20 years; however, the economic remaining useful life may continue to be 20 years, even several years after purchase if the pump is well maintained and run under low-stress conditions. Ultimately, if the pump continues to be well maintained, it may be feasible to run it for more than 20 years.

1.7. Replacement Value

For this project, replacement value is defined as the cost to replace the asset with a similar piece of equipment in April 2009 dollars.

Replacement costs were developed for each of the key assets based on Carollo's experience with infrastructure costs at similar facilities. Ultimate project costs at the time of construction are dependent on actual labor and material costs, actual site conditions, competitive market conditions, final project scope, final project schedule, and other factors. Because of these factors, funding needs must be carefully reviewed prior to making specific financial decisions or establishing final budgets.

The level of accuracy for construction cost estimates varies depending on the level of detail to which the project has been defined. Feasibility studies and master plans represent the lowest level of accuracy, while pre-bid estimates (based on detailed plans and specifications) represent a higher level. The American Association of Cost Engineers has developed the following guidelines for developing project cost estimates.

Table G.3 Project Cost Estimate Guidelines
Recycled Water Master Plan
City of Pomona

Type of Estimate	Anticipated Accuracy
Order-of-Magnitude (Master Plans)	+50% to -30%
Budget Estimate (Pre-design Report)	+30% to -15%
Budget Estimate (Final Design)	+15% to -5%

The opinions of cost presented in this report should be considered order-of-magnitude estimates, with an anticipated level of accuracy of +50 to -30 percent. The cost opinions for each of the listed assets represent April 2009 dollars consistent with the Los Angeles Engineering News-Record (ENR) value 9974.

1.8. Repair Costs

Repair costs are defined as the cost required to return an asset to a specified level of service, in this case a LOS of 2. Repair costs are as a percentage of the replacement cost based on the assessed condition. In the case of assets with a condition of 5, repair costs are equivalent to replacement costs. It should be noted that the developed repair costs represent relative numbers useful for prioritizing R&R projects. These costs are not intended to directly correlate to potential alternatives related to each asset. In some cases, it may be more practical not to repair specific assets, but rather to replace them when their various remaining useful lives expire. For these reasons, the repair costs identified herein for each asset should be revisited prior to implementing repair projects.

Facility / System Condition Assessment Form

Facility / System: Pomona Recycled Water System

Process / Basin / Zone: PWRP Pump Station

Component / Subbasin / Subzone: Small Booster C

Discipline: Mechanical / Electrical / Instrumentation / Piping

Current Year

Current ENR

Main Tab

Level of Service *	1	2	3	4	5	0			
Criticality									
Public Health & Safety	Multiple		Single		Seasonal		No Effect		
Environmental	Major			Minor			No Effect		
Cost of Repair	>$20			$5-$20			<$5		
Effect on Customers	Major			Minor			No Effect		
Vulnerability	1	2	3	5	10	20	50	100	150
Condition *	1	2	3	4	5	0			

Annual Maintenance Cost

Installation Year

Original Useful Life

Date of Inspection

Assessed By

Photo #

Acquisition Cost

Replacement Value

Salvage Value

Component Information Tab

ID Number

Manufacturer/Model (nameplate info)

Comments

Mechanical

Excessive vibration?	Yes	No	N/A
Excessive noise?	Yes	No	N/A
Excessive corrosion?	Yes	No	N/A
Excessive leaks?	Yes	No	N/A
Running hot?	Yes	No	N/A
Capable of running when inspected?	Yes	No	N/A
Support equipment functional?	Yes	No	N/A
Equipment or parts missing?	Yes	No	N/A
Parts for maintenance available?	Yes	No	N/A
Adequate for intended service?	Yes	No	N/A
Motor amps within rating?	Yes	No	N/A

Instrumentation

All critical indications functioning?	Yes	No	N/A
Alarms functional?	Yes	No	N/A
Equipment or parts missing?	Yes	No	N/A
Parts available for maintenance?	Yes	No	N/A

Electrical

Excessive corrosion?	Yes	No	N/A
Clean, well maintained contacts?	Yes	No	N/A
Parts available for maintenance?	Yes	No	N/A

Piping

Excessive corrosion?	Yes	No	N/A
Excessive leaks?	Yes	No	N/A
Paint in good condition?	Yes	No	N/A

*** Condition / Level of Service**

1 - Very Good

2 - Minor Defects

3 - Requires Significant Maintenance

4 - Requires Rehabilitation

5 - Requires Replacement (>50%)

0 - Non-Existent

Facility / System Condition Assessment Form

Facility / System:	Pomona Recycled Water System	Current Year	
Process / Basin / Zone:	PWRP Pump Station	Current ENR	
Component / Subbasin / Subzone:	Small Booster C		
Discipline:	Structural / Architectural		

Main Tab

Level of Service *		1		2		3		4		5	0
Criticality											
Public Health & Safety	Multiple		Single		Seasonal		No Effect				
Environmental	Major			Minor			No Effect				
Cost of Repair	>$20			$5-$20			<$5				
Effect on Customers	Major			Minor			No Effect				
Vulnerability	1	2	3	5	10	20	50	100	150		
Condition *	1		2		3		4		5	0	

Annual Maintenance Cost	
Installation Year	
Original Useful Life	
Date of Inspection	
Assessed By	
Photo #	
Acquisition Cost	
Replacement Value	
Salvage Value	

Component Information Tab

ID Number			
Manufacturer/Model (nameplate info)			
Comments			

Spalling concrete?	Yes	No	N/A
Excessive corrosion to structure?	Yes	No	N/A
Excessive corrosion to members?	Yes	No	N/A
Corrosion coating intact and in place?	Yes	No	N/A
Paint in good condition?	Yes	No	N/A
Visible structural deformaties?	Yes	No	N/A
Foundation settling evident?	Yes	No	N/A
Major cracks?	Yes	No	N/A

*** Condition / Level of Service**

1 - Very Good

2 - Minor Defects

3 - Requires Significant Maintenance

4 - Requires Rehabilitation

5 - Requires Replacement (>50%)

0 - Non-Existent

Facility / System Condition Assessment Form

Facility / System:	Pomona Recycled Water System	Current Year	
Process / Basin / Zone:	PWRP Pump Station	Current ENR	
Component / Subbasin / Subzone:	Small Booster C		
Discipline:	Civil / Sitework		

Main Tab

Level of Service *	1	2	3	4	5	0					
Criticality											
Public Health & Safety	Multiple		Single		Seasonal		No Effect				
Environmental	Major			Minor			No Effect				
Cost of Repair	>$20			$5-$20			<$5				
Effect on Customers	Major			Minor			No Effect				
Vulnerability	1	2	3	5	10	20	50	100	150		
Condition *	1	2	3	4	5	0					

Annual Maintenance Cost	
Installation Year	
Original Useful Life	
Date of Inspection	
Assessed By	
Photo #	
Acquisition Cost	
Replacement Value	
Salvage Value	

Component Information Tab

ID Number

Manufacturer/Model (nameplate info)

Comments

Sitework			
Several potholes?	Yes	No	N/A
Excessive erosion?	Yes	No	N/A
Severe road degradation evident?	Yes	No	N/A
Functional ground cover?	Yes	No	N/A
Fencing adequate and well maintained?	Yes	No	N/A
Facilities adequately secured?	Yes	No	N/A
Space for expansion?	Yes	No	N/A
Civil			
Presence of clay liner?	Yes	No	N/A
Excessive erosion on berm interior?	Yes	No	N/A
Excessive erosion on berm exterior?	Yes	No	N/A
Vegetation along berms?	Yes	No	N/A
Noticeable settlement of berms?	Yes	No	N/A
Presence of seepage on outer edge of berms?	Yes	No	N/A
Presence of burrow holes?	Yes	No	N/A
Presence of riprap or other erosion protection?	Yes	No	N/A
Adequate erosion protection?	Yes	No	N/A
Excessive algal blooms?	Yes	No	N/A
Adequate drainage?	Yes	No	N/A

*** Condition / Level of Service**

1 - Very Good

2 - Minor Defects

3 - Requires Significant Maintenance

4 - Requires Rehabilitation

5 - Requires Replacement (>50%)

0 - Non-Existent

Appendix H

TM NO. 04 - SYSTEM EVALUATION

This Appendix presented intermediate work products that were further modified during the preparation of this recycled water master plan. Hence, the information presented (such as demands, supply options, and pipeline layout) herein may differ from the recommended system described in Chapters 8 and 9.

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City of Pomona

RECYCLED WATER MASTER PLAN

TECHNICAL MEMORANDUM NO. 4
SYSTEM EVALUATION

DRAFT
May 2009

199 SOUTH LOS ROBLES AVENUE • SUITE 530 • PASADENA, CALIFORNIA 91101 • (626) 535-0180 • FAX (626) 535-0185

Technical Memorandum No. 4

SYSTEM EVALUATION

Technical Memorandum No. 4 is Chapter 7 of the Recycled Water Master Plan Report and presents a discussion of both existing and future system evaluations.

The location of this document in relation to the entire master plan is as follows:

Chapter No.	Chapter Title
1	Introduction
2	Existing Recycled Water System
3	Recycled Water Demands
4	Recycled Water Supplies
5	Planning and Evaluation Criteria
6	Hydraulic Model
7	System Evaluation
8	Capital Improvement Program

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City of Pomona

Recycled Water Master Plan

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APPENDIX A – Example Field Assessment Sheet

SYSTEM EVALUATION

In the previous chapters, the potential demand and supply were quantified. In addition, performance criteria were identified and a hydraulic model was created and calibrated to real time conditions. This chapter begins with an evaluation of the existing system in order to identify issues that must be resolved for continued system operation and for preparation of future system expansions. Using information from previous chapters, this chapter uses the hydraulic model to evaluate potential system expansion alternatives that are within demand, supply, and performance criteria constraints.

This first section of the chapter lists the accepted evaluation criteria. The second section of the chapter discusses the existing system evaluation. The existing system evaluation consists of three sections: the condition assessment, the hydraulic analysis, and the operational analysis. For all three analyses, when appropriate, recommendations are made for system deficiency correction and system optimization. The third section of this chapter discusses the future system evaluation and includes a number of expansion projects called segments. The various expansion segments are grouped into different alternatives. The future system evaluation concludes with the selection of the most cost-effective alternative for implementing a recommended system. The next chapter, Chapter 8, describes the Capital Improvement Program (CIP) for this recommended system.

7.1 EVALUATION CRITERIA

The evaluation criteria listed in Table 7.1 were used to evaluate the performance of the existing recycled water system and size improvements for the existing and future recycled water systems.

Table 7.1 System Evaluation Criteria
Recycled Water Master Plan
City of Pomona

Parameter	Evaluation Criteria		Demand Condition
System Pressure			
Minimum System Pressure	40	psi	Peak Hour Demand
Maximum System Pressure	80	psi	Minimum Hour Demand
Pipeline Velocity			
Max. Velocity (Diameter ≤ 12-inch)	4	fps	Peak Hour Demand
Max. Velocity (Diameter > 12-inch)	6	fps	Peak Hour Demand
Fraction Factor (Hazen-Williams)	130		All conditions
Storage Volume			
Operational Storage	50% of MMD[(1)]		Maximum Month Demand
Emergency Storage	10% of MMD		Maximum Month Demand

Pump Station Capacity		
For Zones with Gravity Storage	Meet MMD with largest unit o.o.s	Maximum Month Demand
For Zones without Gravity Storage	Meet PHD with largest unit o.o.s	Peak Hour Demand
Backup Power	Meet MMD with power outage	Maximum Month Demand
Notes: (1) Storage is sized to account for fluctuations in the Pomona Water Reclamation Plant diurnal flow.		

7.2 EXISTING SYSTEM EVALUATION

The existing recycled water system evaluation consists of three parts, a condition assessment of existing assets, a hydraulic analysis, and an operational analysis. For all three analyses, recommendations are made, as appropriate, for deficiency correction and optimization. The goal of the existing system evaluation is to identify system improvements required for continued system operation and increased system utilization in future expansions. The first section is the condition assessment followed by the hydraulic analysis and operational analysis.

7.2.1 Condition Assessment

The condition assessment was undertaken to verify that the existing facilities are in a suitable condition for both continued system operation and system expansion. The condition assessment included a field evaluation of key assets by a multi-discipline engineering team licensed and experienced in the areas of civil engineering, mechanical engineering, and structural engineering. The assessment team visited the City's recycled water facilities, inspected the major assets, and interviewed operation and maintenance (O&M) personnel regarding the operation and maintenance history of the major assets. Figure 7.1 shows the location of the facilities evaluated during the assessment.

The information gathered during the condition assessment provides a standardized record of the asset condition specific to each discipline. Data collected for each asset included condition, installation year, and discipline specific data as applicable. In addition, other relevant information, such as recent performance history, and design and sizing criteria was gathered where available, and the existing condition of all assets was documented with digital photos. To standardize the process of determining an asset's condition, specific discipline-related questions were answered for each asset. Sample field sheets and discipline questions are presented in Appendix A. The assessment includes the determinations of the following criteria:

- Condition Assessment Ranking
- Level of Service

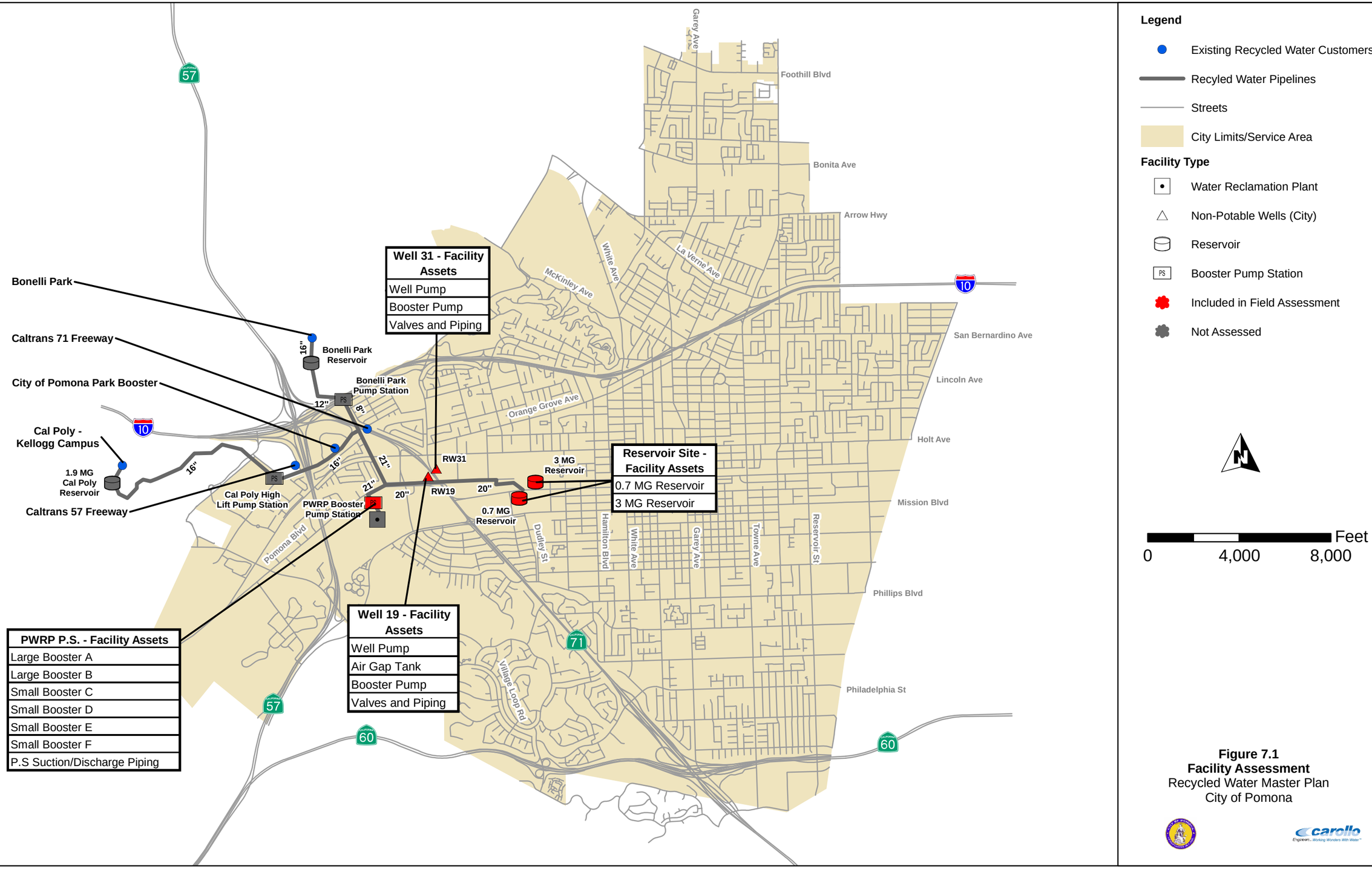

Figure 7.1
Facility Assessment
Recycled Water Master Plan
City of Pomona

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- Original and Remaining Useful Life
- Economic Remaining Useful Life
- Replacement Value
- Repair Cost

The following sections describe each of these condition assessment criterions, which are then used as the basis for evaluating the most cost-effective means of maintaining the City's existing recycled water system and prioritizing potential rehabilitation and replacement (R&R) projects.

Asset Condition Ranking

The ranking scale used in the condition assessment of each asset is shown in Table 7.2. Each asset was assigned a condition value based on the percentage of the value of the asset that was required to return each asset to essentially new condition (i.e., restored to original physical condition, useful life, etc.). This scale is an internationally accepted, industry-wide standard for designating asset condition. The condition ranking is related to the percentage of the value of an asset needed to repair/rehabilitate the asset to return it to its original condition. In the case where an asset was not accessible or was non-existent in the field, a ranking of 0 was assigned.

Table 7.2 Asset Condition Ranking Scale[(1)(2)]
Recycled Water Master Plan
City of Pomona

Ranking	Description	Percentage of Asset Requiring Repair[(2)]
0	Non-Existent/Not Assessed	N/A
1	Very Good Condition	0%
2	Minor Defects	5%
3	Maintenance Required to Return to Accepted Level of Service	10 to 20%
4	Requires Rehabilitation	20 to 40%
5	Asset Unserviceable	>50%

Notes:
(1) Adapted from the International Infrastructure Management Manual.
(2) "Percentage of asset requiring repair" is that percentage of the value of the asset needed to return the asset to a condition ranking of 1.

The repair percentages associated with each condition ranking are used to calculate the evaluated remaining useful life, evaluated value, and the necessary repair/rehabilitation costs to return the component to its original condition.

Each major asset was divided into three disciplines (as appropriate) and each discipline was assessed individually. The three disciplines were:

1. Mechanical/Electrical/Instrumentation/Piping.
2. Structural/Architectural.
3. Civil/Site Work.

Members of the field condition assessment team separately assigned a condition ranking for each discipline. The discipline-specific condition rankings were then compiled into the one overall component condition ranking based on a cost-weighted basis.

Level of Service

Level of Service (LOS) defines the target condition value desired for each asset. The ranking scale used to assign a LOS to each asset is the same as the condition scale shown in Table 7.2. Ideally, all assets would be a Condition/LOS of 1. Realistically, it is uneconomical to maintain all City assets at a condition ranking of 1. Each asset was assigned a target LOS value of 2 (equivalent to an asset condition of 2; good condition). Although there are no specific reliability goals associated with the LOS rankings, an LOS value of 2 is considered reasonable for the City to meet its goals for recycled water distribution (i.e., if assets meet the LOS value of 2 and are therefore in good condition, it is expected that the City will meet its service goals).

The condition assessment was used to quantify any differences between the baseline level of service value and the current condition of each asset. If the current condition of the asset does not meet the designated LOS value, repairs will need to be made to improve the asset condition to meet the LOS goal. However, LOS goals for the assets can be modified based on the City's knowledge of the operations goals and maintenance history of individual assets. For example, if an asset will be replaced in the near future, the City may decide to decrease the LOS value for the existing asset. This would allow the condition of the existing asset to decrease slightly before it is replaced with a new asset, while preventing the expenditure of funds needed to maintain the existing asset in good condition (to meet the assigned LOS goal of 2). LOS is used to develop the repair costs.

Original and Remaining Useful Life

Original Useful Life is the number of years an asset is expected to be in service as a function of asset type (i.e., mechanical, structural, electrical, instrumentation and control) and Remaining Useful Life is the original useful life less the number of years an asset has been in service. Original useful life is used to develop the evaluated remaining useful life and economic remaining useful life. The original useful life values for different types of assets are presented in Table 7.3.

Table 7.3 Original Useful Life per Asset Type Recycled Water Master Plan City of Pomona	
Asset Type	**Original Useful Life**
Mechanical	20 years
Structural	50 years
Electrical	30 years
Instrumentation	15 years

Evaluated Remaining Useful Life

Evaluated Remaining Useful Life (ERUL) is based on the current condition of the asset and is the estimated remaining number of years until the physical failure of the asset. ERUL is often used in conjunction with Remaining Useful Life to better understand project needs. ERUL differs from remaining useful life because it incorporates the asset condition ranking. For example, the original useful life for structural components is listed as 50 years. If that asset is 49 years old, the remaining useful life will be only 1 year. However, in reality, if that asset is still in excellent condition, the "true" remaining life will be much more than 1 year.

ERUL is one method used to take into account the existing condition and ongoing maintenance work on the asset.

Economic Remaining Useful Life

The economic remaining useful life of an asset is the estimated period between the date of the condition assessment and the time when the asset degrades to a condition where repairing the asset ceases to be cost effective. It is important to keep in mind that the economic remaining useful life is only an estimate of the feasible operating period of an asset. Factors such as the operating environment, maintenance schedule, and other extraneous variables will influence the actual economic remaining useful life. For example, the economic remaining useful life of a newly purchased pump is equal to 20 years; however, the economic remaining useful life may continue to be 20 years, even several years after purchase if the pump is well maintained and run under low-stress conditions. Ultimately, if the pump continues to be well maintained, it may be feasible to run it for more than 20 years.

Replacement Value

For this project, replacement value is defined as the cost to replace the asset with a similar piece of equipment in April 2009 dollars.

Replacement costs were developed for each of the key assets based on Carollo's experience with infrastructure costs at similar facilities. Ultimate project costs at the time of construction are dependent on actual labor and material costs, actual site conditions, competitive market conditions, final project scope, final project schedule, and other factors.

Because of these factors, funding needs must be carefully reviewed prior to making specific financial decisions or establishing final budgets.

The level of accuracy for construction cost estimates varies depending on the level of detail to which the project has been defined. Feasibility studies and master plans represent the lowest level of accuracy, while pre-bid estimates (based on detailed plans and specifications) represent a higher level. The American Association of Cost Engineers has developed the following guidelines for developing project cost estimates:

Table 7.4 Project Cost Estimate Guidelines
Recycled Water Master Plan
City of Pomona

Type of Estimate	Anticipated Accuracy
Order-of-Magnitude (Master Plans)	+50% to -30%
Budget Estimate (Pre-design Report)	+30% to -15%
Budget Estimate (Pre-design Report)	+15% to -5%

The opinions of cost presented in this report should be considered order-of-magnitude estimates, with an anticipated level of accuracy of +50 to -30 percent. The cost opinions for each of the listed assets represent April 2009 dollars consistent with the Los Angeles Engineering News-Record (ENR) value 9974.

Repair Costs

Repair costs are defined as the cost required to return an asset to a specified level of service, in this case a LOS of 2. Repair costs are as a percentage of the replacement cost based on the assessed condition. In the case of assets with a condition of 5, repair costs are equivalent to replacement costs. It should be noted that the developed repair costs represent relative numbers useful for prioritizing R&R projects. These costs are not intended to directly correlate to potential alternatives related to each asset. In some cases, it may be more practical not to repair specific assets, but rather to replace them when their various remaining useful lives expire. For these reasons, the repair costs identified herein for each asset should be revisited prior to implementing repair projects.

Assessment Results

Based on the aforementioned criteria, the above ground assets in the City's recycled water distribution system are prioritized in Table 7.5 in order of perceived maintenance. Criteria used to prioritize these assets included condition, ERUL, and economic remaining useful life. This table should aid the City in making planning decision related to maintenance and operation, as well as capital decisions. R&R projects implemented based on the Table 7.5 will assist with the continued proper operation of the system during both existing conditions and under increased stresses from future system expansion.

Table 7.5 Existing Assets Prioritized by Condition and Economic Remaining Useful Life
Recycled Water Master Plan
City of Pomona

No.	Facility [1]	Asset Name[1]	Condition[2]	Level of Service	Replacement Value	Repair Cost[3]	Original Useful Life	Evaluated Remaining Useful Life	Economic Remaining Useful Life
1	PWRP PS	Pump Station Breaker	5	2	$30,000	$30,000	20	2	0
2	PWRP PS	Large Booster A	4	2	$125,000	$32,000	20	12	2
3	Well 19	Well Pump	4	2	$100,000	$26,000	20	12	2
4	PWRP PS	Small Booster E	4	2	$90,000	$24,000	20	12	2
5	PWRP PS	Small Booster D	4	2	$90,000	$23,000	20	12	2
6	PWRP PS	Suction/Discharge Piping	3	2	$225,000	$24,000	20	16	6
7	PWRP PS	Large Booster B	3	2	$125,000	$13,000	20	16	6
8	PWRP PS	Small Booster F	3	2	$90,000	$10,000	20	16	6
9	Well 31	Booster Pump	3	2	$60,000	$9,000	20	16	6
10	Well 19	Valves and Piping	3	2	$70,000	$7,000	20	16	6
11	Well 31	Valves and Piping	3	2	$65,000	$7,000	20	16	6
12	Well 19	Booster Pump	3	2	$65,000	$7,000	20	16	6
13	Well 19	Air Gap Tank	2	2	$30,000	$0	50	45	20
14	Reservoirs	3 MG Reservoir	2	2	$4,030,000	$0	49.8	44.8	19.9
15	Reservoirs	0.7 MG Reservoir	2	2	$1,430,000	$0	49.4	44.4	19.7
16	PWRP PS	Small Booster C	N/A	2	$0	$0	N/A	N/A	N/A
17	Well 31	Well Pump (Submersible	N/A	2	$0	$0	N/A	N/A	N/A
					Total Repair Cost	**$212,000**			

Notes:
(1) The location of these facilities and assets are shown on Figure 7.1.
(2) Condition rankings are a cost weighted average of discipline-specific condition rankings, and where applicable the mechanical and structural rankings are shown in parentheses by an M or S, respectively.
(3) Repair costs are project costs that include a contingency, general conditions, contractor overhead, sales tax, bid market allowances, and engineering, legal and construction fees.

In general, each facility required sand blasting and a new coat of paint. Several of the pumps at the recycled water pump station were corroded. At Well 19, the check valve for the connection to the distribution system was leaking. Also, the inlet/outlet pipe connections to the steel tank reservoirs are rigid and will not allow movement of the reservoir during a sizeable earthquake, consequently, these connections will fail during a large earthquake, causing damage to the tank. If interruption to service is a concern, replacement of the inlet/outlet pipe connection should be considered.

7.2.2 Hydraulic Analysis

The second system analysis, the hydraulic analysis, uses the calibrated hydraulic model to evaluate the existing recycled water system for possible deficiency correction and optimization under the following demand conditions:

- Average Day Demand
- Maximum Month Demand
- Peak Hour Demands

As previously mentioned the goal of the analysis is to identify system improvements required for efficient system operation and increased system utilization in future expansions

Average Day Demand

The model was run under average day demand (ADD) conditions to determine the maximum pressures that occur in the existing system. Under ADD conditions, the pressure fluctuates between 25-40 psi, which is below the minimum pressure criteria of 40 psi.

Maximum Month Demand

The model was again run under maximum month demand (MMD) conditions to determine the adequacy of existing storage. Under ADD conditions, the pressure fluctuates between 22-40 psi, which is below the minimum pressure criteria of 40 psi.

Under MMD, the storage volume in the two existing tanks never decreased below 70 percent of full capacity. In addition, the 3.7 MG of existing storage meets the evaluation criteria for operational and emergency storage requirements. Not only is system storage adequate, but capacity is available for future peak demands.

Peak Hour Demand

Pipes sizes were evaluated using peak hour demands (PHD) since this condition results in the greatest system flow rates. All the distribution mains in the City's existing system are 16-inch diameter and larger. Under peak hour conditions, pipe velocities do not exceed 6 ft/sec, the stated maximum in the evaluation criteria for a pipe with a diameter greater than 12-inches. As indicated on Figure 7.1, the 21-inch diameter pipeline and the 16-inch

diameter pipelines north of the Pomona Water Reclamation Plant (WRP) flow at the 6 ft/sec capacity when both the Cal Poly and Bonelli Park pump stations are operating at capacity. This analysis assumed the following capacities for these pump stations:

- Cal Poly Pomona Recycled P.S. - 3,900 gpm
- Bonelli Park Recycled P.S. - 2,100 gpm

Consequently, these two customers are unable to increase the capacity of their respective pump stations unless City pipelines are upgraded or parallel pipelines be installed.

System pressures were also evaluated under peak hour conditions. During peak hour conditions, system pressures fluctuated between 20-35 psi. Such pressures are below minimum pressure criteria of 40 psi. The pressures are low because the system floats on two reservoirs that have a low hydraulic grade line. These reservoirs are shown on Figure 7.1. Changes are not recommended for three reasons:

- Age of the Distribution System - The system was installed in the 1960s and increasing the pressure could create stress on the system that would increase the frequency of repairs.
- Customer Pump Stations - Existing customers with large demands, such as Cal Poly Pomona and Bonelli Park, use pump stations to pump recycled water from the system thus making a higher pressure unnecessary.
- System Modifications - The system operates under its current configuration. Spending money to install new pumps both at the reservoir and the pump station, so higher pressures can be sustained does not provide a significant benefit, especially, when the same resources could be utilized to expand the system to new customers.

In summary, according to the hydraulic analysis, the existing has adequate storage for both existing with space capacity for future needs. Pipelines are adequate for existing demands; however, the 16-inch and 21-inch diameter pipelines north of the Pomona WRP will need to be upgraded if Cal Poly or Bonelli Park upgrade their pump stations to a higher capacity in order to meet increased future demands. System pressures are lower than the evaluation criteria but these pressures are adequate for continued operation of the existing system; however, for a future system, pump stations will be required to pressurize expansions branching from the existing system.

7.2.3 System Operations Evaluation

An operational analysis was the third analysis performed on the existing system. For this analysis, existing system controls and monitoring were evaluated to determine opportunities to increase energy efficiency, optimize system performance, and increase system reliability. As part of this analysis, backup power configuration was also examined for possible changes.

System Controls and Monitoring

The City's SCADA system currently monitors the Pomona WRP Recycled Water Pump Station (PS) and the Recycled Water Reservoirs. Flow rates and system pressures are recorded at the pump station and water levels are recorded at the reservoirs. During operation, the system activates the fixed speed pumps at the pump station in order to maintain a desired hydraulic level in the two reservoirs (0.7 MG and 3 MG Reservoirs on Figure 7.1). The pumps operate off a small wet well that is downstream of the Pomona WRP chlorine contact basin effluent weir. As the water level in the wet declines, pumps deactivate.

The current configuration of the City's Recycled Water PS does not allow for energy savings through operational control modifications. Energy savings are typically realized if pumping operations are delayed until night when electricity rates are lower. Due to the absence of a recycled water effluent forebay at the City's Recycled Water PS and/or a gravity reservoir, the City must pump plant effluent whenever it is available. Otherwise, the plant effluent discharges into San Jose Creek from the overflow weir in the small wet well. Consequently, the City is unable to save energy by delaying pumping. The use of variable frequency drives (VFDs) however will increase the energy efficiency as discussed in more detail below.

The discharge of recycled water effluent into San Jose Creek is a condition that should be avoided during PHD periods. As part of this analysis, configuration changes were identified to help the City avoid unnecessary discharges to San Jose Creek and minimize the use of potable water during peak demand periods. These changes include:

- Installing VFDs on the Recycled Water PS at the Pomona WRP.
- Monitoring peak reservoir levels during peak seasonal demand periods in order to calculate the amount of potable water addition needed.

Recommendations are discussed below.

VFDs

Installing VFDs will allow the Recycled Water PS flow rate to closely match the effluent flow rate from the plant. If VFDs are installed, the City has the option to utilize almost all of the Pomona WRP flow when it is needed since it can match pump flow with the effluent flow from the plant. The City's fixed speed pumps are unable to closely match the plant effluent flow rate and the City must pump less than the effluent flow, otherwise the suction wet well will quickly be drawn down and the pumps will shut down. Currently, the City's five fixed speed pumps are able to supply the City's recycled system with an adequate quantity of recycled water from the plant since the existing demand is much less than the City's historical demand. However, as the City expands its system in the future, demand will start to match supply and the City will need the ability to pump its full two-thirds allocation of Pomona WRP effluent flow. If the City is to fully utilize the Pomona WRP as a supply

source, the City should consider installing VFDs on the pumps so that pump station flow matches plant effluent flow. The City may also want to evaluate completely replacing the pumps ranked as a Condition 4 (Pumps A, E, and D) with VFD pumps specifically sized for matching Pomona WRP flow. The use of VFDs will also increase the energy efficiency of the PS as the current fixed speed pumps are not operating at the desired range due to the decrease system demands.

Reservoir Level Monitoring

During the peak summer months when irrigation demands are high, there is the possibility that system demand will exceed system supply. In such a case, the hydraulic level in the City's existing reservoirs can balance and return to the initial water level over a 24-hour period. It is suggested that the City measure the difference between reservoir levels for a specified time of the day e.g. the difference between 12:00 pm on Monday and 12:00 pm on Tuesday. If the difference is significant (i.e. beyond normal fluctuation), the difference is most likely due to demand exceeding supply. In such a case, the difference in the measured level in a 24-hour period would equate to the exact amount of potable water addition needed for the system. SCADA could use this difference for automated potable water make-up addition, so that only the necessary amount of potable water is added to the system, while providing sufficient water in the reservoirs.

Backup Power

Currently, the City does not have backup power for its recycled water system. Facilities without backup power include Wells 19 and 33 and the Recycled Water PS at the Pomona WRP. The SCADA system does have backup power and the sensors at the two reservoirs have short-term batteries for continued communication with SCADA during an outage. The current backup power configuration is below desired evaluation criteria that stipulates adequate backup power for MMD. Since the City has a potable water connection to its existing reservoirs, the City has the option to augment recycled water supplies with potable water during a power outage. For future expansions, it is recommended that future facilities include backup power for MMD.

7.2.4 Summary of Existing System Recommendations

Based on the condition assessment, the hydraulic analysis, and the operational analysis, the following items are recommended for the City's existing recycled water system.

- Maintenance work should be prioritized according to the criteria in Table 7.5. A field assessment of major above ground assessment has identified a need to perform maintenance work to the recycled water pump station and the two wells in order to bring these assets to an acceptable condition level. R&R projects implemented based on the Table 7.5 will assist with the continued operation of the system during both existing conditions and under increased stresses from future system expansion.

- Pipelines are adequate for existing demands; however, the City would possibly need to upgrade the 16-inch and 21-inch diameter pipelines north of the Pomona WRP if either Cal Poly or Bonelli Park upgrades their pump station to a higher capacity. For this reason, the City should monitor and be involved with any plans either entity may have for enlarging their pump stations.
- The City should continue to maintain the current pressures in the existing system even through these pressures are below the values in the evaluation criteria. The current pressure values are adequate for continued operation of the existing system; however, for a future system, pump stations will be required to pressurize expansions branching from the existing system.
- The City should install VFDs at the existing recycled water PS at the Pomona WRP. Due to the condition of some of the pumps (see Table 7.5), the City may want to consider completely replacing some pumps with new pumps specifically sized to meet pumping needs with a VFD. These VFDs will allow the City to fully utilize the effluent flow from the Pomona WRP while avoiding unnecessary discharges to San Jose Creek during peak demand periods.
- The City may want to consider measuring the difference in reservoir level between days. SCADA could use the difference to calculate a difference in volume. SCADA could use this difference for automated potable water make-up addition, so only the necessary amount of potable water is added to the system while maintaining sufficient storage capacity in the reservoirs.
- The City currently does not have backup power for continued operation of the recycled water facilities during a power outage. However, the City does have a potable water make-up connection that can be used to augment recycled water supplies should customers demand more water during a prolonged outage. It is recommended that future facilities include provisions for backup power.

7.3 FUTURE SYSTEM EVALUATION

Using information from previous chapters, the future system evaluation uses the hydraulic model to develop potential system expansion alternatives that are within demand, supply, and evaluation criteria constraints. This section discusses the methodology used for the creation and selection of an alternative for implementing recycled water system expansion projects. The development of a recommended system includes the following steps:

- Development of the initial system layout
- Division of the initial layout into segments
- Definition of segment requirements
- Grouping of segments into alternatives.

- Evaluation of Alternatives

This section concludes with the selection of the most cost-effective alternative for implementing a recommended system.

The first step in developing a future system is initially laying out a potential system according to the identified demands and supplies from the previous chapters. The initial layout attempts to find an ideal solution for serving the entire City. Accordingly, pipelines are placed to both maximize demand and minimize cost. This initial layout is shown on Figure 7.2. As shown in this figure, customer demands are displayed according to their magnitude. Pipes are located such that the system can serve the maximum demand with the minimum total pipeline length. Basically, this means connecting large customers first (anchor customers) and then connecting small “pick-up” customers where feasible along the main alignments to these anchor customers.

Even though, the initial layout provides the best cost-solution for serving the entire City, the total cost is relatively high. In order to make expansion of the recycled water system manageable, the initial system layout was divided into segments. The division of the initial system layout into segments is shown in Figure 7.3. When possible, segments isolate portions of the initial system layout that have a cost-effectiveness that is greater than original cost-effectiveness of the initial system layout. Typically, these more cost effective segments include a large customer or anchor at the end of the segment that increases demand and reduces cost. Consequently, the cost effectiveness of the segments will vary. Ultimately, the various segments are sequenced into different alternatives. The ideal alternative starts with the implementation of the most cost effective segment and ends with the implementation of the least cost effective segment. Nine segments were created from the initial system layout. As shown on Figure 7.3, the segments are:

- Segment 1: Existing System - This segment focuses on the existing system. This segments includes connecting customers adjacent to the existing system and making modifications to existing customer systems, so that they may use more recycled water.
- Segment 2: Lanterman Extension - This segment extends the existing system south to Lanterman Hospital with a rehabilitated 12-inch diameter water line.
- Segment 3: Fairplex/Ganesha Park Expansion - This segment extends the existing system to Ganesha Park and the Fairplex, which act as anchor customers.
- Segment 4A: North Extension - Segment 4A is an expansion of the existing system to the area immediately north of the existing system.
- Segment 4B: Park West Extension - Segment 4B extends the existing system from Segment 3 to supply customers between Ganesha Park and Park West High School.

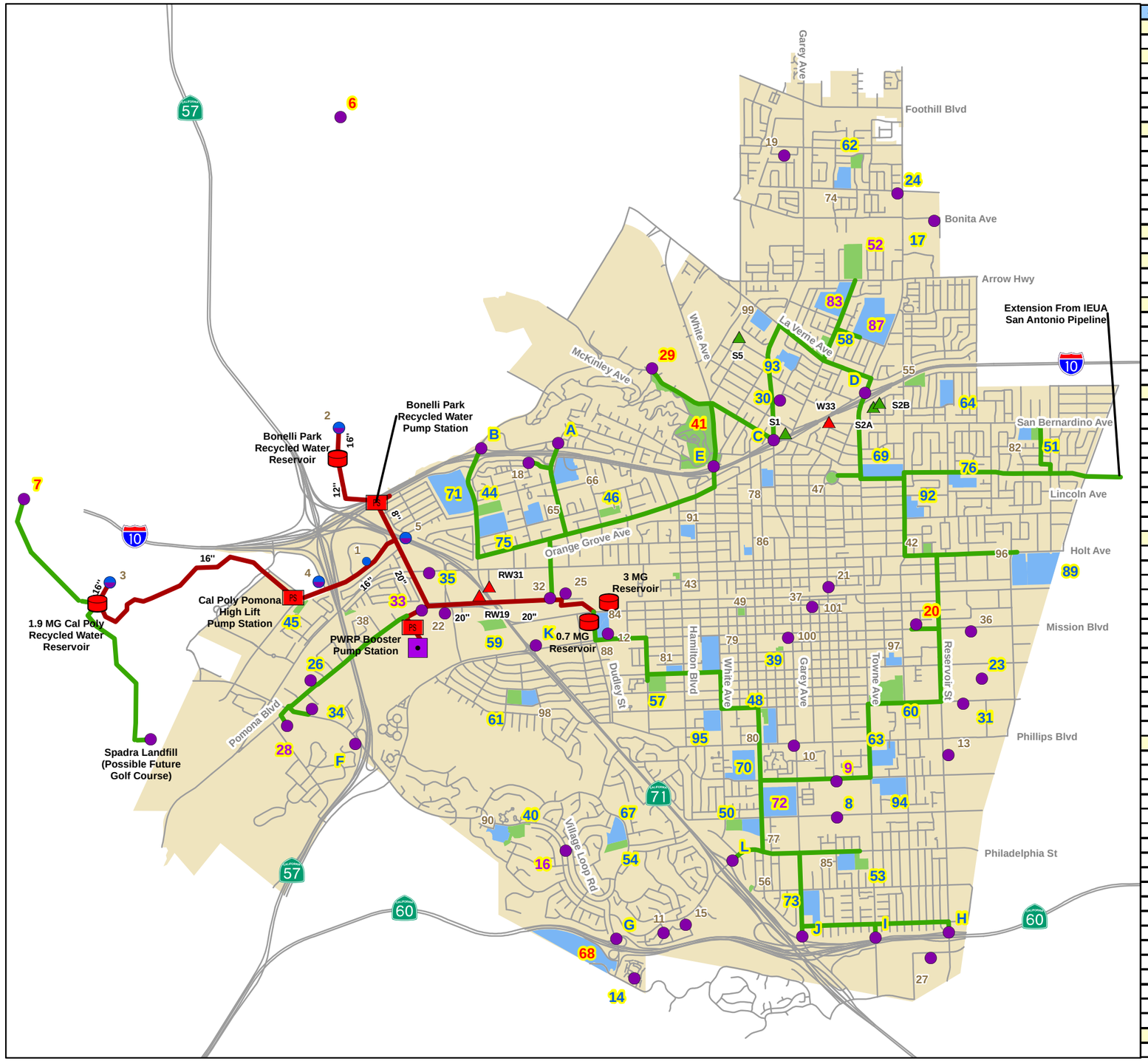
- Segment 5: East Side Expansion - Using the Inland Empire Utilities Agency (IEUA) as a supply source, this segment extends recycled water service to the east side of the City. Braun Linens acts as an anchor customer for the segment.
- Segment 6: East Side Extension to Garey High - This segment maximizes use of the IEUA supply by extending the initial east side extension to a Garey Senior High School.
- Segment 7: East Side/Existing System Connection - If additional IEUA supply is available, this segment extends service from Segment 6 to additional customers while also connecting the east side system to the City's existing system.
- Segment 8: East Side Extension to Route 60 - If additional IEUA supply is available, this segment extends service from Segment 6 to additional customers adjacent to Route 60.

In addition to the customer and segments, Figure 7.3 also displays the required facilities such as pump stations, reservoirs, and pressure reducing valves (PRVs). Due to topography, the system would require multiple pressure zones as shown on Figure 7.4. Pipe sizes are displayed on Figure 7.5. Each segment was modeled under the conditions for each pressure zone in order to determine the appropriate sizing of pipes, reservoirs, and pump stations according to the evaluation criteria in Section 7.1. Each segment is discussed in more detail in the following sections.

7.3.1 Segment 1 - Existing System

Segment 1 connects additional customers adjacent to the existing system and recommends modifications to existing customer systems, so that they may use more recycled water. This segment is shown on Figure 7.3.

- According to the demand projections from Chapter 3, existing customers could increase their MMD by 1.8-mgd to the values shown in Table 7.6.



Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
B	I-10 & Fairplex	H	SR-60 & Reservoir Rd.
C	I-10 & Garey	I	SR-60 & Towne
D	I-10 & Towne	J	SR-71 & Garey
E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
Potential Customers - Cemeteries			
7	Forest Lawn Mortuary	9	Pomona Cemetery
8	Holy Cross Cemetery		
Potential Customers - Homeowners Associations			
10	Amcal Portofino Villas	15	Phillips Meadows
11	Country Pk Villas	16	Phillips Ranch
12	Estates-Pomona Westland	17	Quail Creek Pomona
13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
20	Braun Linen Service	29	Pomona Fairplex
21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
37	Centennial Park	50	Mlk Jr Memorial Park
38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
40	Country Crossing Park	53	Philadelphia Park
41	Ganesha Park	54	Phillips Ranch Park
42	Garfield Park	55	Pomona Jaycee Park
43	Hamilton Park	56	Powers Park
44	John F. Kennedy Park	57	Ralph Welch Park
45	Kellogg Park	58	Ted Greene Park
46	Kiwanis Park	59	Veterans Park
47	Lincoln Park	60	Washington Park
48	Madison Park	61	Westmont Park
49	Memorial Park	62	Willie White Park
Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
66	Cortez Elementary	85	Philadelphia Elementary
67	Decker Elementary	86	Pomona Alternative (PAS)
68	Diamond Ranch Senior High	87	Pomona Senior High
69	Emerson Middle	88	Pomona Vocational
70	Fremont Middle	89	Pueblo Elementary
71	Ganesha Senior High	90	Ranch Hills Elementary
72	Garey Senior High	91	Roosevelt Elementary
73	Garey Village (HS)	92	San Antonio Elementary
74	Harrison Elementary	93	San Jose Elementary
75	John Marshall Middle	94	Simons Middle
76	Kingsley Elementary	95	Vejar Elementary
77	Lexington Elementary	96	Village Academy (HS)
78	Lincoln Elementary	97	Washington Elementary
79	Lopez Elementary	98	Westmont Elementary
80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Wells (City)
- Non-Potable Wells (Simpson Paper Company)
- Booster Pump Station
- Reservoir
- Recyled Water Pipelines
- Potential New Recycled Water Pipelines
- Streets

Reycled Water Customers

- Existing Recycled Water Customers
- Existing Recycled Water Customers with Additional Supply Needs
- Potential Recycled Water Customers
- Potential Recycled Water Customers - Parks
- Potential Recycled Water Customers - Schools
- City Limits/Service Area

Text:

	Demand (ac-ft/yr)
6	> 100
16	40 - 100
76	10 - 40
81	< 10

N

0 3,000 6,000 Feet

Figure 7.2
Initial System Layout by Customer Demand
Recycled Water Master Plan
City of Pomona

carollo
Engineers...Working Wonders With Water™

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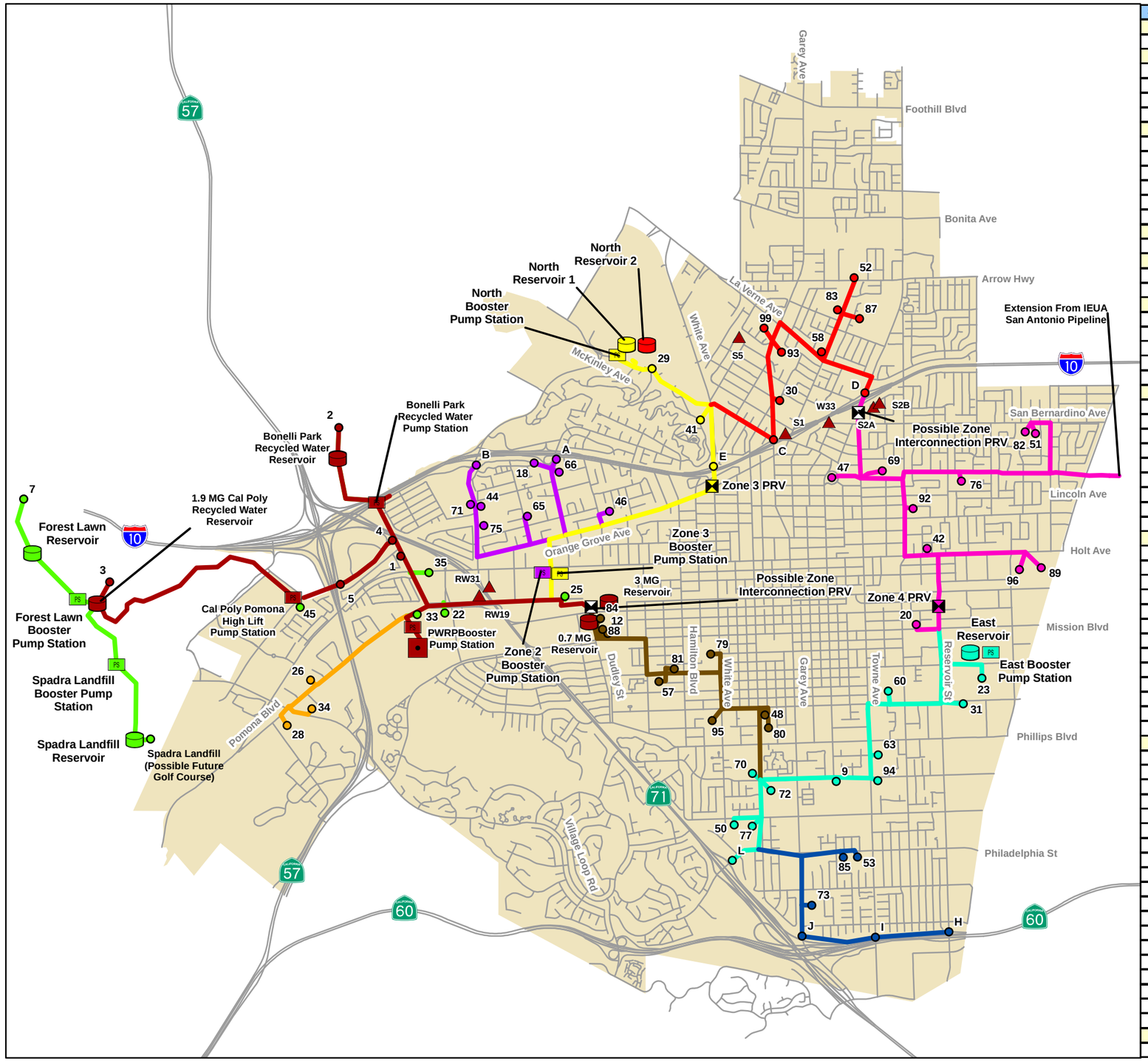

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80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Well
- Booster Pump Station
- Reservoir
- PRV
- Existing or Potential Recycled Water Customer
- Pipeline
- Existing System
- Segment 1
- Segment 2
- Segment 3
- Segment 4A
- Segment 4B
- Segment 5
- Segment 6
- Segment 7
- Segment 8
- Streets
- City Limits/Service Area

Feet
0 3,000 6,000

Figure 7.3
Potential System Segments
Recycled Water Master Plan
City of Pomona

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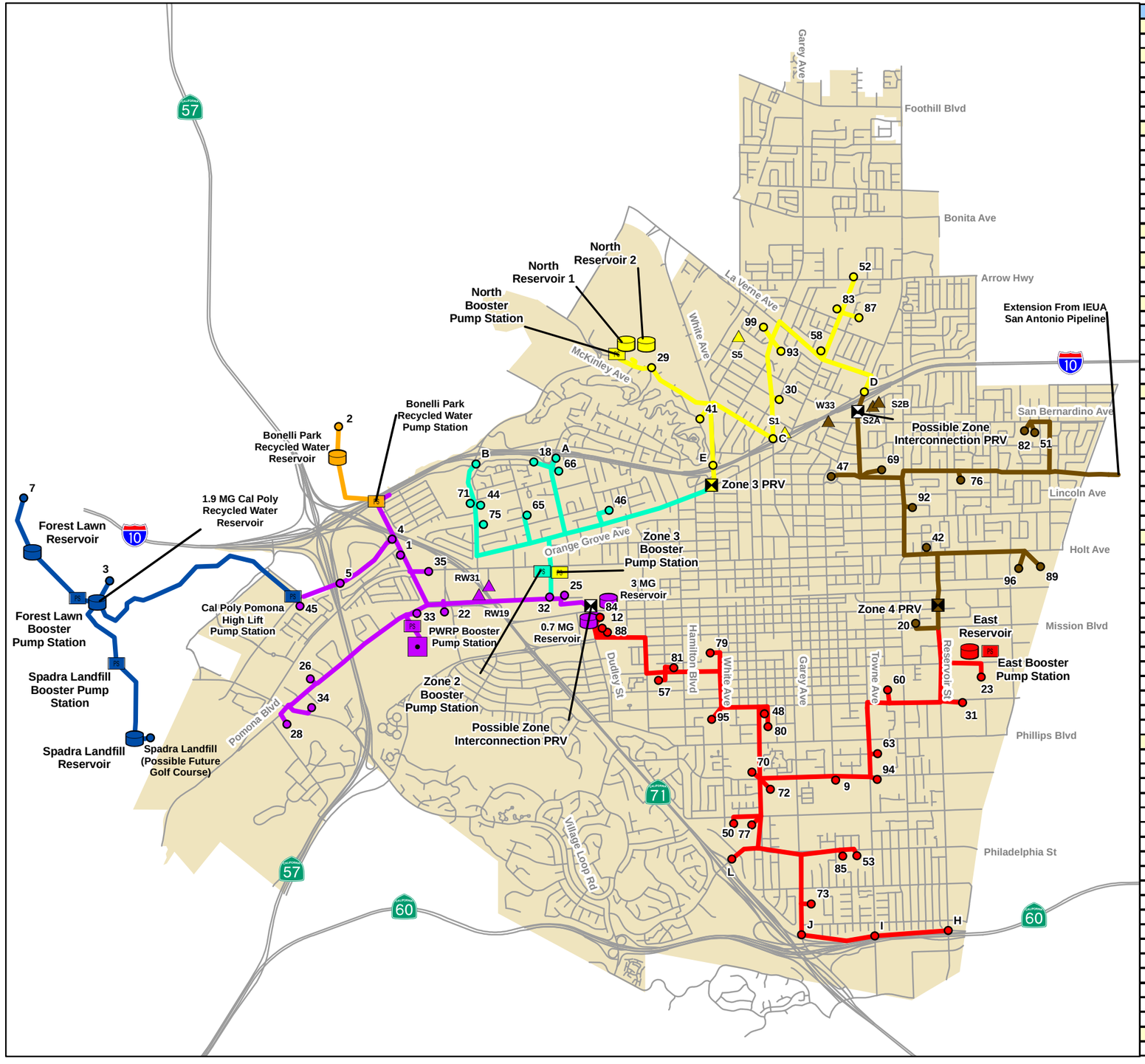

Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
B	I-10 & Fairplex	H	SR-60 & Reservoir Rd.
C	I-10 & Garey	I	SR-60 & Towne
D	I-10 & Towne	J	SR-71 & Garey
E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
Potential Customers - Cemeteries			
7	Forest Lawn Mortuary	9	Pomona Cemetery
8	Holy Cross Cemetery		
Potential Customers - Homeowners Associations			
10	Amcal Portofino Villas	15	Phillips Meadows
11	Country Pk Villas	16	Phillips Ranch
12	Estates-Pomona Westland	17	Quail Creek Pomona
13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
20	Braun Linen Service	29	Pomona Fairplex
21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
37	Centennial Park	50	Mlk Jr Memorial Park
38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
40	Country Crossing Park	53	Philadelphia Park
41	Ganesha Park	54	Phillips Ranch Park
42	Garfield Park	55	Pomona Jaycee Park
43	Hamilton Park	56	Powers Park
44	John F. Kennedy Park	57	Ralph Welch Park
45	Kellogg Park	58	Ted Greene Park
46	Kiwanis Park	59	Veterans Park
47	Lincoln Park	60	Washington Park
48	Madison Park	61	Westmont Park
49	Memorial Park	62	Willie White Park
Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
66	Cortez Elementary	85	Philadelphia Elementary
67	Decker Elementary	86	Pomona Alternative (PAS)
68	Diamond Ranch Senior High	87	Pomona Senior High
69	Emerson Middle	88	Pomona Vocational
70	Fremont Middle	89	Pueblo Elementary
71	Ganesha Senior High	90	Ranch Hills Elementary
72	Garey Senior High	91	Roosevelt Elementary
73	Garey Village (HS)	92	San Antonio Elementary
74	Harrison Elementary	93	San Jose Elementary
75	John Marshall Middle	94	Simons Middle
76	Kingsley Elementary	95	Vejar Elementary
77	Lexington Elementary	96	Village Academy (HS)
78	Lincoln Elementary	97	Washington Elementary
79	Lopez Elementary	98	Westmont Elementary
80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Well
- Booster Pump Station
- Reservoir
- PRV
- Existing or Potential Recycled Water Customer
- Pipeline
- Bonelli Park
- Cal Poly Pomona
- Zone 1
- Zone 2
- Zone 3
- Zone 4
- Zone 5
- Streets
- City Limits/Service Area

Feet
0 3,000 6,000

Figure 7.4
Potential System Zones
Recycled Water Master Plan
City of Pomona

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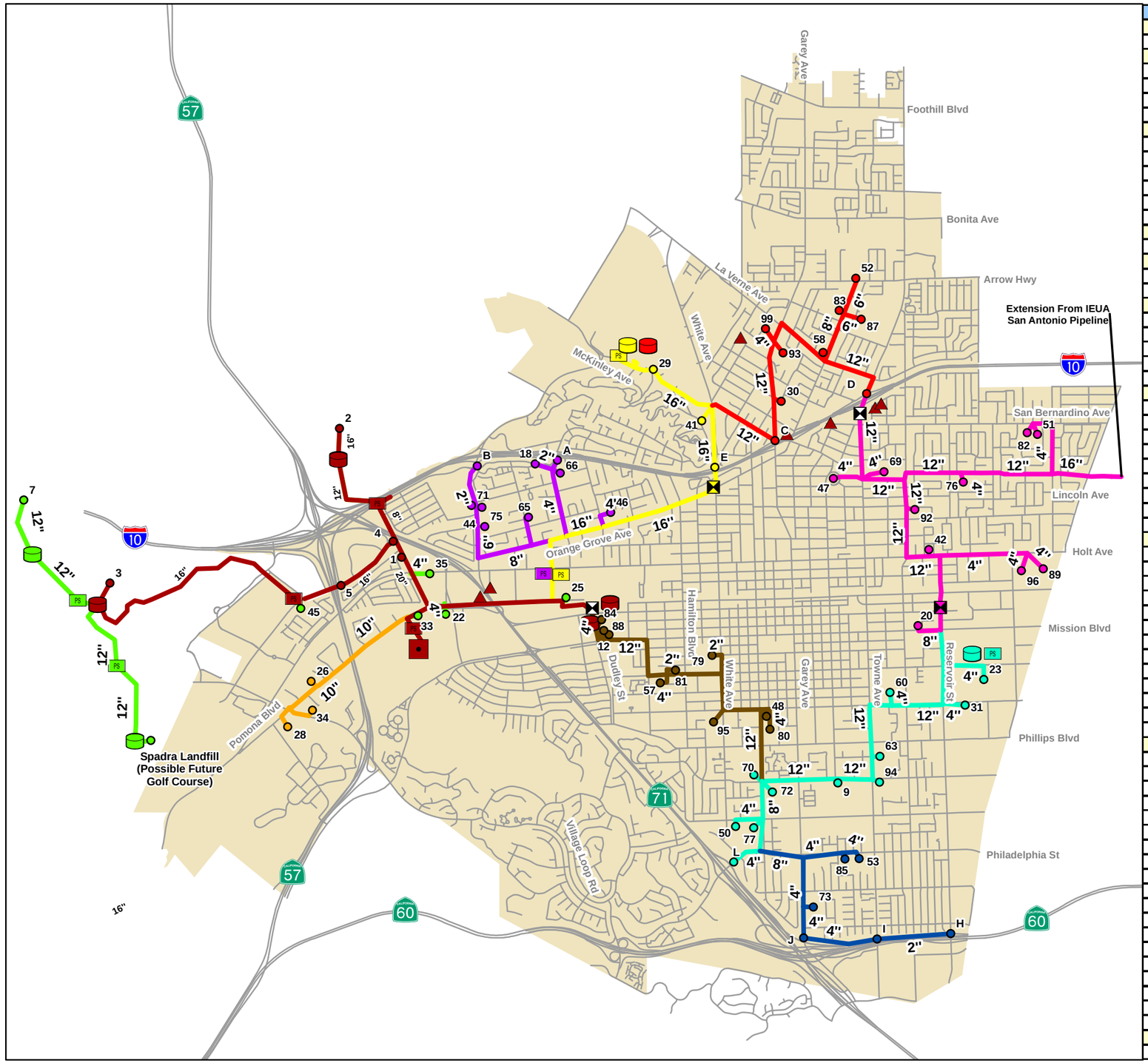

Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
B	I-10 & Fairplex	H	SR-60 & Reservoir Rd.
C	I-10 & Garey	I	SR-60 & Towne
D	I-10 & Towne	J	SR-71 & Garey
E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
Potential Customers - Cemeteries			
7	Forest Lawn Mortuary	9	Pomona Cemetery
8	Holy Cross Cemetery		
Potential Customers - Homeowners Associations			
10	Amcal Portofino Villas	15	Phillips Meadows
11	Country Pk Villas	16	Phillips Ranch
12	Estates-Pomona Westland	17	Quail Creek Pomona
13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
20	Braun Linen Service	29	Pomona Fairplex
21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
37	Centennial Park	50	Mlk Jr Memorial Park
38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
40	Country Crossing Park	53	Philadelphia Park
41	Ganesha Park	54	Phillips Ranch Park
42	Garfield Park	55	Pomona Jaycee Park
43	Hamilton Park	56	Powers Park
44	John F. Kennedy Park	57	Ralph Welch Park
45	Kellogg Park	58	Ted Greene Park
46	Kiwanis Park	59	Veterans Park
47	Lincoln Park	60	Washington Park
48	Madison Park	61	Westmont Park
49	Memorial Park	62	Willie White Park
Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
66	Cortez Elementary	85	Philadelphia Elementary
67	Decker Elementary	86	Pomona Alternative (PAS)
68	Diamond Ranch Senior High	87	Pomona Senior High
69	Emerson Middle	88	Pomona Vocational
70	Fremont Middle	89	Pueblo Elementary
71	Ganesha Senior High	90	Ranch Hills Elementary
72	Garey Senior High	91	Roosevelt Elementary
73	Garey Village (HS)	92	San Antonio Elementary
74	Harrison Elementary	93	San Jose Elementary
75	John Marshall Middle	94	Simons Middle
76	Kingsley Elementary	95	Vejar Elementary
77	Lexington Elementary	96	Village Academy (HS)
78	Lincoln Elementary	97	Washington Elementary
79	Lopez Elementary	98	Westmont Elementary
80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Well
- Booster Pump Station
- Reservoir
- PRV
- Existing or Potential Recycled Water Customer
- Pipeline
- Existing System
- Segment 1
- Segment 2
- Segment 3
- Segment 4A
- Segment 4B
- Segment 5
- Segment 6
- Segment 7
- Segment 8
- Streets
- City Limits/Service Area

N

0 3,000 6,000 Feet

Figure 7.5
Pipe Sizes
Recycled Water Master Plan
City of Pomona

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Table 7.6 Existing System Customer Demand - Year 2030
Recycled Water Master Plan
City of Pomona

Customer	ADD (ac-ft/yr)	ADD (mgd)	MMD (mgd)
City of Pomona- Park Booster	17	0.015	0.03
Bonelli Park[5]	1,211	1.0	2.3
SR-57 South Campus. Dr.	26	0.023	0.05
SR-71 South Campus. Dr	51	0.046	0.1
Cal Poly Pomona	1,116	1.0	2.14
Spadra Landfill[3]	413	0.4	0.8
Forest Lawn Mortuary [1]	331	0.3	0.63
Cal Poly Recycled System Total	860	1.7	3.57
Existing Customer Total	**2,165**	**2.9**	**6.0 [2]**

Notes:
(1) Includes Forest Lawn recycled water demand since Forest Lawn would connect to the existing Cal Poly Pomona recycled water distribution system.
(2) Current existing customer MMD is 4.2 mgd. This is a 1.8 mgd increase.
(3) Cal Poly could possibly create a golf course on the landfill.

This increase in demand to 6-mgd MMD is due to Bonelli Park and the Cal Poly Recycled Water Systems. Bonelli Park intends to increase the amount of irrigated parkland. Cal Poly intends to both provide recycled water to Forest Lawn and irrigate the Spadra Landfill, which could possibly be the site of a future golf course.

Bonelli Park System

According to Table 7.6, Bonelli Park could increase its MMD to 2.3 mgd (1,600 gpm).The existing Bonelli Park facilities should be sufficient for supplying the park under the increased demand. Existing facilities include:

- Recycled Water Pump Station - 2,100 gpm capacity.

Recycled Water Reservoir - 3.5 MG capacity.Cal Poly Pomona System

According to Table 7.6, The Cal Poly Pomona recycled water system could increase its MMD to 3.6 mgd (2,500 gpm). The existing Cal Poly facilities listed should be sufficient for supplying the system under the increased demand if additional recommended facilities are installed. The existing and recommended facilities are shown on Figure 7.3. Existing facilities include:

- Recycled Water Pump Station - 3,900 gpm capacity (3 pumps).
- Recycled Water Reservoir - 1.9 MG capacity.

Additional recommended facilities include:

- Forest Lawn PS - 3 fixed speed pumps (2 duty and 1 standby), 60 hp each
- Forest Lawn Reservoir - 2 existing tanks, 100,000 gallons each
- Spadra Landfill PS - 3 fixed speed pumps (2 duty and 1 standby), 30 hp each
- Spadra Landfill Reservoir - 800,000 gallon tank

The existing Cal Poly Pump Recycled Water Pumps station has the capacity to supply the required flow to the Cal Poly recycled water system. Within the Cal Poly system, pump stations are recommended for supplying both Forest Lawn and Spadra Landfill because of elevation differences. A new reservoir is recommended for Spadra Landfill because the existing Cal Poly reservoir does not have sufficient capacity to supply Spadra Landfill during peak seasonal demand. A reservoir is recommended for Forest Lawn because the reservoir will aid in the operational control of the downstream pump station. In addition, Forest Lawn has indicated that two vacant 100,000-gallon reservoirs on its site could be converted to recycled water use, although the existing 1.9 MG Cal Poly Reservoir will still act as the main reservoir for Forest Lawn.

The adequacy of existing facilities and the sizing of new recommended facilities were based on the following system control assumptions listed in Table 7.7.

Table 7.7 Segment 1 - Cal Poly System Control Assumptions.
Recycled Water Master Plan
City of Pomona

Asset	Switch On	Off	Comments
Cal Poly Recycled Water PS	1.9 MG reservoir is half full	1.9 MG reservoir is full.	Pumps could be set to switch on earlier in order to ensure adequate supply
Forest Lawn Booster PS	0.2 MG Forest Lawn storage is empty	0.2 MG storage is full.	Control set to maximize storage
Spadra Landfill Booster PS	0.8 MG Golf Course Storage is empty	0.8 MG storage is full.	Control set to maximize storage

The required facilities and the approximate cost for upgrading the Cal Poly system are summarized in Table 7.8.

Table 7.8 Segment 1 Project Cost Estimate - Cal Poly/Forest Lawn Recycled Water Master Plan City of Pomona

Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Size	Unit Cost	Total Cost
Golf Course at Spadra Landfill	0.8	413	5,000	12 inch	$230	$1,150,000
Forest Lawn Transmission Line	0.63	330	5,000	12 inch	$230	$1,150,000
Total Demand	**1.43**	**743**			**Pipeline Total**	$2,300,000
					Forest Lawn Reservoir (2 tanks rehabilitated)	$80,000
					Spadra Landfill Reservoir (800,000 gals at $2/gal)	$1,600,000
					Forest Lawn Pump Station (3 pumps 60 HP each at $5,000/hp)	$900,000
					Spadra Landfill PS (3 pumps 30 HP each at $6500/hp)	$585,000
					Construction Cost	**$5,465,000**
					30% Contingency	$1,639,500
					Subtotal	***$7,104,500***
					Mark-ups	$2,131,350
					Capital Cost	**$9,235,850**
					Cost/acre-ft(1)	**$872(1)**

Notes:
(1) Assumes pipelines and other structures depreciate over 50 years and mechanical equipment depreciates over 20 years.

Customers Adjacent to the Existing System

Segment 1 also includes connecting customers directly adjacent to the existing system. Potential customer connections and the associated costs are shown in Table 7.9.

Table 7.9 Segment 1 - Project Cost Estimate - Additional Customers
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost
22	Brown Grandstands Inc	0.01	10	100	4 inch	$130	$13,000
45	Kellogg Park	0.04	23	300	4 inch	$130	$39,000
33	Robertson's Ready Mix	0.09	63	200	4 inch	$130	$26,000
35	W.R. Meadows Inc.	0.04	28	700	4 inch	$130	$91,000
25	Ecoplast Corp	0.00	3	100	4 inch	$130	$13,000
	Total Demand	**0.19**	**126**			**Pipeline Total**	**$182,000**
						30% Contingency	$54,600
						Subtotal	***$236,600***
						Mark-ups	$70,980
						Capital Cost	**$307,580**
						Cost/acre-ft	**$155(1)**

Notes:
(1) Assumes pipelines and other structures depreciate over 50 years and mechanical equipment depreciates over 20 years.

Summary

Hydraulic modeling shows that the City's distribution system is adequate for the increased demands from both existing customers and new customer connections. The demand weighted average for implementing Segment 1 is $790/ac-ft.

7.3.2 Segment 2 - Lanterman Extension

Segment 2 involves extending the existing system to Lanterman Hospital with a rehabilitated existing 12-inch diameter water line. As shown on Figure 7.3, no new facilities are required for this segment. The cost for rehabilitating the line is estimated at $60 per foot based on discussions with City staff. Potential customer connections and the associated costs are shown in Table 7.10.

Table 7.10 Segment 2 -Summary and Cost
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost
34	Structure Composites	0.03	24	100	4 inch	$130	$13,000
26	Gemini Aluminum Corporation	0.02	13	300	4 inch	$130	$39,000
28	Lanterman Hospital	0.13	68	200	4 inch	$130	$26,000
	Rehabilitation of 12-inch diameter pipe			5,500	10 inch	$60	$330,000
	Total Demand	**0.18**	**105**			**Pipeline Total**	**$408,000**
						30% Contingency	$122,400
						Subtotal	***$530,400***
						Mark-ups	$159,120
						Capital Cost	**$689,520**
						Cost/acre-ft	**$418[(1)]**

Notes:
(1) Assumes pipelines and other structures depreciate over 50 years and mechanical equipment depreciates over 20 years.

Hydraulic modeling verified that the City's existing system is capable of adequate performance under increased demands from both Segments 1 and 2. The cost for implementing Segment 2 is about $418/ac-ft.

7.3.3 Segment 3 - Fairplex/Ganesha Park Expansion

For this segment, Ganesha Park and the Fairplex act as anchor customers for an expansion of recycled water distribution to the north part of Pomona. For operation of this segment, the City must install VFDs at the existing Pomona WRP pump station since this segment will require any supply flow that is currently not utilized due to fixed speed pump operation. As shown in Figure 7.3, the following additional facilities are recommended for this segment:

- Zone 3 Pump Station - 3 fixed speed pumps (2 duty and 1 standby), 75 hp each
- North Reservoir 1 - 600,000 gallon tank
- North Booster Pump Station - 3 VFD pumps (2 duty and 1 standby), 30 hp each

As shown in Figure 7.4, this segment would be located in pressure Zone 3. This segment requires The Zone 3 Pump Station to supply North Reservoir 1. North Reservoir 1 and the North Booster Pump Station are required to pressurize Zone 3 during distribution periods since Zone 3 is isolated from the existing system by Zone 2. Table 7.11 lists the system control assumptions used for sizing the facilities in Segment 3.

Table 7.11 Segment 3 - (Zone 3) System Control Assumptions
Recycled Water Master Plan
City of Pomona

Asset	Switch On	Off	Comments
Zone 3 PS	9:00 AM everyday	North Reservoir is full	Should not be running when the North Reservoir Pump Station is operating
North Booster PS	9:00 PM (Start of Irrigation Demand)	5:00 AM everyday (End of Irrigation Demand)	Should not be running when the Zone 3 Pump Station is operating

A summary of the required facilities and the approximate costs for Segment 3 is shown below in Table 7.12.

Table 7.12 Segment 3 - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost
29	Pomona Fairplex	0.19	103	100	12 inch	$50	$5,000
41	Ganesha Park	0.33	171	200	12 inch	$230	$46,000
46	Kiwanis Park	0.03	14	815	6 inch	$150	$122,250
E	10 & White	0.02	11	0	6 inch	$150	$-
	New Transmission Line			13,900	16 inch	$290	$4,031,000
	Total Demand	**0.52**	**271**			**Pipeline Total**	**$4,204,250**
						North Reservoir 1 (600,000 gal tank at $2/gal)	$1,200,000
						North Booster PS (3 pumps, 30 hp each at $6,500/hp)	$585,000
						Zone 3 PS (3 pumps, 75 hp each at $5,000/hp)	$1,125,000
						Construction Cost	**$7,114,250**
						30% Contingency	$2,134,275
						Subtotal	***$9,248,525***
						Mark-ups	$2,774,558
						Capital Cost	**$12,023,083**
						Cost/acre-ft	**$2,916[(1)]**

Notes:
(1) Assumes pipelines and other structures depreciate over 50 years and mechanical equipment depreciates over 20 years.

Summary

Hydraulic modeling verified that the City's existing system is capable of adequate performance under increased demands from Segments 1, 2, and 3. The cost for implementing Segment 3 is about $2,916/ac-ft.

7.3.4 Segment 4A - North Extension

Segment 4A is an expansion of the existing system to the area immediately north of the existing system. For operation of this segment, the City must install VFDs at the existing Pomona WRP pump station since this segment will require any supply flow that is currently not utilized due to fixed speed pump operation.

As shown in Figure 7.3, the following additional facilities are required for this segment:

- Zone 2 Pump Station - 3 VFD pumps (2 duty and 1 standby), 15 hp each
- Zone 3 Check Valve (If Segment 3 has been implemented)

As shown in Figure 7.4, this segment would be located in Pressure Zone 2. This segment requires the Zone 2 Pump Station to supply the segment with recycled water from Zone 1. The Zone 2 PS could be located at the same site as the Zone 3 PS. The reservoirs of the existing City system (Zone 1) have sufficient capacity making an additional reservoir for this segment unnecessary. Zone 2 is isolated from Zone 3 by a check valve since Zone 3 is at a much higher pressure during operation. Table 7.13 lists the system control assumptions used for sizing Segment 4A facilities.

Table 7.13 Segment 4A - (Zone 2) System Control Assumptions
Recycled Water Master Plan
City of Pomona

Asset	Switch On	Off	Comments
Zone 2 PS	9:00 PM (Start of Irrigation Demand)	5:00 AM (End of Irrigation Demand)	Should be set to start when irrigation occurs

A summary of the required facilities and the approximate costs for Segment 4A is shown in Table 7.14.

Table 7.14 Segment 4A - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost
75	John Marshall Middle	0.05	25	200	4 inch	$130	$26,000
44	John F. Kennedy Park	0.04	23	200	4 inch	$130	$26,000
71	Ganesha Senior High	0.06	32	200	4 inch	$130	$26,000
B	10 & Fairplex	0.02	11	1,500	2 inch	$130	$195,000
65	Arroyo Elementary	0.02	10	1,200	4 inch	$130	$156,000
	New Transmission Line			1,900	6 inch	$150	$285,000
	New Transmission Line			2,677	8 inch	$180	$481,860
18	Village Gate	0.00	1	800	2 inch	$130	$104,000
A	10 & Dudley	0.02	11	900	4 inch	$130	$117,000
66	Cortez Elementary	0.01	7	500	4 inch	$130	$65,000
	New Transmission Line			2,450	4 inch	$130	$318,500
	Total Demand	**0.18**	**105**			**Pipeline Total**	**$1,800,360**
						Zone 2 PS (3 pumps, 15 hp each at $6,500/hp)	$292,500
						Construction Cost	**$2,092,860**
						30% Contingency	$627,858
						Subtotal	***$2,720,718***
						Mark-ups	$816,215
						Capital Cost	**$3,536,933**
						Cost/acre-ft	**$1,894[(1)]**

Notes:
(1) Assumes pipelines and other structures depreciate over 50 years and mechanical equipment depreciates over 20 years.

Summary

Hydraulic modeling verified that the City's existing system is capable of adequate performance under increased demands from Segments 1, 2, 3, and 4A. The cost for implementing Segment 4A is about $1,894/ac-ft.

7.3.5 Segment 4B - Segment 4B: Park West Extension

Segment 4B extends the existing system from Segment 3 in order to supply customers between Ganesha Park and Park West High School. For operation of this segment, the City

must install VFDs at the existing PWRP pump station since this segment will require any supply flow that is currently not utilized due to fixed speed pump operation.

The following additional facilities are required for this segment:

- North Reservoir 2 - 500,000 gallon tank
- Two Additional Pump at North Booster PS - 2 VFD pumps, 30 hp each

The segment is essentially an expansion of Zone 3. For this reason, an additional reservoir is required because recycled water is transferred to the reservoirs during the day by the Zone 3 PS for nighttime distribution by the North Booster PS. The Zone 3 PS does not need to be upgraded since it will be adequately sized in Segment 3. See Table 7.13 for a summary of Zone 3 system control assumptions.

A summary of the required facilities and the approximate costs for Segment 4B is shown in Table 7.15.

Table 7.15 Segment 4B - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost
C	10 & Garey	0.02	11	0	4 inch	$130	$-
30	Pomona Valley Hospital MC	0.03	14	200	4 inch	$130	$26,000
93	San Jose Elementary	0.02	12	550	4 inch	$130	$71,500
99	Yorba Elementary	0.02	11	550	4 inch	$130	$71,500
D	10 & Towne	0.02	11	0	4 inch	$130	$-
	New Transmission Line			11,500	12 inch	$230	$2,645,000
58	Ted Greene Park	0.02	12	200	4 inch	$130	$26,000
83	Palomares Middle	0.10	52	200	4 inch	$130	$26,000
52	Palomares Park	0.10	50	1,400	6 inch	$150	$210,000
87	Pomona Senior High	0.11	57	700	4 inch	$130	$91,000
	New Transmission Line			1,828	8 inch	$180	$329,040
	Total Demand	0.44	231			**Pipeline Total**	**$3,496,040**
						Reservoir Cost (500,000 gal tank at $2/gal)	$ 1,000,000
						Additional Pumps at North Booster PS (2 pumps 30 hp each $3,000/hp)	$180,000
						Construction Cost	**$4,676,040**

30% Contingency	$1,402,812
Subtotal	**$6,078,852**
Mark-ups	$1,823,656
Capital Cost	**$7,902,508**
Cost/acre-ft	**$2,183[(1)]**

Notes:

(1) Assumes pipelines and other structures depreciate over 50 years and mechanical equipment depreciates over 20 years.

Summary

Hydraulic modeling verified that the City's existing system is capable of adequate performance under increased demands from Segments 1, 2, 3, 4A, and 4B assuming that demand is not saturated from the previous segments or that the Pomona WRP can provide sufficient supplies. The cost for implementing Segment 4B is about $2,183/ac-ft.

7.3.6 Segment 5 - East Side Expansion

Using the IEUA as a secondary supply source, this segment extends recycled water service to the east side of the City. Braun Linens acts as an anchor customer for the segment. The following assumptions were made for the IEUA supply:

- IEUA recycled water supply is 1.3 mgd (1,500 ac-ft/yr).
- Recycled water is delivered at a constant flow rate from the IEUA.
- Delivery pressure at the end of San Antonio pipeline, 2.5 miles east from the City boundary, is 70 psi.

As shown in Figure 7.3, the following facilities are required for this segment.

- Zone 5 Pressure Reducing Valve
- Extension of the San Antonio Pipeline to the City boundary.

As shown in Figure 7.4, most of the Segment would be located in pressure Zone 4 except for Braun Linens, which is located in Zone 5. Table 7.16 summarizes the segment and the associated costs. The major cost associated with this segment is the over 2.5 miles of 16-inch diameter pipe required to connect the San Antonio pipeline to the City.

Table 7.16 Segment 5 - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost
51	Montvue Park	0.02	13	3000	4 inch	$130	$390,000
82	Montvue Elementary	0.02	8	0	4 inch	$130	$-
76	Kingsley Elementary	0.03	16	150	4 inch	$130	$19,500
92	San Antonio Elementary	0.03	14	150	4 inch	$130	$19,500
69	Emerson Middle	0.04	22	150	4 inch	$130	$19,500
47	Lincoln Park	0.02	9	1068	4 inch	$130	$138,840
42	Garfield Park	0.02	9	150	4 inch	$130	$19,500
89	Pueblo Elementary	0.03	17	3000	4 inch	$130	$390,000
96	Village Academy (HS)	0.00	1	0	4 inch	$130	$-
20	Braun Linen Service	0.45	315	986	8 inch	$180	$177,480
	New Transmission Line			16,500	12 inch	$230	$3,795,000
	New Transmission Line			14,000	16 inch	$290	$4,060,000
	Total Demand	**0.66**	**423**			**Pipeline Total**	**$9,029,320**
						30% Contingency	$2,708,796
						Subtotal	***$11,738,116***
						Mark-ups	$3,521,435
						Capital Cost	**$15,259,551**
						Cost/acre-ft	**$2,291[(1)]**

Notes:

(1) Assumes pipelines and other structures depreciate over 50 years and mechanical equipment depreciates over 20 years.

Summary

Hydraulic modeling verified that the existing pressure from the IEUA San Antonio Line is sufficient for pressurizing Segment 5. The cost for implementing Segment 5 is about $2,291/ac-ft. The City could discuss cost sharing with IEUA for the cost of the pipeline that extends the San Antonio pipeline to the City boundary. This would lower the overall segment cost.

7.3.7 Segment 6 - East Side Extension to Garey High

This segment maximizes use of the IEUA supply by extending the initial east side extension to Garey Senior High School. For this segment, Garey High School, Pomona Cemetery, and Freemont Middle School act as an anchor customers.. The following assumptions were made for the IEUA supply:

- IEUA recycled water supply is 1.3 mgd (1,500 ac-ft/yr).
- Recycled water is delivered at constant rate from the IEUA.
- Delivery pressure at the end of San Antonio pipeline, 2.5 miles east from the City boundary, is 70 psi.

As shown in Figure 7.3, the following additional facilities are required for this segment:

- East Reservoir - 600,000 gallon tank
- East Booster Pump Station - 3 VFD pumps (2 duty and 1 standby), 25 hp each

As shown in Figure 7.4 the Segment is entirely in located Pressure Zone 5. This segment will increase the amount of nighttime irrigation. Since the IEUA is assumed to supply recycled water at a constant flowrate throughout the day, a reservoir and pump station are required to store daytime flow for nighttime distribution. Table 7.17 lists the system control assumptions used to size this pump station.

Table 7.17 Segment 6 - (Zone 5) System Control Assumptions
Recycled Water Master Plan
City of Pomona

Asset	Switch On	Off	Comments
East Booster PS	Start of Irrigation Demand	End of Irrigation Demand	Should be timed to start when irrigation occurs

A summary of the required facilities and the approximate costs for Segment 6 is shown in Table 7.18.

Summary

Hydraulic modeling verified that the 1.3 mgd flow rate from the IEUA is sufficient to meet the demand from Segments 5 and 6 provided that a reservoir and pump station are installed. The cost for implementing Segment 6 is about $1,729/ac-ft.

Table 7.18 Segment 6 - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost
23	California Acrylic Industries	0.04	31	1,930	4 inch	$130	$251,030
31	Recycled Wood Products	0.04	26	804	4 inch	$130	$104,520
60	Washington Park	0.08	40	200	4 inch	$130	$26,000
63	Alcott Elementary	0.02	12	200	4 inch	$130	$26,000
94	Simons Middle	0.05	26	200	4 inch	$130	$26,000
9	Pomona Cemetery	0.19	100	200	8 inch	$180	$36,000
72	Garey Senior High	0.11	56	200	6 inch	$150	$30,000
70	Fremont Middle	0.07	36	200	6 inch	$150	$30,000
	New Transmission Line			12,000	12 inch	$230	$2,760,000
50	MLK Jr Memorial Park	0.03	14	1,200	4 inch	$130	$156,000
77	Lexington Elementary	0.02	11	450	4 inch	$130	$58,500
L	71 & Rio Rancho Rd.	0.02	11	1,000	4 inch	$130	$130,000
	New Transmission Line			2,600	8 inch	$180	$468,000
	Total Demand	**0.66**	**363**			**Pipeline Total**	**$4,102,050**
						Reservoir (600,000 gal tank at $2/gal)	$1,200,000
						Pump Station (3 pumps, 25 hp each at $6,500/hp)	$487,500
						Construction Cost	$5,789,550
						30% Contingency	$1,736,865
						Subtotal	***$7,526,415***
						Mark-ups	$2,257,925
						Capital Cost	**$9,784,340**
						Cost/acre-ft	**$1,729[(1)]**

Notes:
(1) Assumes pipelines and other structures depreciate over 50 years and mechanical equipment depreciates over 20 years.

7.3.8 Segment 7 - East Side/Existing System Connection

This segment extends service from Segment 6 to additional customers while also connecting the east side system to the City's existing system. The supply for this segment would be the IEUA. The following assumptions were made for the supply:

- Supply is not saturated from the implementation of Segments 5 and 6 or
- Supply from the IEUA has increased beyond 1.3 mgd (1,500 ac-ft/yr).

The following additional facilities are required for this segment:

- Additional Pump at East Booster Pump Station - 1 VFD, 25 hp pump

The segment is essentially an expansion of Zone 5. For this reason, an additional pump is required because this segment increases demand at night and the IEUA is only assumed to supply recycled water at a constant flow rate. See Table 7.17 for a summary of how Zone 5 operates. This segment also provides the additional benefit of connecting the existing system to the eastside recycled water users.

A summary of the required facilities and the approximate costs for Segment 7 are shown below in Table 7.19.

Table 7.19 Segment 7 - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost
80	Madison Elementary	0.02	8	1,000	4 inch	$130	$130,000
48	Madison Park	0.02	11	200	4 inch	$130	$26,000
95	Vejar Elementary	0.02	13	552	4 inch	$130	$71,760
79	Lopez Elementary	0.01	7	1,000	2 inch	$130	$130,000
81	Mendoza Elementary	0.01	5	503	24 inch	$130	$65,390
57	Ralph Welch Park	0.05	29	522	4 inch	$130	$67,860
88	Pomona Vocational	0.01	4	385	4 inch	$130	$50,050
84	Park West High	0.01	3	761	4 inch	$130	$98,930
12	Estates-Pomona Westland	0.00	1	433	4 inch	$130	$56,290
	New Transmission Line			12,500	12 inch	$230	$2,875,000
	Total Demand	**0.16**	**82**			**Pipeline Total**	**$3,571,280**
				Additional Pump (1 pump 25 hp at $3,000/hp)			$75,000
						Construction Cost	$3,646,280
						30% Contingency	$1,093,884
						Subtotal	***$4,740,164***
						Mark-ups	$1,422,049
						Capital Cost	**$6,162,213**
						Cost/acre-ft	**$4,797(1)**

Notes:
(1) Assumes pipelines and other structures depreciate over 50 years and mechanical equipment depreciates over 20 years.

Summary

This Segment can be implemented if additional supply is available from IEUA beyond 1.3 mgd (1,500 ac-ft/yr). Even though this segment would make a connection with the existing system, the cost is very high at $4,797/ac-ft due to limited demand.

7.3.9 Segment 8 - East Side Extension to Route 60

This segment extends service from Segment 6 to additional customers adjacent to State Route (SR) 60. This segment would be supplied from the IEUA. Similar to Segment 7, this segment is dependent on the following supply assumptions.

- Supply is not saturated from the implementation of Segments 5 and 6.
- Supply from the IEUA has increased beyond 1.3 mgd (1,500 ac-ft/yr).

The following additional facilities are required for this segment:

- Additional Pump at East Booster Pump Station

The segment is essentially an expansion of Zone 5. For this reason, an additional pump is required because this segment increases demand at night and the IEUA is only assumed to supply recycled water at a constant flow rate. See Table 7.17 for a summary of how Zone 5 operates.

A summary of the required facilities and the approximate costs for Segment 8 is shown below in Table 7.20.

Table 7.20 Segment 8 - Project Cost Estimate
Recycled Water Master Plan
City of Pomona

No.	Customer	MMD (mgd)	AAD (ac-ft/yr)	New Pipe (ft)	Pipe Dia. (in)	Unit Cost	Total Cost
85	Philadelphia Elementary	0.02	10	300	4 inch	$130	$39,000
53	Philadelphia Park	0.02	13	600	4 inch	$130	$78,000
73	Garey Village (HS)	0.03	14	350	4 inch	$130	$45,500
J	SR 71 & Garey Av	0.02	11	0	4 inch	$130	$-
I	SR 60 & Towne Av	0.02	11	2,600	4 inch	$130	$338,000
H	SR 60 & Reservoir Rd.	0.02	11	2,600	2 inch	$130	$338,000
	New Transmission Line			4,300	4 inch	$130	$559,000
	New Transmission Line			1,600	8 inch	$180	$288,000
	Total Demand	**0.14**	**71**			**Pipeline Total**	**$1,685,500**
						Additional Pump at East Booster Pump Station (1 pump 25 hp at $3,000/hp)	$75,000
						Construction Cost	**$1,760,500**
						30% Contingency	$528,150
						Subtotal	***$2,288,650***
						Mark-ups	$686,595

Capital Cost	**$2,975,245**
Cost/acre-ft	**$2,673[(1)]**

Notes:
(1) Assumes pipelines and other structures depreciate over 50 years and mechanical equipment depreciates over 20 years.

Summary

This Segment can be implemented if either supply is not saturated by Segments 5 and 6 or if the supply from the IEUA increases beyond 1.3 mgd. The estimated cost is $2,673/ac-ft.

7.3.10 SCADA Control and Monitoring

Table 7.21 shows the recommended controls for the each facility mentioned in the above segments.

Table 7.21 Recommended SCADA Monitoring and Control
Recycled Water Master Plan
City of Pomona

Facility	Control (Switch On)	Control (Switch Off)	Monitor
Zone 2 PS	Pressure Control	Pressure Control	Flow Rate
Zone 3 PS	Time Based Control	Level Control (Full)	Flow Rate
North Reservoirs	N/A	N/A	Reservoir Level
North Booster PS	Pressure Control	Pressure Control	Flow Rate
East Reservoir	N/A	N/A	Reservoir Level
East Booster PS	Pressure Control	Pressure Control	Flow Rate

7.3.11 Segment Summary

A brief description of the potential segments is listed below in Table 7.22 along with the associated cost.

Table 7.22 Segment Summary
Recycled Water Master Plan
City of Pomona

Facility	Description	Required Facilities	Potential MMD	Sement Cost/ac-ft
Segment 1	This segment focuses on the existing system. This segments includes connecting customers adjacent to the existing system and making modifications to existing customer systems, so that they may use more recycled water.	2 Pump Stations 2 Reservoirs	1.62 mgd(1)	$790
Segment 2	This segment extends the existing system south to Lanterman Hospital with a rehabilitated 12-inch water line.	None	0.18 mgd	$418
Segment 3	This segment extends the existing system to Ganesha Park and the Fairplex, which act as anchor customers.	2 Pump Stations 1 Reservoir	0.52 mgd	$2,916
Segment 4A	Segment 4A is an expansion of the existing system to the area immediately north of the existing system.	1 Pump Station	0.23 mgd	$1,894
Segment 4B	Segment 4B extends the existing system from Segment 3 in order to supply customers between Ganesha Park and Park West High School.	2 Additional Pump 1 Reservoir	0.44 mgd	$2,183
Segment 5	Using the IEUA as a supply source, this segment extends recycled water service to the east side of the City. Braun Linens acts as an anchor customer for the segment.	None	0.66 mgd	$2,291
Segment 6	This segment maximizes use of the IEUA supply by extending the initial east side extension to a Garey Senior High School.	1 Pump Station 1 Reservoir	0.67 mgd	$1,729
Segment 7	If additional IEUA supply is available, this segment extends service from Segment 6 to additional customers while also connecting the east side system to the City's existing system.	1 Additional Pump	0.16 mgd	$4,797
Segment 8	If additional IEUA supply is available, this segment extends service from Segment 6 to additional customers adjacent to Route 60.	1 Additional Pump	0.14 mgd	$2,673

Notes:

(1) Demand that only occurs because of capital expenditure. Includes new customers and expanded use at Cal Poly and Forest Lawn.

7.3.12 Recommendations

The eight different segments were grouped to create four alternative sequences. Figure 7.6 shows a flow chart of each alternative. The majority of the sequences were determined by physical constraints, i.e. some segments require the construction of preceding segments. Such instances are visible in Figure 7.3. The alternatives differ in that they provide different sequences for segment orders that are not constrained. Alternatives 1 and 3 are recommended for implementation since they place priority on the most cost effective segments.

A demand weighted average cost is given for each alternative. This average alternative cost only includes segments that do not require an increase of supply from either the IEUA or the Pomona WRP. Based on this average cost, Alternative 1 is given priority over Alternative 3 since Alternative 1 has a lower average cost. Within these recommended alternatives segment projects may be implemented as time and budget constraints allow. Figure 7.7 shows the recommended system based on implementation of Alternatives 1 and 3.

ALTERNATIVE 1 (Cost Weighted Average $1,230/ac-ft. Does not include Segment 4B)

Existing System
Supply:
- PWRP: 6mgd
- Non Potable Wells: 1mgd
- Total: 7mgd

Demand:
- 4.2 mgd mmp

2.8 mgd Surplus →

Segment 1
Supply: 2.8 mgd
Additional Demand: 1.8 mgd
Cost: $790/ac-ft

1 mgd Surplus →

Segment 2
Supply: 1 mgd
Additional Demand: 0.18 mgd
Cost: $418/ac-ft

0.82 mgd Surplus →

INSTALL VFDS AT PWRP PS →

Segment 4A
Supply: 0.82 mgd
Additional Demand: 0.23 mgd
Cost: $1,894/ac-ft

0.59 mgd Surplus →

Segment 3
Supply: 0.59 mgd
Additional Demand: 0.52 mgd
Cost: $2,916/ac-ft

0.07 mgd Surplus →

ADDITIONAL SUPPLY FROM PWRP OR IEUA →

Segment 4B
Supply: TBD
Additional Demand: 0.44 mgd
Cost: $2,183/ac-ft

ALTERNATIVE 2 (Cost Weighted Average $1,230/ac-ft. Does not include Segment 4B)

Existing System
Supply:
- PWRP: 6mgd
- Non Potable Wells: 1mgd
- Total: 7mgd

Demand:
- 4.2 mgd mmp

2.8 mgd Surplus →

Segment 1
Supply: 2.8 mgd
Additional Demand: 1.8 mgd
Cost: $790/ac-ft

1 mgd Surplus →

Segment 2
Supply: 1 mgd
Additional Demand: 0.18 mgd
Cost: $418/ac-ft

0.82 mgd Surplus →

INSTALL VFDS AT PWRP PS →

Segment 3
Supply: 0.82 mgd
Additional Demand: 0.52 mgd
Cost: $2,916/ac-ft

0.30 mgd Surplus →

Segment 4A
Supply: 0.30 mgd
Additional Demand: 0.23 mgd
Cost: $1,894/ac-ft

0.07 mgd Surplus →

ADDITIONAL SUPPLY FROM PWRP OR IEUA →

Segment 4B
Supply: TBD
Additional Demand: 0.44 mgd
Cost: $2,183/ac-ft

ALTERNATIVE 3 (Cost Weighted Average $2,000/ac-ft. Does not include Segments 7 & 8)

IEUA System
Supply: 1.3 mgd (Provided at a flat rate)

1.3 mgd Surplus →

Segment 5
Supply: 1.3 mgd
Additional Demand: 0.66 mgd
Cost: $2,291/ac-ft

0.64 mgd Surplus →

Segment 6
Supply: 0.64 mgd
Additional Demand: 0.66 mgd
Cost: $1,729/ac-ft

0 mgd →

PWRP OR IEUA →

Segment 8
Supply: TBD
Additional Demand: 0.14 mgd
Cost: $2,673/ac-ft

Segment 7
Supply: TBD
Additional Demand: 0.16 mgd
Cost: $4,797/ac-ft

ALTERNATIVE 4 (Cost Weighted Average $2,000/ac-ft. Does not include Segments 7 & 8)

IEUA System
Supply: 1.3 mgd (Provided at a flat rate)

1.3 mgd Surplus →

Segment 5
Supply: 1.3 mgd
Additional Demand: 0.66 mgd
Cost: $2,291/ac-ft

0.64 mgd Surplus →

Segment 6
Supply: 0.64 mgd
Additional Demand: 0.66 mgd
Cost: $1,729/ac-ft

0 mgd →

PWRP OR IEUA →

Segment 7
Supply: TBD
Additional Demand: 0.16 mgd
Cost: $4,797/ac-ft

Segment 8
Supply: TBD
Additional Demand: 0.14 mgd
Cost: $2,673/ac-ft

START 2009

ALTERNATIVES RECYCLED WATER MASTER PLAN

FIGURE 7.6

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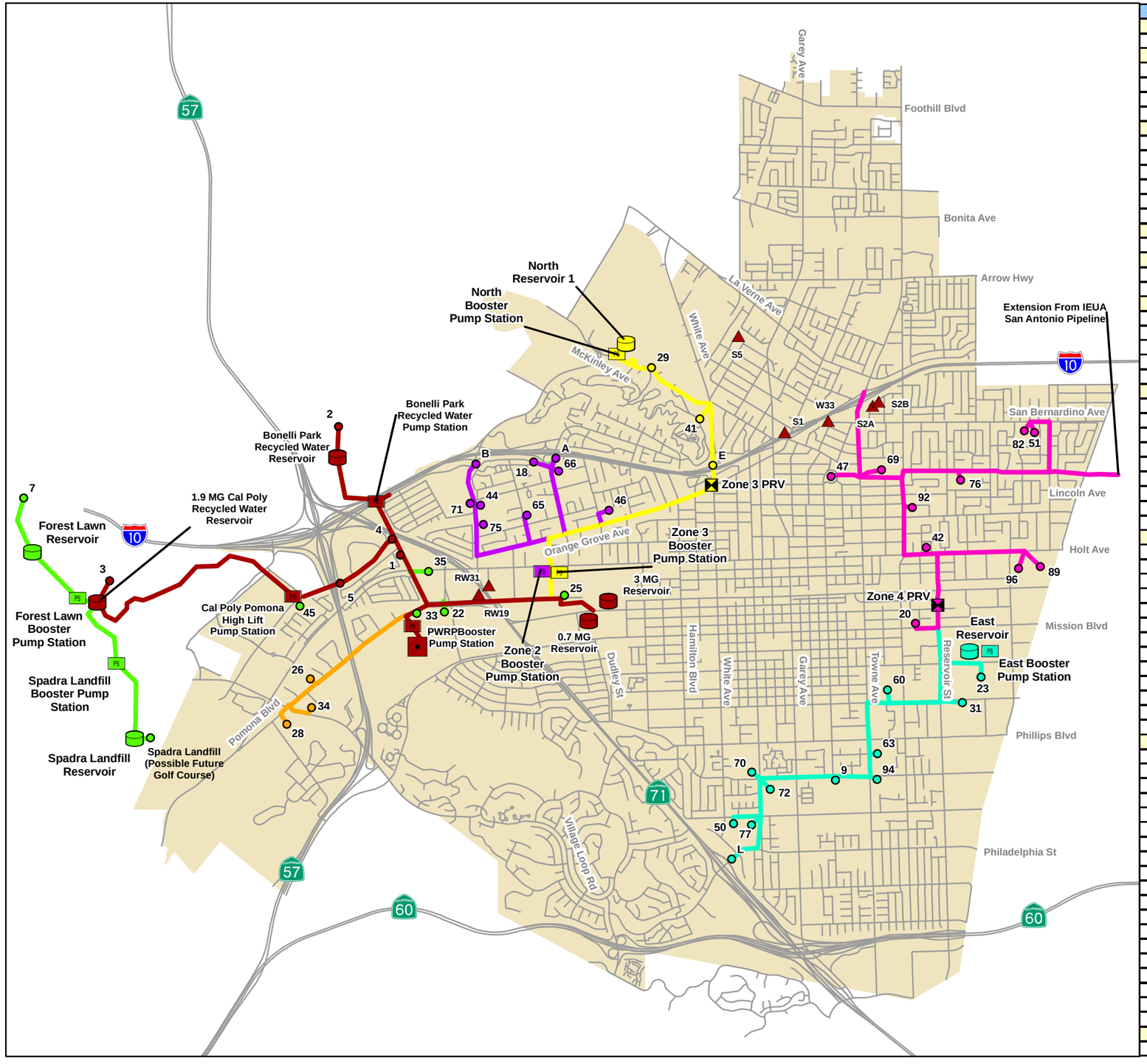

Site No.	Site Name		
Existing Customers			
1	City of Pomona Park Booster		
Existing Customers with Additional Supply Needs			
2	Bonelli Park/East Shore R.V. Park/Mountain Meadows Golf Course		
3	Cal Poly Pomona		
4	Caltrans SR-57 & South Campus Dr.		
5	Caltrans SR-71 & South Campus Dr.		
Caltrans Ramps with Potential Irrigation Demands			
A	I-10 & Dudley	G	SR-60 & Phillips Ranch Rd.
B	I-10 & Fairplex	H	SR-60 & Reservoir Rd.
C	I-10 & Garey	I	SR-60 & Towne
D	I-10 & Towne	J	SR-71 & Garey
E	I-10 & White	K	SR-71 & Mission
F	SR-57 & Temple	L	SR-71 & Rio Rancho Rd.
Potential Customers - Cities			
6	City of San Dimas - San Dimas Canyon G.C.		
Potential Customers - Cemeteries			
7	Forest Lawn Mortuary	9	Pomona Cemetery
8	Holy Cross Cemetery		
Potential Customers - Homeowners Associations			
10	Amcal Portofino Villas	15	Phillips Meadows
11	Country Pk Villas	16	Phillips Ranch
12	Estates-Pomona Westland	17	Quail Creek Pomona
13	Hermosa Village	18	Village Gate
14	Hidden Valley	19	Woodbridge PMA
Potential Customers - Industrial/Commercial			
20	Braun Linen Service	29	Pomona Fairplex
21	Angelica Textile Services	30	PVHMC
22	Brown Grandstands Inc	31	Recycled Wood Products
23	California Acrylic Industries	32	Ripon Cogeneration LLC
24	Congregational Homes	33	Robertson's Ready Mix
25	Ecoplast Corp	34	Structural Composites
26	Gemini Aluminum Corp	35	W R Meadows Inc
27	Hehr International	36	West Coast Recycling Srvcs
28	Lanterman Hospital		
Potential Customers - Parks			
37	Centennial Park	50	Mlk Jr Memorial Park
38	Cesar Chavez Park	51	Montvue Park
39	Civic Center	52	Palomares Park
40	Country Crossing Park	53	Philadelphia Park
41	Ganesha Park	54	Phillips Ranch Park
42	Garfield Park	55	Pomona Jaycee Park
43	Hamilton Park	56	Powers Park
44	John F. Kennedy Park	57	Ralph Welch Park
45	Kellogg Park	58	Ted Greene Park
46	Kiwanis Park	59	Veterans Park
47	Lincoln Park	60	Washington Park
48	Madison Park	61	Westmont Park
49	Memorial Park	62	Willie White Park
Potential Customers - Schools			
63	Alcott Elementary	82	Montvue Elementary
64	Allison Elementary	83	Palomares Middle
65	Arroyo Elementary	84	Park West High
66	Cortez Elementary	85	Philadelphia Elementary
67	Decker Elementary	86	Pomona Alternative (PAS)
68	Diamond Ranch Senior High	87	Pomona Senior High
69	Emerson Middle	88	Pomona Vocational
70	Fremont Middle	89	Pueblo Elementary
71	Ganesha Senior High	90	Ranch Hills Elementary
72	Garey Senior High	91	Roosevelt Elementary
73	Garey Village (HS)	92	San Antonio Elementary
74	Harrison Elementary	93	San Jose Elementary
75	John Marshall Middle	94	Simons Middle
76	Kingsley Elementary	95	Vejar Elementary
77	Lexington Elementary	96	Village Academy (HS)
78	Lincoln Elementary	97	Washington Elementary
79	Lopez Elementary	98	Westmont Elementary
80	Madison Elementary	99	Yorba Elementary
81	Mendoza Elementary		
Potential Customers - Specific Plans			
100	Downtown Specific Plan	101	Western University

Legend

- Water Reclamation Plant
- Non-Potable Well
- Booster Pump Station
- Reservoir
- PRV
- Existing or Potential Recycled Water Customer
- Pipeline
- Existing System
- Segment 1
- Segment 2
- Segment 3
- Segment 4A
- Segment 5
- Segment 6
- Streets
- City Limits/Service Area

Feet
0 3,000 6,000

Figure 7.7
Recommended System
Recycled Water Master Plan
City of Pomona

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Appendix A

EXAMPLE FIELD ASSESSMENT SHEET

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Facility / System Condition Assessment Form

Facility / System: Pomona Recycled Water System

Process / Basin / Zone: PWRP Pump Station

Component / Subbasin / Subzone: Small Booster C

Discipline: Mechanical / Electrical / Instrumentation / Piping

Current Year

Current ENR

Main Tab

Level of Service *	1	2	3	4	5	0			
Criticality									
Public Health & Safety	Multiple		Single		Seasonal		No Effect		
Environmental	Major			Minor			No Effect		
Cost of Repair	>$20			$5-$20			<$5		
Effect on Customers	Major			Minor			No Effect		
Vulnerability	1	2	3	5	10	20	50	100	150
Condition *	1	2	3	4	5	0			

Annual Maintenance Cost

Installation Year

Original Useful Life

Date of Inspection

Assessed By

Photo #

Acquisition Cost

Replacement Value

Salvage Value

Component Information Tab

ID Number

Manufacturer/Model (nameplate info)

Comments

Mechanical

Excessive vibration?	Yes	No	N/A
Excessive noise?	Yes	No	N/A
Excessive corrosion?	Yes	No	N/A
Excessive leaks?	Yes	No	N/A
Running hot?	Yes	No	N/A
Capable of running when inspected?	Yes	No	N/A
Support equipment functional?	Yes	No	N/A
Equipment or parts missing?	Yes	No	N/A
Parts for maintenance available?	Yes	No	N/A
Adequate for intended service?	Yes	No	N/A
Motor amps within rating?	Yes	No	N/A

Instrumentation

All critical indications functioning?	Yes	No	N/A
Alarms functional?	Yes	No	N/A
Equipment or parts missing?	Yes	No	N/A
Parts available for maintenance?	Yes	No	N/A

Electrical

Excessive corrosion?	Yes	No	N/A
Clean, well maintained contacts?	Yes	No	N/A
Parts available for maintenance?	Yes	No	N/A

Piping

Excessive corrosion?	Yes	No	N/A
Excessive leaks?	Yes	No	N/A
Paint in good condition?	Yes	No	N/A

*** Condition / Level of Service**

1 - Very Good

2 - Minor Defects

3 - Requires Significant Maintenance

4 - Requires Rehabilitation

5 - Requires Replacement (>50%)

0 - Non-Existent

Facility / System Condition Assessment Form

Facility / System:	Pomona Recycled Water System	Current Year	
Process / Basin / Zone:	PWRP Pump Station	Current ENR	
Component / Subbasin / Subzone:	Small Booster C		
Discipline:	Structural / Architectural		

Main Tab

Level of Service *		1		2		3		4		5	0
Criticality											
Public Health & Safety	Multiple		Single		Seasonal		No Effect				
Environmental	Major			Minor			No Effect				
Cost of Repair	>$20			$5-$20			<$5				
Effect on Customers	Major			Minor			No Effect				
Vulnerability	1	2	3	5	10	20	50	100	150		
Condition *	1		2		3		4		5	0	

Annual Maintenance Cost	
Installation Year	
Original Useful Life	
Date of Inspection	
Assessed By	
Photo #	
Acquisition Cost	
Replacement Value	
Salvage Value	

Component Information Tab

ID Number			
Manufacturer/Model (nameplate info)			
Comments			

Spalling concrete?	Yes	No	N/A
Excessive corrosion to structure?	Yes	No	N/A
Excessive corrosion to members?	Yes	No	N/A
Corrosion coating intact and in place?	Yes	No	N/A
Paint in good condition?	Yes	No	N/A
Visible structural deformaties?	Yes	No	N/A
Foundation settling evident?	Yes	No	N/A
Major cracks?	Yes	No	N/A

*** Condition / Level of Service**

1 - Very Good

2 - Minor Defects

3 - Requires Significant Maintenance

4 - Requires Rehabilitation

5 - Requires Replacement (>50%)

0 - Non-Existent

Facility / System Condition Assessment Form

Facility / System:	Pomona Recycled Water System	Current Year	
Process / Basin / Zone:	PWRP Pump Station	Current ENR	
Component / Subbasin / Subzone:	Small Booster C		
Discipline:	Civil / Sitework		

Main Tab

Level of Service *	1	2	3	4	5	0					
Criticality											
Public Health & Safety	Multiple		Single		Seasonal		No Effect				
Environmental	Major			Minor			No Effect				
Cost of Repair	>$20			$5-$20			<$5				
Effect on Customers	Major			Minor			No Effect				
Vulnerability	1	2	3	5	10	20	50	100	150		
Condition *	1	2	3	4	5	0					

Annual Maintenance Cost	
Installation Year	
Original Useful Life	
Date of Inspection	
Assessed By	
Photo #	
Acquisition Cost	
Replacement Value	
Salvage Value	

Component Information Tab

ID Number

Manufacturer/Model (nameplate info)

Comments

Sitework			
Several potholes?	Yes	No	N/A
Excessive erosion?	Yes	No	N/A
Severe road degradation evident?	Yes	No	N/A
Functional ground cover?	Yes	No	N/A
Fencing adequate and well maintained?	Yes	No	N/A
Facilities adequately secured?	Yes	No	N/A
Space for expansion?	Yes	No	N/A
Civil			
Presence of clay liner?	Yes	No	N/A
Excessive erosion on berm interior?	Yes	No	N/A
Excessive erosion on berm exterior?	Yes	No	N/A
Vegetation along berms?	Yes	No	N/A
Noticeable settlement of berms?	Yes	No	N/A
Presence of seepage on outer edge of berms?	Yes	No	N/A
Presence of burrow holes?	Yes	No	N/A
Presence of riprap or other erosion protection?	Yes	No	N/A
Adequate erosion protection?	Yes	No	N/A
Excessive algal blooms?	Yes	No	N/A
Adequate drainage?	Yes	No	N/A

*** Condition / Level of Service**

1 - Very Good

2 - Minor Defects

3 - Requires Significant Maintenance

4 - Requires Rehabilitation

5 - Requires Replacement (>50%)

0 - Non-Existent

Appendix I

FINANCIAL ANALYSIS DETAILS

This Appendix contains the following:

- Details of the financial analysis from Chapter 9, Section 9.7 in Tables I.1, I.2, and I.3 and a breakdown of the escalated prices and expenses in Table I.4.
- A breakdown by segment of the costs and demands for each phase in Table I.5.

The results for each of the three Chapter 9, Section 9.7 scenarios (best, worst, and average) are shown in Tables I.1, I.2 and I.3 respectively. A breakdown of the escalated prices and expenses used for each table is shown in Table I.4. Each table shows the following:

- Rows 1 -12: Provide the annual demand of recycled water. Row 9 displays the cumulative demand. *Rows 11- 12 provide a comparison of the cost of recycled water compared to the MWD rate*.
- Rows 13-15: Provide the operating revenues.
- Rows 16-19: Provide the operating expenses including O&M.
- Rows 20- 30: Provide total capital expenditure. The total capital expenditure for each phase is escalated to the midpoint of construction. The escalated cost is allocated to the years during which the phase is implemented (See Figure 9.6). This section also shows the funding for the capital expenditure including new loans or debt. The loan term and rate are shown in the far right column
- Rows 31-34: Provide the total debt service (payments). The debt service coverage ratio is included for each year.
- Rows 35 -40: Provide a tabulation of the cash flow for the recycled water utility.

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Table I.1 Financial Analysis, Best Case Scenario
Recycled Water Master Plan
City of Pomona

Row	Construction Phase		Phase I					Phase II						Phase III	
1	***Recycled Water Demand***	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**
2	Existing Customers (ac-ft)	2189	2200	2211	2222	2233	2244	2255	2266	2277	2288	2299	2310	2321	2332
3	Phase I (ac-ft)							982	982	982	982	982	982	982	982
4	Phase II (ac-ft)												74	74	74
5	Phase III (ac-ft)														
6	Phase IV (ac-ft)														
7	Phase V (ac-ft)														
8	Phase VI (ac-ft)														
9	Total Projected Yield (ac-ft)	2189	2200	2211	2222	2233	2244	3237	3248	3259	3270	3281	3366	3377	3388
10	Net Operating Expenses and Debt Service [1]	$368,714	$391,912	$416,775	$443,429	$472,011	$502,670	$781,420	$859,994	$942,158	$1,028,184	$1,118,365	$1,341,116	$1,424,046	$1,508,194
11	**Recycled W. Net Avg Cost ($/ac-ft/yr) [2]**	**$168**	**$178**	**$189**	**$200**	**$211**	**$224**	**$241**	**$265**	**$289**	**$314**	**$341**	**$398**	**$422**	**$445**
12	**Escalated MWD Tier 2 Rate ($/ac-ft/yr)**	**$1,000**	**$1,030**	**$1,061**	**$1,093**	**$1,126**	**$1,159**	**$1,194**	**$1,230**	**$1,267**	**$1,305**	**$1,344**	**$1,384**	**$1,426**	**$1,469**
13	***Operating Revenues***														
14	Revenue from Recycled Water Sales	$1,122,957	$1,179,387	$1,238,622	$1,300,799	$1,366,065	$1,434,570	$2,162,508	$2,267,501	$2,377,563	$2,492,939	$2,613,885	$2,802,274	$2,881,718	$2,963,382
15	**Total Operating Revenue**	$1,122,957	$1,179,387	$1,238,622	$1,300,799	$1,366,065	$1,434,570	$2,162,508	$2,267,501	$2,377,563	$2,492,939	$2,613,885	$2,802,274	$2,881,718	$2,963,382
16	***Operating Expenses***														
17	Rec. Wtr Purchases from LACSD	$240,790	$260,150	$281,060	$303,642	$328,031	$354,371	$549,523	$592,745	$639,359	$689,631	$743,847	$820,351	$847,723	$875,999
18	System O&M Costs	$127,924	$131,762	$135,715	$139,787	$143,980	$148,300	$219,862	$226,458	$233,252	$240,249	$247,457	$348,603	$359,061	$369,833
19	**Total Operating Expenses**	$368,714	$391,912	$416,775	$443,429	$472,011	$502,670	$769,385	$819,203	$872,611	$929,880	$991,304	$1,168,955	$1,206,785	$1,245,832
20	***Capital Expenditure***		**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase III**	**Phase III**	**Phase III**
21	**Total Capital Expenditure [3]**	$0	$438,968	$438,968	$438,968	$438,968	$438,968	$1,266,770	$1,266,770	$1,266,770	$1,266,770	$1,266,770	$1,987,928	$1,987,928	$1,987,928
22	Burea of Reclamation (25% of Construction Cost)	$0	$0	$0	$0	$0	$0	$316,693	$316,693	$316,693	$316,693	$316,693	$496,982	$496,982	$496,982
23	MWD - Local Resources Fund ($250 per acre foot rebate)	$0	$0	$0	$0	$0	$0	$31,500	$31,500	$31,500	$31,500	$31,500	$50,000	$50,000	$50,000
24	Unused- MWD - Local Res. Fund[4]	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
25	Wtr Recycling Funding Program (25% of Contruction Cost)	$0	$0	$0	$0	$0	$0	$316,693	$316,693	$316,693	$316,693	$316,693	$496,982	$496,982	$496,982
26	Pay as you go	$0	$438,968	$438,968	$438,968	$438,968	$438,968	$350,000	$0	$0	$0	$0	$0	$0	$0
27	Bond or Loan Funded	$0	$0	$0	$0	$0	$0	$251,885	$601,885	$601,885	$601,885	$601,885	$943,964	$943,964	$943,964
28	New SRF Debt (2.5%, 30 yrs)	$0	$0	$0	$0	$0	$0	$251,885	$601,885	$601,885	$601,885	$601,885	$943,964	$943,964	$943,964
29	New Debt (5% , 30 yrs)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
30	**New Debt Service**	$0	$0	$0	$0	$0	$0	$12,034	$28,757	$28,757	$28,757	$28,757	$45,100	$45,100	$45,100
31	***Debt Service***														
32	Total Debt Service	$0	$0	$0	$0	$0	$0	$12,034	$40,791	$69,548	$98,304	$127,061	$172,161	$217,262	$262,362
33	Net Income (Revenue-Expenses)	$754,243	$787,475	$821,847	$857,371	$894,053	$931,899	$1,393,123	$1,448,298	$1,504,952	$1,563,059	$1,622,581	$1,633,320	$1,674,934	$1,717,550
34	**Debt Service Coverage Ratio [5]**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**115.8**	**35.5**	**21.6**	**15.9**	**12.8**	**9.5**	**7.7**	**6.5**
35	***Available Cash***														
36	Cash Available after Debt Service	$754,243	$787,475	$821,847	$857,371	$894,053	$931,899	$1,381,088	$1,407,506	$1,435,405	$1,464,755	$1,495,520	$1,461,158	$1,457,672	$1,455,188
37	Pay as you go	$0	-$438,968	($438,968)	($438,968)	($438,968)	($438,968)	($350,000)	$0	$0	$0	$0	$0	$0	$0
38	General Fund Transfers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
39	**Fiscal Year Cash (Surplus or Shortfall)**	$754,243	$348,507	$382,879	$418,403	$455,085	$492,932	$1,031,088	$1,407,506	$1,435,405	$1,464,755	$1,495,520	$1,461,158	$1,457,672	$1,455,188
40	**Cumulative Available Cash**	$754,243	$1,102,749	$1,485,629	$1,904,031	$2,359,117	$2,852,048	$3,883,137	$5,290,643	$6,726,048	$8,190,803	$9,686,323	$11,147,482	$12,605,154	$14,060,342

Notes:
(1) Expenses paid on a yearly basis by the City for Recycled water. Includes debt service and O&M costs.
(2) Cost per acre-ft based on the total of net expenses and debt service. This should be compared to the cost of Tier 2 MWD water, shown in the row below.
(3) Cost of each phase is spread over the length of each phase as shown on Figure 8.5. The cost for each phase is esculated to the start of construction.
(4) MWD Local Resource Funding not allocated to a capital expenditure is accumulated in a fund for the next capital expenditure. This row represents that money spent from the account
(5) Ratio of incoming net revenue to outgoing expenses. This value typically needs to be above 1.1 for the City to issue a bond. Otherwise expenses exceed net revenue and investors will doubt the likelihood of being repaid.
(6) If the debt service coverage ratio is below 1, expenses exceed net revenue. General fund transfers are necessary for the City to meet financial obligations

Table I.1 Financial Analysis, Best Case Scenario

		Phase IV															
FY 2023	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**FY 2030**	**FY 2031**	**FY 2032**	**FY 2033**	**FY 2034**	**FY 2035**	**FY 2036**	**FY 2037**	**FY 2038**	**FY 2039**	**FY 2040**
2343	2354	2365	2376	2387	2398	2409	2420	2420	2420	2420	2420	2420	2420	2420	2420	2420	2420
982	982	982	982	982	982	982	982	982	982	982	982	982	982	982	982	982	982
74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
		172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172
							375	375	375	375	375	375	375	375	375	375	375
3399	3410	3593	3604	3615	3626	3637	4023	4023	4023	4023	4023	4023	4023	4023	4023	4023	4023
$1,593,599	$1,680,301	$1,997,013	$2,099,685	$2,203,983	$2,338,024	$2,473,795	$3,030,126	$3,101,016	$3,174,032	$3,249,239	$3,326,702	$3,406,489	$3,488,670	$3,573,316	$3,660,502	$3,750,303	$3,842,798
$469	**$493**	**$556**	**$583**	**$610**	**$645**	**$680**	**$753**	**$771**	**$789**	**$808**	**$827**	**$847**	**$867**	**$888**	**$910**	**$932**	**$955**
$1,513	**$1,558**	**$1,605**	**$1,653**	**$1,702**	**$1,754**	**$1,806**	**$1,860**	**$1,916**	**$1,974**	**$2,033**	**$2,094**	**$2,157**	**$2,221**	**$2,288**	**$2,357**	**$2,427**	**$2,500**
$3,047,329	$3,133,621	$3,384,333	$3,479,562	$3,577,436	$3,678,030	$3,781,418	$4,287,314	$4,394,496	$4,504,359	$4,616,968	$4,732,392	$4,850,702	$4,971,969	$5,096,269	$5,223,675	$5,354,267	$5,488,124
$3,047,329	$3,133,621	$3,384,333	$3,479,562	$3,577,436	$3,678,030	$3,781,418	$4,287,314	$4,394,496	$4,504,359	$4,616,968	$4,732,392	$4,850,702	$4,971,969	$5,096,269	$5,223,675	$5,354,267	$5,488,124
$905,209	$935,382	$1,015,147	$1,048,803	$1,083,564	$1,119,467	$1,156,549	$1,194,849	$1,230,694	$1,267,615	$1,305,643	$1,344,813	$1,385,157	$1,426,712	$1,469,513	$1,513,598	$1,559,006	$1,605,777
$380,928	$392,356	$577,615	$594,943	$612,791	$631,175	$650,110	$1,168,142	$1,203,187	$1,239,282	$1,276,461	$1,314,754	$1,354,197	$1,394,823	$1,436,668	$1,479,768	$1,524,161	$1,569,886
$1,286,137	$1,327,738	$1,592,762	$1,643,746	$1,696,355	$1,750,642	$1,806,659	$2,362,991	$2,433,881	$2,506,897	$2,582,104	$2,659,567	$2,739,354	$2,821,535	$2,906,181	$2,993,366	$3,083,167	$3,175,662
Phase III	**Phase III**	**Phase IV**	**Phase IV**	**Phase IV**	**Phase IV**	**Phase IV**											
$1,987,928	$1,987,928	$2,349,698	$2,349,698	$2,349,698	$2,349,698	$2,349,698	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$496,982	$496,982	$587,425	$587,425	$587,425	$587,425	$587,425	$0	$0	$0	$0	$0	$0	$0	$0	$0		
$50,000	$50,000	$93,000	$93,000	$93,000	$93,000	$93,000	$186,750	$186,750	$186,750	$186,750	$186,750	$186,750	$186,750	$186,750	$186,750	$186,750	$186,750
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$496,982	$496,982	$587,425	$587,425	$587,425	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$943,964	$943,964	$1,081,849	$1,081,849	$1,081,849	$1,669,274	$1,669,274		$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$943,964	$943,964	$1,081,849	$1,081,849	$1,081,849	$1,669,274	$1,669,274	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$45,100	$45,100	$51,688	$51,688	$51,688	$79,754	$79,754	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$307,463	$352,563	$404,251	$455,939	$507,628	$587,381	$667,135	$667,135	$667,135	$667,135	$667,135	$667,135	$667,135	$667,135	$667,135	$667,135	$667,135	$667,135
$1,761,192	$1,805,882	$1,791,571	$1,835,816	$1,881,081	$1,927,388	$1,974,758	$1,924,323	$1,960,616	$1,997,462	$2,034,864	$2,072,825	$2,111,348	$2,150,435	$2,190,088	$2,230,309	$2,271,100	$2,312,462
5.7	**5.1**	**4.4**	**4.0**	**3.7**	**3.3**	**3.0**	**2.9**	**2.9**	**3.0**	**3.1**	**3.1**	**3.2**	**3.2**	**3.3**	**3.3**	**3.4**	**3.5**
$1,453,730	$1,453,319	$1,387,320	$1,379,876	$1,373,453	$1,340,006	$1,307,623	$1,257,187	$1,293,480	$1,330,326	$1,367,728	$1,405,689	$1,444,212	$1,483,299	$1,522,952	$1,563,174	$1,603,965	$1,645,326
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$1,453,730	$1,453,319	$1,387,320	$1,379,876	$1,373,453	$1,340,006	$1,307,623	$1,257,187	$1,293,480	$1,330,326	$1,367,728	$1,405,689	$1,444,212	$1,483,299	$1,522,952	$1,563,174	$1,603,965	$1,645,326
$15,514,071	$16,967,391	$18,354,711	$19,734,587	$21,108,041	$22,448,047	$23,755,670	$25,012,857	$26,306,337	$27,636,664	$29,004,392	$30,410,082	$31,854,294	$33,337,593	$34,860,546	$36,423,719	$38,027,684	$39,673,010

Table I.2 Financial Analysis, Worst Case Scenario

Recycled Water Master Plan
City of Pomona

Row	Construction Phase		Phase I					Phase II					Phase III		
1	***Recycled Water Demand***	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**
2	Existing Customers (ac-ft)	2189	2200	2211	2222	2233	2244	2255	2266	2277	2288	2299	2310	2321	2332
3	Phase I (ac-ft)							982	982	982	982	982	982	982	982
4	Phase II (ac-ft)												74	74	74
5	Phase III (ac-ft)														
6	Phase IV (ac-ft)														
7	Phase V (ac-ft)														
8	Phase VI (ac-ft)														
9	Total Projected Yield (ac-ft)	2189	2200	2211	2222	2233	2244	3237	3248	3259	3270	3281	3366	3377	3388
10	Net Operating Expenses and Debt Service [1]	$368,714	$391,912	$416,775	$443,429	$472,011	$502,670	$851,791	$984,013	$1,119,826	$1,259,501	$1,403,330	$1,710,298	$1,877,446	$2,045,811
11	**Recycled W. Net Avg Cost ($/ac-ft/yr) [2]**	**$168**	**$178**	**$189**	**$200**	**$211**	**$224**	**$263**	**$303**	**$344**	**$385**	**$428**	**$508**	**$556**	**$604**
12	**Escalated MWD Tier 2 Rate ($/ac-ft/yr)**	**$1,000**	**$1,030**	**$1,061**	**$1,093**	**$1,126**	**$1,159**	**$1,194**	**$1,230**	**$1,267**	**$1,305**	**$1,344**	**$1,384**	**$1,426**	**$1,469**
13	***Operating Revenues***														
14	Revenue from Recycled Water Sales	$1,122,957	$1,179,387	$1,238,622	$1,300,799	$1,366,065	$1,434,570	$2,162,508	$2,267,501	$2,377,563	$2,492,939	$2,613,885	$2,802,274	$2,881,718	$2,963,382
15	**Total Operating Revenue**	$1,122,957	$1,179,387	$1,238,622	$1,300,799	$1,366,065	$1,434,570	$2,162,508	$2,267,501	$2,377,563	$2,492,939	$2,613,885	$2,802,274	$2,881,718	$2,963,382
16	***Operating Expenses***														
17	Rec. Wtr Purchases from LACSD	$240,790	$260,150	$281,060	$303,642	$328,031	$354,371	$549,523	$592,745	$639,359	$689,631	$743,847	$820,351	$847,723	$875,999
18	System O&M Costs	$127,924	$131,762	$135,715	$139,787	$143,980	$148,300	$219,862	$226,458	$233,252	$240,249	$247,457	$348,603	$359,061	$369,833
19	**Total Operating Expenses**	$368,714	$391,912	$416,775	$443,429	$472,011	$502,670	$769,385	$819,203	$872,611	$929,880	$991,304	$1,168,955	$1,206,785	$1,245,832
20	***Capital Expenditure***		**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase III**	**Phase III**	**Phase III**
21	**Total Capital Expenditure [3]**	$0	$438,968	$438,968	$438,968	$438,968	$438,968	$1,266,770	$1,266,770	$1,266,770	$1,266,770	$1,266,770	$1,987,928	$1,987,928	$1,987,928
22	Burea of Reclamation (25% of Construction Cost)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
23	MWD - Local Resources Fund ($250 per acre foot rebate)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
24	Unused- MWD - Local Res. Fund[4]	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
25	Wtr Recycling Funding Program (25% of Contruction Cost)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
26	Pay as you go	$0	$438,968	$438,968	$438,968	$438,968	$438,968	$0	$0	$0	$0	$0	$0	$0	$0
27	Bond or Loan Funded	$0	$0	$0	$0	$0	$0	$1,266,770	$1,266,770	$1,266,770	$1,266,770	$1,266,770	$1,987,928	$1,987,928	$1,987,928
28	New SRF Debt (2.5%, 30 yrs)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
29	New Debt (5% , 30 yrs)	$0	$0	$0	$0	$0	$0	$1,266,770	$1,266,770	$1,266,770	$1,266,770	$1,266,770	$1,987,928	$1,987,928	$1,987,928
30	**New Debt Service**	$0	$0	$0	$0	$0	$0	$82,405	$82,405	$82,405	$82,405	$82,405	$129,318	$129,318	$129,318
31	***Debt Service***														
32	Total Debt Service	$0	$0	$0	$0	$0	$0	$82,405	$164,810	$247,216	$329,621	$412,026	$541,344	$670,661	$799,979
33	Net Income (Revenue-Expenses)	$754,243	$787,475	$821,847	$857,371	$894,053	$931,899	$1,393,123	$1,448,298	$1,504,952	$1,563,059	$1,622,581	$1,633,320	$1,674,934	$1,717,550
34	**Debt Service Coverage Ratio [5]**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**16.9**	**8.8**	**6.1**	**4.7**	**3.9**	**3.0**	**2.5**	**2.1**
35	***Available Cash***														
36	Cash Available after Debt Service	$754,243	$787,475	$821,847	$857,371	$894,053	$931,899	$1,310,718	$1,283,487	$1,257,737	$1,233,439	$1,210,555	$1,091,976	$1,004,272	$917,571
37	Pay as you go	$0	($438,968)	($438,968)	($438,968)	($438,968)	($438,968)	$0	$0	$0	$0	$0	$0	$0	$0
38	General Fund Transfers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
39	**Fiscal Year Cash (Surplus or Shortfall)**	$754,243	$348,507	$382,879	$418,403	$455,085	$492,932	$1,310,718	$1,283,487	$1,257,737	$1,233,439	$1,210,555	$1,091,976	$1,004,272	$917,571
40	**Cumulative Available Cash**	$754,243	$1,102,749	$1,485,629	$1,904,031	$2,359,117	$2,852,048	$4,162,766	$5,446,253	$6,703,990	$7,937,429	$9,147,984	$10,239,960	$11,244,233	$12,161,804

Notes:
(1) Expenses paid on a yearly basis by the City for Recycled water. Includes debt service and O&M costs.
(2) Cost per acre-ft based on the total of net expenses and debt service. This should be compared to the cost of Tier 2 MWD water, shown in the row below.
(3) Cost of each phase is spread over the length of each phase as shown on Figure 8.5. The cost for each phase is esculated to the start of construction.
(4) MWD Local Resource Funding not allocated to a capital expenditure is accumulated in a fund for the next capital expenditure. This row represents that money spent from the account
(5) Ratio of incoming net revenue to outgoing expenses. This value typically needs to be above 1.1 for the City to issue a bond. Otherwise expenses exceed net revenue and investors will doubt the likelihood of being repaid.
(6) If the debt service coverage ratio is below 1, expenses exceed net revenue. General fund transfers are necessary for the City to meet financial obligations

Table I.2 Financial Analysis, Worst Case Scenario

		Phase IV															
FY 2023	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**FY 2030**	**FY 2031**	**FY 2032**	**FY 2033**	**FY 2034**	**FY 2035**	**FY 2036**	**FY 2037**	**FY 2038**	**FY 2039**	**FY 2040**
2343	2354	2365	2376	2387	2398	2409	2420	2420	2420	2420	2420	2420	2420	2420	2420	2420	2420
982	982	982	982	982	982	982	982	982	982	982	982	982	982	982	982	982	982
74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
		172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172
							375	375	375	375	375	375	375	375	375	375	375
3399	3410	3593	3604	3615	3626	3637	4023	4023	4023	4023	4023	4023	4023	4023	4023	4023	4023
$2,215,433	$2,386,352	$2,804,227	$3,008,062	$3,213,523	$3,420,661	$3,629,529	$4,185,861	$4,256,751	$4,329,767	$4,404,974	$4,482,437	$4,562,224	$4,644,405	$4,729,051	$4,816,236	$4,906,037	$4,998,532
$652	**$700**	**$780**	**$835**	**$889**	**$943**	**$998**	**$1,040**	**$1,058**	**$1,076**	**$1,095**	**$1,114**	**$1,134**	**$1,154**	**$1,176**	**$1,197**	**$1,219**	**$1,242**
$1,513	**$1,558**	**$1,605**	**$1,653**	**$1,702**	**$1,754**	**$1,806**	**$1,860**	**$1,916**	**$1,974**	**$2,033**	**$2,094**	**$2,157**	**$2,221**	**$2,288**	**$2,357**	**$2,427**	**$2,500**
$3,047,329	$3,133,621	$3,384,333	$3,479,562	$3,577,436	$3,678,030	$3,781,418	$4,287,314	$4,394,496	$4,504,359	$4,616,968	$4,732,392	$4,850,702	$4,971,969	$5,096,269	$5,223,675	$5,354,267	$5,488,124
$3,047,329	$3,133,621	$3,384,333	$3,479,562	$3,577,436	$3,678,030	$3,781,418	$4,287,314	$4,394,496	$4,504,359	$4,616,968	$4,732,392	$4,850,702	$4,971,969	$5,096,269	$5,223,675	$5,354,267	$5,488,124
$905,209	$935,382	$1,015,147	$1,048,803	$1,083,564	$1,119,467	$1,156,549	$1,194,849	$1,230,694	$1,267,615	$1,305,643	$1,344,813	$1,385,157	$1,426,712	$1,469,513	$1,513,598	$1,559,006	$1,605,777
$380,928	$392,356	$577,615	$594,943	$612,791	$631,175	$650,110	$1,168,142	$1,203,187	$1,239,282	$1,276,461	$1,314,754	$1,354,197	$1,394,823	$1,436,668	$1,479,768	$1,524,161	$1,569,886
$1,286,137	$1,327,738	$1,592,762	$1,643,746	$1,696,355	$1,750,642	$1,806,659	$2,362,991	$2,433,881	$2,506,897	$2,582,104	$2,659,567	$2,739,354	$2,821,535	$2,906,181	$2,993,366	$3,083,167	$3,175,662
Phase III	**Phase III**	**Phase IV**	**Phase IV**	**Phase IV**	**Phase IV**	**Phase IV**											
$1,987,928	$1,987,928	$2,349,698	$2,349,698	$2,349,698	$2,349,698	$2,349,698	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$1,987,928	$1,987,928	$2,349,698	$2,349,698	$2,349,698	$2,349,698	$2,349,698	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$1,987,928	$1,987,928	$2,349,698	$2,349,698	$2,349,698	$2,349,698	$2,349,698	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$129,318	$129,318	$152,851	$152,851	$152,851	$152,851	$152,851	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$929,296	$1,058,614	$1,211,465	$1,364,316	$1,517,168	$1,670,019	$1,822,870	$1,822,870	$1,822,870	$1,822,870	$1,822,870	$1,822,870	$1,822,870	$1,822,870	$1,822,870	$1,822,870	$1,822,870	$1,822,870
$1,761,192	$1,805,882	$1,791,571	$1,835,816	$1,881,081	$1,927,388	$1,974,758	$1,924,323	$1,960,616	$1,997,462	$2,034,864	$2,072,825	$2,111,348	$2,150,435	$2,190,088	$2,230,309	$2,271,100	$2,312,462
1.9	**1.7**	**1.5**	**1.3**	**1.2**	**1.2**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.1**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.3**
$831,896	$747,268	$580,106	$471,499	$363,913	$257,369	$151,888	$101,453	$137,746	$174,592	$211,994	$249,955	$288,478	$327,565	$367,218	$407,439	$448,230	$489,592
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$831,896	$747,268	$580,106	$471,499	$363,913	$257,369	$151,888	$101,453	$137,746	$174,592	$211,994	$249,955	$288,478	$327,565	$367,218	$407,439	$448,230	$489,592
$12,993,700	$13,740,968	$14,321,074	$14,792,574	$15,156,487	$15,413,856	$15,565,744	$15,667,197	$15,804,943	$15,979,534	$16,191,528	$16,441,483	$16,729,961	$17,057,525	$17,424,743	$17,832,182	$18,280,412	$18,770,003

Table I.3 Financial Analysis, Average Case Scenario
Recycled Water Master Plan
City of Pomona

Row	Construction Phase		Phase I					Phase II					Phase III		
1	***Recycled Water Demand***	**FY 2009**	**FY 2010**	**FY 2011**	**FY 2012**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**	**FY 2017**	**FY 2018**	**FY 2019**	**FY 2020**	**FY 2021**	**FY 2022**
2	Existing Customers (ac-ft)	2189	2200	2211	2222	2233	2244	2255	2266	2277	2288	2299	2310	2321	2332
3	Phase I (ac-ft)							982	982	982	982	982	982	982	982
4	Phase II (ac-ft)												74	74	74
5	Phase III (ac-ft)														
6	Phase IV (ac-ft)														
7	Phase V (ac-ft)														
8	Phase VI (ac-ft)														
9	Total Projected Yield (ac-ft)	2189	2200	2211	2222	2233	2244	3237	3248	3259	3270	3281	3366	3377	3388
10	Net Operating Expenses and Debt Service [1]	$368,714	$391,912	$416,775	$443,429	$472,011	$502,670	$793,805	$889,015	$987,815	$1,090,477	$1,197,293	$1,446,178	$1,555,242	$1,665,523
11	**Recycled W. Net Avg Cost ($/ac-ft/yr) [2]**	**$168**	**$178**	**$189**	**$200**	**$211**	**$224**	**$245**	**$274**	**$303**	**$333**	**$365**	**$430**	**$461**	**$492**
12	**Escalated MWD Tier 2 Rate ($/ac-ft/yr)**	**$1,000**	**$1,030**	**$1,061**	**$1,093**	**$1,126**	**$1,159**	**$1,194**	**$1,230**	**$1,267**	**$1,305**	**$1,344**	**$1,384**	**$1,426**	**$1,469**
13	***Operating Revenues***														
14	Revenue from Recycled Water Sales	$1,122,957	$1,179,387	$1,238,622	$1,300,799	$1,366,065	$1,434,570	$2,162,508	$2,267,501	$2,377,563	$2,492,939	$2,613,885	$2,802,274	$2,881,718	$2,963,382
15	**Total Operating Revenue**	$1,122,957	$1,179,387	$1,238,622	$1,300,799	$1,366,065	$1,434,570	$2,162,508	$2,267,501	$2,377,563	$2,492,939	$2,613,885	$2,802,274	$2,881,718	$2,963,382
16	***Operating Expenses***														
17	Rec. Wtr Purchases from LACSD	$240,790	$260,150	$281,060	$303,642	$328,031	$354,371	$549,523	$592,745	$639,359	$689,631	$743,847	$820,351	$847,723	$875,999
18	System O&M Costs	$127,924	$131,762	$135,715	$139,787	$143,980	$148,300	$219,862	$226,458	$233,252	$240,249	$247,457	$348,603	$359,061	$369,833
19	**Total Operating Expenses**	$368,714	$391,912	$416,775	$443,429	$472,011	$502,670	$769,385	$819,203	$872,611	$929,880	$991,304	$1,168,955	$1,206,785	$1,245,832
20	***Capital Expenditure***		**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase I**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase II**	**Phase III**	**Phase III**	**Phase III**
21	**Total Capital Expenditure [3]**	$0	$438,968	$438,968	$438,968	$438,968	$438,968	$1,266,770	$1,266,770	$1,266,770	$1,266,770	$1,266,770	$1,987,928	$1,987,928	$1,987,928
22	Burea of Reclamation (25% of Construction Cost)	$0	$0	$0	$0	$0	$0	$316,693	$316,693	$316,693	$316,693	$316,693	$496,982	$496,982	$496,982
23	MWD - Local Resources Fund ($250 per acre foot rebate)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
24	Unused- MWD - Local Res. Fund[4]	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
25	Wtr Recycling Funding Program (25% of Contruction Cost)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
26	Pay as you go	$0	$438,968	$438,968	$438,968	$438,968	$438,968	$438,968	$0	$0	$0	$0	$0	$0	$0
27	Bond or Loan Funded	$0	$0	$0	$0	$0	$0	$511,110	$950,078	$950,078	$950,078	$950,078	$1,490,946	$1,490,946	$1,490,946
28	New SRF Debt (2.5%, 30 yrs)	$0	$0	$0	$0	$0	$0	$511,110	$950,078	$950,078	$950,078	$950,078	$1,490,946	$1,490,946	$1,490,946
29	New Debt (5% , 30 yrs)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
30	**New Debt Service**	$0	$0	$0	$0	$0	$0	$24,420	$45,392	$45,392	$45,392	$45,392	$71,234	$71,234	$71,234
31	***Debt Service***														
32	Total Debt Service	$0	$0	$0	$0	$0	$0	$24,420	$69,812	$115,205	$160,597	$205,989	$277,223	$348,457	$419,691
33	Net Income (Revenue-Expenses)	$754,243	$787,475	$821,847	$857,371	$894,053	$931,899	$1,393,123	$1,448,298	$1,504,952	$1,563,059	$1,622,581	$1,633,320	$1,674,934	$1,717,550
34	**Debt Service Coverage Ratio [5]**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**N/A**	**57.0**	**20.7**	**13.1**	**9.7**	**7.9**	**5.9**	**4.8**	**4.1**
35	***Available Cash***														
36	Cash Available after Debt Service	$754,243	$787,475	$821,847	$857,371	$894,053	$931,899	$1,368,703	$1,378,486	$1,389,748	$1,402,462	$1,416,592	$1,356,097	$1,326,476	$1,297,859
37	Pay as you go	$0	-$438,968	($438,968)	($438,968)	($438,968)	($438,968)	($438,968)	$0	$0	$0	$0	$0	$0	$0
38	General Fund Transfers	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
39	**Fiscal Year Cash (Surplus or Shortfall)**	$754,243	$348,507	$382,879	$418,403	$455,085	$492,932	$929,735	$1,378,486	$1,389,748	$1,402,462	$1,416,592	$1,356,097	$1,326,476	$1,297,859
40	**Cumulative Available Cash**	$754,243	$1,102,749	$1,485,629	$1,904,031	$2,359,117	$2,852,048	$3,781,784	$5,160,269	$6,550,017	$7,952,480	$9,369,072	$10,725,168	$12,051,645	$13,349,504

Notes:
(1) Expenses paid on a yearly basis by the City for Recycled water. Includes debt service and O&M costs.
(2) Cost per acre-ft based on the total of net expenses and debt service. This should be compared to the cost of Tier 2 MWD water, shown in the row below.
(3) Cost of each phase is spread over the length of each phase as shown on Figure 8.5. The cost for each phase is esculated to the start of construction.
(4) MWD Local Resource Funding not allocated to a capital expenditure is accumulated in a fund for the next capital expenditure. This row represents that money spent from the account
(5) Ratio of incoming net revenue to outgoing expenses. This value typically needs to be above 1.1 for the City to issue a bond. Otherwise expenses exceed net revenue and investors will doubt the likelihood of being repaid.
(6) If the debt service coverage ratio is below 1, expenses exceed net revenue. General fund transfers are necessary for the City to meet financial obligations

Table I.3 Financial Analysis, Average Case Scenario

		Phase IV															
FY 2023	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**FY 2030**	**FY 2031**	**FY 2032**	**FY 2033**	**FY 2034**	**FY 2035**	**FY 2036**	**FY 2037**	**FY 2038**	**FY 2039**	**FY 2040**
2343	2354	2365	2376	2387	2398	2409	2420	2420	2420	2420	2420	2420	2420	2420	2420	2420	2420
982	982	982	982	982	982	982	982	982	982	982	982	982	982	982	982	982	982
74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74
		172	172	172	172	172	172	172	172	172	172	172	172	172	172	172	172
							375	375	375	375	375	375	375	375	375	375	375
3399	3410	3593	3604	3615	3626	3637	4023	4023	4023	4023	4023	4023	4023	4023	4023	4023	4023
$1,777,062	$1,889,897	$2,239,118	$2,374,299	$2,511,106	$2,649,590	$2,789,805	$3,346,136	$3,417,026	$3,490,042	$3,565,249	$3,642,712	$3,722,499	$3,804,680	$3,889,326	$3,976,511	$4,066,312	$4,158,807
$523	**$554**	**$623**	**$659**	**$695**	**$731**	**$767**	**$832**	**$849**	**$868**	**$886**	**$905**	**$925**	**$946**	**$967**	**$988**	**$1,011**	**$1,034**
$1,513	**$1,558**	**$1,605**	**$1,653**	**$1,702**	**$1,754**	**$1,806**	**$1,860**	**$1,916**	**$1,974**	**$2,033**	**$2,094**	**$2,157**	**$2,221**	**$2,288**	**$2,357**	**$2,427**	**$2,500**
$3,047,329	$3,133,621	$3,384,333	$3,479,562	$3,577,436	$3,678,030	$3,781,418	$4,287,314	$4,394,496	$4,504,359	$4,616,968	$4,732,392	$4,850,702	$4,971,969	$5,096,269	$5,223,675	$5,354,267	$5,488,124
$3,047,329	$3,133,621	$3,384,333	$3,479,562	$3,577,436	$3,678,030	$3,781,418	$4,287,314	$4,394,496	$4,504,359	$4,616,968	$4,732,392	$4,850,702	$4,971,969	$5,096,269	$5,223,675	$5,354,267	$5,488,124
$905,209	$935,382	$1,015,147	$1,048,803	$1,083,564	$1,119,467	$1,156,549	$1,194,849	$1,230,694	$1,267,615	$1,305,643	$1,344,813	$1,385,157	$1,426,712	$1,469,513	$1,513,598	$1,559,006	$1,605,777
$380,928	$392,356	$577,615	$594,943	$612,791	$631,175	$650,110	$1,168,142	$1,203,187	$1,239,282	$1,276,461	$1,314,754	$1,354,197	$1,394,823	$1,436,668	$1,479,768	$1,524,161	$1,569,886
$1,286,137	$1,327,738	$1,592,762	$1,643,746	$1,696,355	$1,750,642	$1,806,659	$2,362,991	$2,433,881	$2,506,897	$2,582,104	$2,659,567	$2,739,354	$2,821,535	$2,906,181	$2,993,366	$3,083,167	$3,175,662
Phase III	**Phase III**	**Phase IV**	**Phase IV**	**Phase IV**	**Phase IV**	**Phase IV**											
$1,987,928	$1,987,928	$2,349,698	$2,349,698	$2,349,698	$2,349,698	$2,349,698	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$496,982	$496,982	$587,425	$587,425	$587,425	$587,425	$587,425	$0	$0	$0	$0	$0	$0	$0	$0	$0		
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$1,490,946	$1,490,946	$1,762,274	$1,762,274	$1,762,274	$1,762,274	$1,762,274	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$1,490,946	$1,490,946	$1,762,274	$1,762,274	$1,762,274	$1,762,274	$1,762,274	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$71,234	$71,234	$84,197	$84,197	$84,197	$84,197	$84,197	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$490,925	$562,159	$646,356	$730,553	$814,751	$898,948	$983,145	$983,145	$983,145	$983,145	$983,145	$983,145	$983,145	$983,145	$983,145	$983,145	$983,145	$983,145
$1,761,192	$1,805,882	$1,791,571	$1,835,816	$1,881,081	$1,927,388	$1,974,758	$1,924,323	$1,960,616	$1,997,462	$2,034,864	$2,072,825	$2,111,348	$2,150,435	$2,190,088	$2,230,309	$2,271,100	$2,312,462
3.6	**3.2**	**2.8**	**2.5**	**2.3**	**2.1**	**2.0**	**2.0**	**2.0**	**2.0**	**2.1**	**2.1**	**2.1**	**2.2**	**2.2**	**2.3**	**2.3**	**2.4**
$1,270,267	$1,243,723	$1,145,215	$1,105,262	$1,066,330	$1,028,440	$991,613	$941,177	$977,471	$1,014,317	$1,051,719	$1,089,680	$1,128,202	$1,167,289	$1,206,943	$1,247,164	$1,287,955	$1,329,316
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
$0	$0	$0	$0	$0	$0	$0	$0	$0	$1	$2	$3	$4	$5	$6	$7	$8	$9
$1,270,267	$1,243,723	$1,145,215	$1,105,262	$1,066,330	$1,028,440	$991,613	$941,177	$977,471	$1,014,318	$1,051,721	$1,089,683	$1,128,206	$1,167,294	$1,206,949	$1,247,171	$1,287,963	$1,329,325
$14,619,771	$15,863,494	$17,008,709	$18,113,972	$19,180,302	$20,208,742	$21,200,355	$22,141,532	$23,119,003	$24,133,320	$25,185,041	$26,274,723	$27,402,930	$28,570,224	$29,777,173	$31,024,344	$32,312,306	$33,641,632

Table I.4 **Escalated Prices and Expenses**
Recycled Water Master Plan
City of Pomona

Escalation Sheet 1

Escalation Rates (2010 - 2020)	
Escalation Factor (Inflation, Consumer Price Index	3.00%
LACSD Recycled W. Cost Escalation	7.50%
City Recycled W. Charge Excalation	4.50%
Escalation Rates (2020 - 2040)	
Escalation Factor	3.00%
LACSD Recycled W. Cost Escalation	3.00%
City Recycled W. Charge Excalation	2.50%
Construction Escalation (Based on ENR)	
Construction Escalation (Based on ENR)	3.00%

Recycled Water Supply O&M	FY 2009	FY 2010	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022
Existing														
Power	$55,197	$56,853	$58,559	$60,315	$62,125	$63,989	$65,908	$67,886	$69,922	$72,020	$74,180	$76,406	$78,698	$81,059
Maintenance and Adm	$36,364	$37,455	$38,578	$39,736	$40,928	$42,155	$43,420	$44,723	$46,064	$47,446	$48,870	$50,336	$51,846	$53,401
Operation	$36,364	$37,455	$38,578	$39,736	$40,928	$42,155	$43,420	$44,723	$46,064	$47,446	$48,870	$50,336	$51,846	$53,401
Phase I														
Power	$22,116	$22,779	$23,463	$24,166	$24,891	$25,638	$26,407	$27,199	$28,015	$28,856	$29,722	$30,613	$31,532	$32,478
Maintenance and Adm	$17,045	$17,557	$18,084	$18,626	$19,185	$19,760	$20,353	$20,964	$21,593	$22,240	$22,908	$23,595	$24,303	$25,032
Operation	$17,045	$17,557	$18,084	$18,626	$19,185	$19,760	$20,353	$20,964	$21,593	$22,240	$22,908	$23,595	$24,303	$25,032
Phase II														
Power	$6,448	$6,641	$6,841	$7,046	$7,257	$7,475	$7,699	$7,930	$8,168	$8,413	$8,665	$8,925	$9,193	$9,469
Maintenance and Adm	$31,032	$31,963	$32,922	$33,910	$34,927	$35,975	$37,054	$38,166	$39,311	$40,490	$41,705	$42,956	$44,244	$45,572
Operation	$30,227	$31,134	$32,068	$33,030	$34,021	$35,042	$36,093	$37,176	$38,291	$39,440	$40,623	$41,842	$43,097	$44,390
Phase III														
Power	$39,930	$41,128	$42,362	$43,633	$44,942	$46,290	$47,679	$49,109	$50,582	$52,100	$53,663	$55,273	$56,931	$58,639
Maintenance and Adm	$34,091	$35,114	$36,167	$37,252	$38,370	$39,521	$40,706	$41,928	$43,185	$44,481	$45,815	$47,190	$48,605	$50,064
Operation	$34,091	$35,114	$36,167	$37,252	$38,370	$39,521	$40,706	$41,928	$43,185	$44,481	$45,815	$47,190	$48,605	$50,064
Phase IV														
Power	$8,893	$9,160	$9,434	$9,717	$10,009	$10,309	$10,619	$10,937	$11,265	$11,603	$11,951	$12,310	$12,679	$13,059
Maintenance and Adm	$129,545	$133,432	$137,435	$141,558	$145,805	$150,179	$154,684	$159,325	$164,104	$169,027	$174,098	$179,321	$184,701	$190,242
Operation	$129,545	$133,432	$137,435	$141,558	$145,805	$150,179	$154,684	$159,325	$164,104	$169,027	$174,098	$179,321	$184,701	$190,242
Phase V														
Power	$57,937	$59,675	$61,465	$63,309	$65,208	$67,164	$69,179	$71,255	$73,392	$75,594	$77,862	$80,198	$82,604	$85,082
Maintenance and Adm	$107,955	$111,193	$114,529	$117,965	$121,504	$125,149	$128,903	$132,770	$136,754	$140,856	$145,082	$149,434	$153,917	$158,535
Operation	$107,955	$111,193	$114,529	$117,965	$121,504	$125,149	$128,903	$132,770	$136,754	$140,856	$145,082	$149,434	$153,917	$158,535
Phase VI														
Power	$36,963	$38,072	$39,214	$40,391	$41,602	$42,850	$44,136	$45,460	$46,824	$48,228	$49,675	$51,165	$52,700	$54,281
Maintenance and Adm	$66,705	$68,706	$70,767	$72,890	$75,077	$77,329	$79,649	$82,038	$84,499	$87,034	$89,645	$92,335	$95,105	$97,958
Operation	$66,705	$68,706	$70,767	$72,890	$75,077	$77,329	$79,649	$82,038	$84,499	$87,034	$89,645	$92,335	$95,105	$97,958
Price Escalation														
MWD Tier 2 Rate	$1,000	$1,030	$1,061	$1,093	$1,126	$1,159	$1,194	$1,230	$1,267	$1,305	$1,344	$1,384	$1,426	$1,469
Price of Recycled From LACSD	$110	$118	$127	$137	$147	$158	$170	$182	$196	$211	$227	$244	$251	$259
City Recycled Water Charge	$513	$536	$560	$585	$612	$639	$668	$698	$730	$762	$797	$833	$853	$875
Number of Customers Connected	5	5	5	5	5	14	14	23	23	26	26	26	47	47

Table I.4 **Escalated Prices and Expenses**
Recycled Water Master Plan
City of Pomona

Escalation Sheet 2

FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	FY 2034	FY 2035	FY 2036	FY 2037	FY 2038	FY 2039	FY 2040
$83,491	$85,995	$88,575	$91,233	$93,970	$96,789	$99,692	$102,683	$105,764	$108,936	$112,205	$115,571	$119,038	$122,609	$126,287	$130,076	$133,978	$137,997
$55,003	$56,653	$58,353	$60,104	$61,907	$63,764	$65,677	$67,647	$69,676	$71,767	$73,920	$76,137	$78,422	$80,774	$83,197	$85,693	$88,264	$90,912
$55,003	$56,653	$58,353	$60,104	$61,907	$63,764	$65,677	$67,647	$69,676	$71,767	$73,920	$76,137	$78,422	$80,774	$83,197	$85,693	$88,264	$90,912
$33,452	$34,456	$35,489	$36,554	$37,650	$38,780	$39,943	$41,142	$42,376	$43,647	$44,957	$46,305	$47,694	$49,125	$50,599	$52,117	$53,681	$55,291
$25,783	$26,556	$27,353	$28,174	$29,019	$29,889	$30,786	$31,710	$32,661	$33,641	$34,650	$35,689	$36,760	$37,863	$38,999	$40,169	$41,374	$42,615
$25,783	$26,556	$27,353	$28,174	$29,019	$29,889	$30,786	$31,710	$32,661	$33,641	$34,650	$35,689	$36,760	$37,863	$38,999	$40,169	$41,374	$42,615
$9,753	$10,046	$10,347	$10,657	$10,977	$11,306	$11,646	$11,995	$12,355	$12,725	$13,107	$13,500	$13,905	$14,323	$14,752	$15,195	$15,651	$16,120
$46,939	$48,347	$49,798	$51,291	$52,830	$54,415	$56,048	$57,729	$59,461	$61,245	$63,082	$64,975	$66,924	$68,931	$70,999	$73,129	$75,323	$77,583
$45,721	$47,093	$48,506	$49,961	$51,460	$53,004	$54,594	$56,232	$57,919	$59,656	$61,446	$63,289	$65,188	$67,144	$69,158	$71,233	$73,370	$75,571
$60,398	$62,210	$64,076	$65,998	$67,978	$70,018	$72,118	$74,282	$76,510	$78,805	$81,170	$83,605	$86,113	$88,696	$91,357	$94,098	$96,921	$99,828
$51,566	$53,113	$54,706	$56,347	$58,037	$59,779	$61,572	$63,419	$65,322	$67,281	$69,300	$71,379	$73,520	$75,726	$77,998	$80,337	$82,748	$85,230
$51,566	$53,113	$54,706	$56,347	$58,037	$59,779	$61,572	$63,419	$65,322	$67,281	$69,300	$71,379	$73,520	$75,726	$77,998	$80,337	$82,748	$85,230
$13,451	$13,855	$14,270	$14,699	$15,140	$15,594	$16,062	$16,543	$17,040	$17,551	$18,077	$18,620	$19,178	$19,754	$20,346	$20,957	$21,585	$22,233
$195,949	$201,828	$207,882	$214,119	$220,542	$227,159	$233,974	$240,993	$248,222	$255,669	$263,339	$271,239	$279,377	$287,758	$296,391	$305,282	$314,441	$323,874
$195,949	$201,828	$207,882	$214,119	$220,542	$227,159	$233,974	$240,993	$248,222	$255,669	$263,339	$271,239	$279,377	$287,758	$296,391	$305,282	$314,441	$323,874
$87,634	$90,263	$92,971	$95,760	$98,633	$101,592	$104,640	$107,779	$111,013	$114,343	$117,773	$121,306	$124,946	$128,694	$132,555	$136,531	$140,627	$144,846
$163,291	$168,190	$173,235	$178,432	$183,785	$189,299	$194,978	$200,827	$206,852	$213,058	$219,449	$226,033	$232,814	$239,798	$246,992	$254,402	$262,034	$269,895
$163,291	$168,190	$173,235	$178,432	$183,785	$189,299	$194,978	$200,827	$206,852	$213,058	$219,449	$226,033	$232,814	$239,798	$246,992	$254,402	$262,034	$269,895
$55,910	$57,587	$59,315	$61,094	$62,927	$64,815	$66,759	$68,762	$70,825	$72,950	$75,138	$77,392	$79,714	$82,106	$84,569	$87,106	$89,719	$92,411
$100,897	$103,924	$107,041	$110,252	$113,560	$116,967	$120,476	$124,090	$127,813	$131,647	$135,597	$139,665	$143,854	$148,170	$152,615	$157,194	$161,909	$166,767
$100,897	$103,924	$107,041	$110,252	$113,560	$116,967	$120,476	$124,090	$127,813	$131,647	$135,597	$139,665	$143,854	$148,170	$152,615	$157,194	$161,909	$166,767
$1,513	$1,558	$1,605	$1,653	$1,702	$1,754	$1,806	$1,860	$1,916	$1,974	$2,033	$2,094	$2,157	$2,221	$2,288	$2,357	$2,427	$2,500
$266	$274	$283	$291	$300	$309	$318	$328	$337	$347	$358	$369	$380	$391	$403	$415	$427	$440
$897	$919	$942	$965	$990	$1,014	$1,040	$1,066	$1,092	$1,120	$1,148	$1,176	$1,206	$1,236	$1,267	$1,298	$1,331	$1,364
47	47	47	47	47	47	67	67	75	75	75	75	75	75	75	75	75	75

Table I.5 Breakdown of Costs and Demands for each Phase
Recycled Water Master Plan
City of Pomona

Breakdown by Segment	Phase I (2010-2015)	Phase II (2015-2020)	Phase III (2020-2025)	Phase IV (2025-2030)	Phase V (2030-2040)	Phase VI (2030-2050)
Segment 1						
Cost	$ 317,000					
Demand (afy)	868					
Cost $/AF [1]	$368					
Segment 7						
Cost	$ 1,691,589	$ 5,000,000	$ 3,268,411			
Demand (afy)	8	74	128			
Cost $/AF	$15,362	$4,909	$1,855			
Segment 9						
Cost			$ 3,500,000	$ 6,901,000		
Demand (afy)			44	375		
Cost $/AF			$5,779	$1,337		
Segment 5						
Cost					$ 16,133,000	
Demand (afy)					423	
Cost $/AF					$2,773	
Segment 6						
Cost					$ 7,907,500	
Demand (afy)					235	
Cost $/AF					$2,449	
Segment 4a						
Cost						$ 3,988,000
Demand (afy)						135
Cost $/AF						$2,144
Segment 3						
Cost						$ 11,884,500
Demand (afy)						282
Cost $/AF						$3,060
Segment 4b						
Cost						$ 7,658,000
Demand (afy)						230.9355
Cost $/AF						$2,409
Segment 8						
Cost						$ 3,181,000
Demand (afy)						71.0505
Cost $/AF						$3,253
Segment 2						
Cost						$ 1,311,500
Demand (afy)						107
Cost $/AF						$2,655 [2]
Total Cost	$ 2,008,589	$ 5,000,000	$ 6,768,411	$ 6,901,000	$ 24,040,500	$ 28,023,000
Total Demand (afy)	876	74	172	375	658	826
Total $/AF	$2,055 [1]	$4,909	$2,859	$1,337	$2,657	$2,696 [2]

Notes:

(1) The $/ac-ft represents the unit cost incurred by the City only. The cost of improvement project, what would be owned and operated by Cal Poly and Forest Lawn, are not included in this value.

(2) Based on a demand of 36 afy (excludes the 71 afy demand from Lanterman Hospital) and rehabilitation of an existing 12-inch main for recycled water transmission (see Chapter 8).

Appendix J

BREAKDOWN OF O&M COSTS

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Power Costs by Segment

Description	Existing Customers	Segment 1	Segment 2	Segment 3	Segment 4A	Segment 4B	Segment 5	Segment 6	Segment 7	Segment 8	Segment 9
Facility name	PWRP PS	PWRP PS	PWRP PS	PWRP PS	PWRP PS	PWRP PS	PWRP PS	East Res PS	PWRP PS	PWRP PS	PWRP PS
Existing Flow (gpm)	1500	536	65	174	83	143	262	435	130	45	260
Pressure (psi)	45	45	45	45	45	45	70	75	45	45	45
Efficiency	75%	75%	75%	75%	75%	75%	N/A	75%	75%	75%	75%
HP	53	19	2	6	3	5	N/A	25	5	2	9
kW	39	14	2	5	2	4	N/A	19	3	1	7
Time (hr)	24	24	24	24	24	24	9	8	24	24	24
Cost/Day	$151	$54	$7	$18	$8	$14	N/A	$24	$13	$5	$26
Cost/Year	$55,197	$19,724	$2,392	$6,403	$3,054	$5,262	N/A	$8,893	$4,784	$1,656	$9,568
Facility name				Zone 3 PS	Zone 2 PS	Zone 3 PS			Zone 5 PS	Zone 5 PS	Zone 5 PS
PWRP Pump Station				420	249	343			390	135	780
Segment 1 Flow				100	50	100			70	70	70
Pressure				75%	75%	75%			75%	75%	75%
Efficiency				33	10	27			21	7	42
HP				25	7	20			16	6	32
kW				16	8	16			8	8	8
Time				$63	$9	$51			$20	$7	$41
Cost/Day				$22,897	$3,394	$18,699			$7,441	$2,576	$14,883
Facility name				North Res PS		North Res PS					Zone 6 PS
Segment 2				520		520					780
PWRP Pump Station				75		75					100
Segment 2 Flow				75%		75%					75%
Pressure				30		30					61
Efficiency				23		23					46
HP				8		8					8
kW				$29		$29					$58
Time				$10,631		$10,631					$21,261

Power Cost by Phase

Phase	Cost
Existing Customers	$55,197
Phase I - Segments 1 and 2	$22,116
Phase II - Segment 4A	$6,448
Phase III - Segment 3	$39,930
Phase IV - Segments 5 and 6	$8,893
Phase V - Segments 7 and 9	$57,937
Phase VI - Segments 8 and 4B	$36,963
Total	**$227,483**

Maintenance & Administration Cost by Segment

Segment	Pipeline Length (ft)	Maintenance Cost ($/yr)	Administration Cost ($/yr)
Existing Customers	16,000	$ 28,788	$ 7,576
Segment 1	1,400	$ 2,519	$ 663
Segment 2	6,100	$ 10,975	$ 2,888
Segment 3	15,000	$ 26,989	$ 7,102
Segment 4A	13,300	$ 23,930	$ 6,297
Segment 4B	17,000	$ 30,587	$ 8,049
Segment 5	39,500	$ 71,070	$ 18,703
Segment 6	17,500	$ 31,487	$ 8,286
Segment 7	25,000	$ 44,981	$ 11,837
Segment 8	12,350	$ 22,221	$ 5,848
Segment 9	22,500	$ 40,483	$ 10,653
TOTAL	**185,650**	**$ 334,029**	**$ 87,902**

Maintenance & Administration Cost by Phase

Phase	Maintenance Cost ($/yr)	Administration Cost ($/yr)	Total Cost ($/yr)
Existing Customers	$ 28,788	$7,576	$ 36,364
Phase I - Segments 1 and 2	$ 13,494	$3,551	$ 17,045
Phase II - Segment 4A	$ 23,930	$7,102	$ 31,032
Phase III - Segment 3	$ 26,989	$7,102	$ 34,091
Phase IV - Segments 5 and 6	$ 102,557	$26,989	$ 129,545
Phase V - Segments 7 and 9	$ 85,464	$22,491	$ 107,955
Phase VI - Segments 8 and 4B	$ 52,808	$13,897	$ 66,705
TOTAL	**$ 334,029**	**$88,707**	**$ 422,737**

Operations Cost by Segment

Segment	Pipeline Length	FTE	Cost
Existing Customers	16,000	0.6	$36,364
Segment 1	1,400	0.1	$3,182
Segment 2	6,100	0.2	13,864
Segment 3	15,000	0.6	$34,091
Segment 4A	13,300	0.5	$30,227
Segment 4B	17,000	0.6	$38,636
Segment 5	39,500	1.5	$89,773
Segment 6	17,500	0.7	$39,773
Segment 7	25,000	0.9	$56,818
Segment 8	12,350	0.5	$28,068
Segment 9	22,500	0.9	$51,136
TOTAL	**185,650**	**7.0**	**421,932**

Operation Cost by Phase

Phase	FTE	Cost
Existing Customers	3.0	$36,364
Phase I - Segments 1 and 2	0.5	$17,045
Phase II - Segment 4A	0.5	$30,227
Phase III - Segment 3	0.6	$34,091
Phase IV - Segments 5 and 6	2.2	$129,545
Phase V - Segments 7 and 9	1.8	$107,955
Phase VI - Segments 8 and 4B	1.1	$66,705
TOTAL	**9.6**	**$421,932**