

Section 4 Recycled Water Use

4-1 Recycled Water Regulations

The use of recycled water is regulated through the California Code of Regulations (CCR). Pertinent excerpts from Titles 17 and 22 of the CCR statutes are compiled in the California Health Laws related to Recycled Water, also referred to as "The Purple Book", which was updated in June 2001.

The California recycled water regulations promote the use of recycled water to offset potable water supply needs. As discussed in Section 3, the water demand of the City is expected to increase which would increase the need for additional potable water supply sources. Recycled water is provided by the IEUA which treats its wastewater to tertiary treatment standards including disinfection at four regional wastewater reclamation plants. According to the Title 22, tertiary-treated recycled water can be used for the following:

- Irrigation at golf courses, cemeteries, residential landscaping, parks, and playgrounds
- Watering ornamental nursery stock, and non-edible and edible vegetation
- Recreational lakes and ponds, and water bodies for wildlife habitat
- Cooling towers, air conditioners, and evaporative condensers
- Flushing toilets, decorative fountains, commercial laundries, commercial car washes
- Industrial boiler and other process feed
- Washing down roads and sidewalks
- Fire fighting

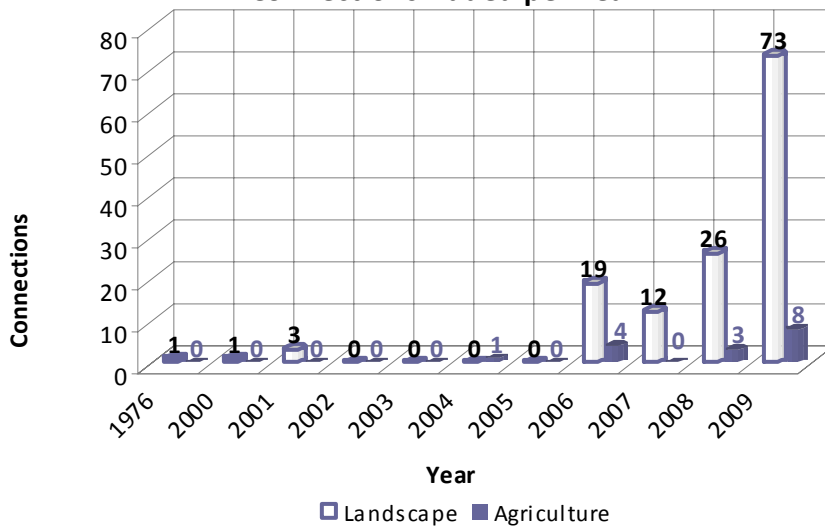
The California Water Code (Section 13550) states that potable domestic water use for non-potable demands is "a waste of water if recycled water is of adequate quality and is available for these (non-potable) uses and can be furnished at a reasonable cost to the user." In addition, recycled water can also be used if it "is not detrimental to public health and will not adversely affect downstream water rights, degrade water quality, or is not injurious to plant life, fish, and wildlife." Water quality and health effects pose major concerns to the public in regards to the use of this source. However, regulations and guidelines for recycled water have been established by the California Department of Public Health and are published in the CCR. These regulations and guidelines provide water utilities with requirements for treatment, water quality and reliability of the recycled water before public use.

4-2 Historic Recycled Water Use

Recycled Water has been available to the City since 1976 when the Whispering Lakes Golf Course was first connected to Recycled Water. However, it took nearly twenty-five years for the second connection to be made with a few connections made in the few years after that. It was not until recently that the City began actively pursuing existing potable customers to convert to Recycled Water. Figure 4-1 shows the Recycled Water connections made per year and Figure 4-2 shows the consumption of the connections.

Originally, customers primarily connected to Recycled Water landscape and agricultural uses, but recently a few connections have been made for industrial processes.

**Figure 4-1
Connections Added per Year**



**Figure 4-2
Total Consumption**

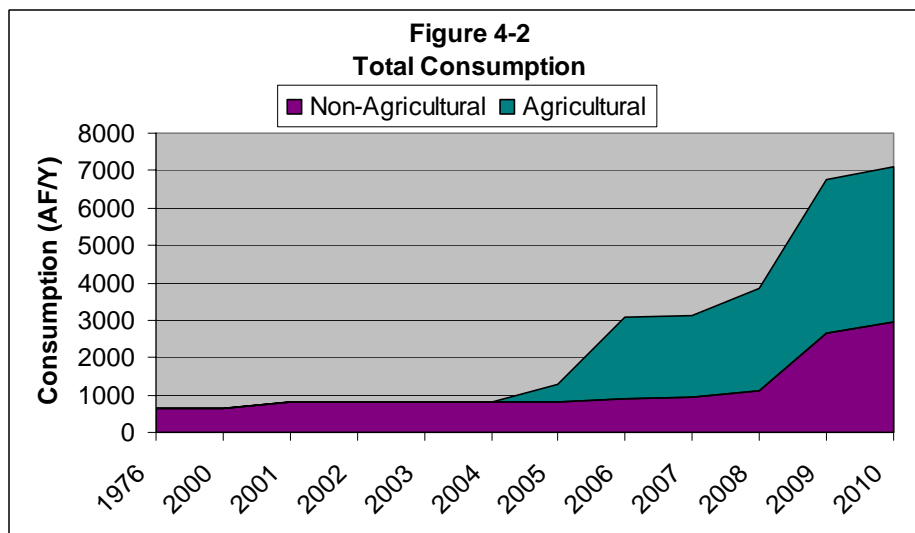
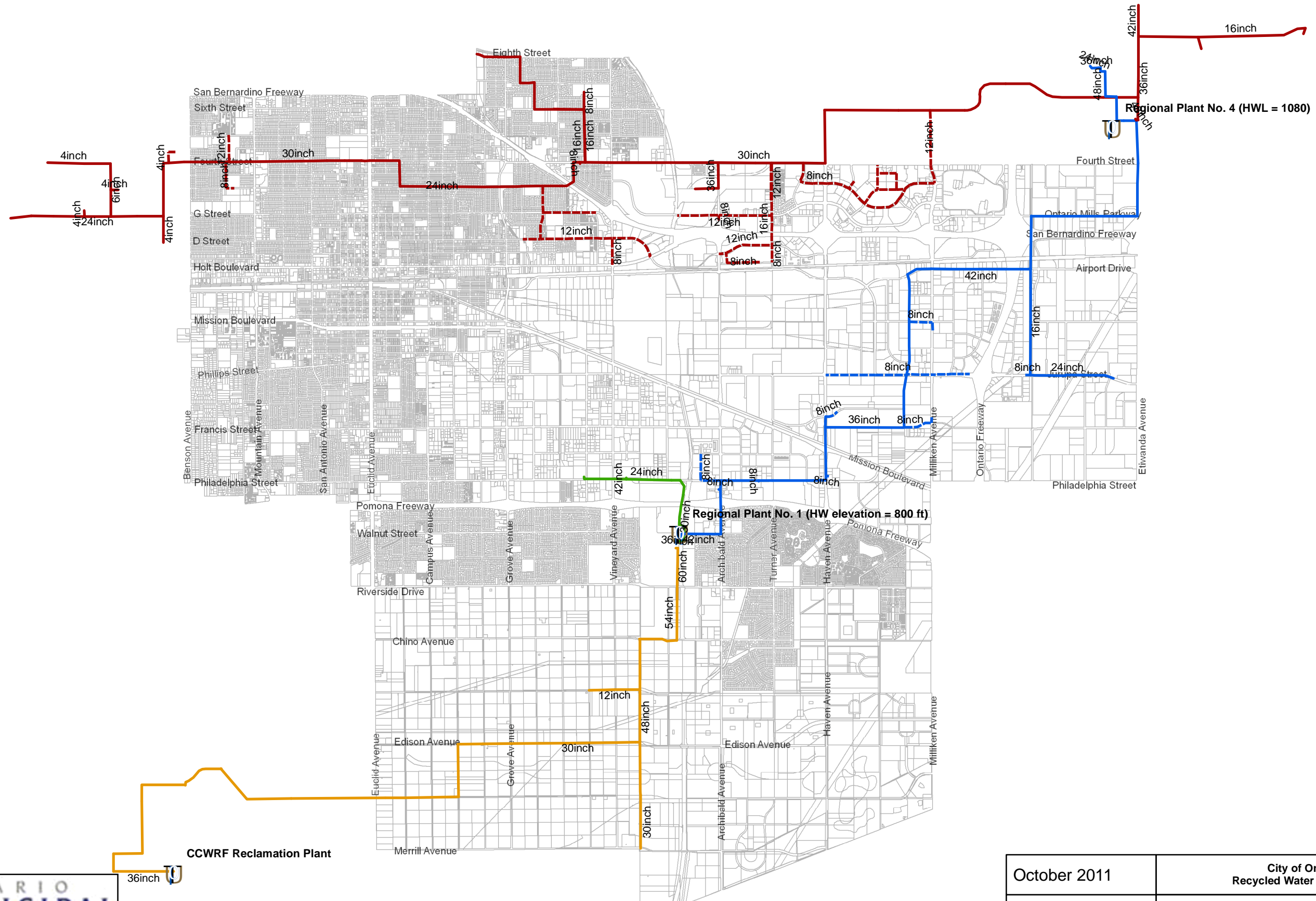



Table 4-1 - Recycled Water Consumption						
YEAR	Per Year			Cumulative		
	Non-AG	Ag	Total	Non-AG	Ag	Total
1976	622.00	0.00	622.00	622.00	0.00	622.00
2000	0.41	0.00	0.41	622.41	0.00	622.41
2001	209.78	0.00	209.78	832.19	0.00	832.19
2002	0.00	0.00	0.00	832.19	0.00	832.19
2003	0.00	0.00	0.00	832.19	0.00	832.19
2004	0.00	0.00	0.00	832.19	0.00	832.19
2005	0.00	460.00	460.00	832.19	460.00	1292.19
2006	46.01	1736.57	1782.58	878.20	2196.57	3074.77
2007	56.42	0.00	56.42	934.62	2196.57	3131.19
2008	156.50	577.00	733.50	1091.12	2773.57	3864.69
2009	1546.07	1350.00	2896.07	2637.19	4123.57	6760.76
2010	332.36	0.00	332.36	2969.55	4123.57	7093.12

4-3 Existing City System

At the time of the update of the hydraulic model (January 2010) the City’s Existing Recycled Water System served 2,637 AFY of Recycled Water for irrigation and process uses (not including agricultural users) and consisted of 69,821 LF of pipe and 62 major segments. Table 4-1 above includes some projected estimates for expected future connections in 2010. See Figure 4-3 for the Existing Recycled Water System.



-  Regional Plant
- 1299 IEUA
- - - 1299 ONTARIO
- 1158 IEUA
- - - 1158 ONTARIO
- 1050 IEUA
- 930 IEUA



4-4 Existing Users

Appendix A contains a complete list of all current Recycled Water Users.

4-5 Interim Agricultural Users

As shown Highlighted in green in Appendix A, there are sixteen (16) Agricultural Users consuming 4,124 AF/Y of Recycled Water. While this use seems to be significant, these Agricultural Users are considered temporary uses; as the NMC develops, the agricultural land will develop into residential, commercial, industrial, and other non-agricultural uses and these future users are included as part of the vacant land conversions. Also, the current temporary Agricultural users are primarily along IEUA Regional Pipelines and IEUA is working with the City and other local agencies to manage their diurnal uses. Therefore, no future projections for Agricultural uses were studied or modeled.

4-6 Recycled Water Demand Factors

In calculating overall total potential Recycled Water demand, existing meter data was used for the customers currently on recycled water and existing potable water meter data was used for those proposed to convert. For vacant land, averages of existing meter data was used to determine a Demand Factor for each land use type. Through the General Plan Update process, several existing land use designations were changed or combined into different land use designation in the new Ontario Plan. See Appendix C for a listing and description of previous Land Uses and Abbreviations. A Demand Factor was calculated for each new land use type to use for determining demand for vacant lands.

Residential Uses

Annual irrigation demands for low/medium and medium density future NMC residential land-uses were determined based upon actual meter readings for existing similar residential product types throughout the City, primarily in the OMC. The following nine existing developments were considered using meter readings acquired between 2008 and 2010:

- a. *101 N. Plum, adjacent to City Hall (2.26 AF/yr/acre);*
- b. *1110 E. Philadelphia Street, adjacent to the Lowe's Improvement Center (0.88 AF/yr/acre);*
- c. *950 N. Duesenberg (east-side), (1.25 AF/yr/acre);*
- d. *Existing Edenglen development (1.10 AF/yr/acre);*
- e. *1052 E 6th St, Units 1-28 (1.45 AF/yr/acre);*
- f. *926 W. Philadelphia St (1.22 AF/yr/acre);*
- g. *1005 N. Center Av (0.76 AF/yr/acre);*
- h. *511 N. Palmetto Av (2.47 AF/yr/acre); and*
- i. *2020 S. Euclid (1.41 AF/yr/acre)*

Based on the above nine developments, samples a., g., and h. (as indicated in italics) were not used as the annual irrigation demand were well outside the normal averages. In addition, future NMC landscaping would include more drought tolerant (California-friendly) plant species along with strict conservation measures. Therefore, 1 AF/yr/acre was determined to be sufficient measure for future low density residential products in the NMC.

Additionally, Potable and Recycled Water Irrigation uses were studied for The Edenglan Specific Plan and The Chino Preserve and demand factors for Low-medium, Medium, and High Density Residential were refined and developed.

Commercial Uses

Weighted averages were calculated for commercial land uses as a whole and as individual components, based upon annual irrigation meter readings from 2008:

- a. 1.90 AF/yr/acre (all commercial, not including NROS)
- b. 2.54 AF/yr/acre (GC)
- c. 4.62 AF/yr/acre (GR)
- d. 2.37 AF/yr/acre (NC)
- e. 2.20 AF/yr/acre (NROS)
- f. 1.70 AF/yr/acre (PC)
- g. 5.92 AF/yr/acre (TC)

Please note that the above commercial land-uses have been changed since the adoption of the new Ontario General Plan. Therefore, several previous land-use types do not directly correlate with the new land-use types; however, we were able to categorize those several new land-use types as “combinations” of the old land-use. The following lists the new categories and new demand factors that were used in calculating the ultimate recycled water demand:

New Classification	Old Classification	New Composite Demand Factor (AF/yr/acre)
GC	GR, GC	3.32
OC	GC, PC	1.75
NC	NC	2.37
HOS	All Commercial	1.90 (NROS not included)
MU	All Commercial	1.90 (NROS not included)

Industrial Uses

Weighted averages were calculated for industrial land-uses as a whole and as individual components, based upon annual irrigation meter readings from 2008:

- a. 3.13 AF/yr/acre (all industrial)
- b. 3.70 AF/yr/acre (GI)
- c. 2.29 AF/yr/acre (IP)
- d. 3.26 AF/yr/acre (PI)
- e. 3.55 AF/yr/acre (VI)

Please note that the above industrial land-uses have been changed since the adoption of the new Ontario General Plan. Therefore, several previous land use types do not directly correlate with the new land use types; however, we were able to categorize those several new land use types as “combinations” of the old land use. The following lists the new categories and new demand factors that were used in calculating the ultimate recycled water demand:

New Classification	Old Classification	New Composite Demand Factor (AF/yr/acre)
ARPT	All Industrial	3.13
BP	IP	2.29
IND	All Industrial	3.13

Open Space Uses

Non- Recreational Open Spaces (OS-NR) are mainly open spaces along Edison power line easements that maybe used for trials, but only will be landscaped with native vegetation and not irrigated; therefore, a demand factor of 0 is assumed.

For Recreational Open Spaces (OS-R), an average of Parks currently connected to Recycled Water was used and a demand factor of 1.5 AF/Y was determined. This number was used for landscape Right-Of-Way (ROW) as well.

Public School and Public Facilities Uses

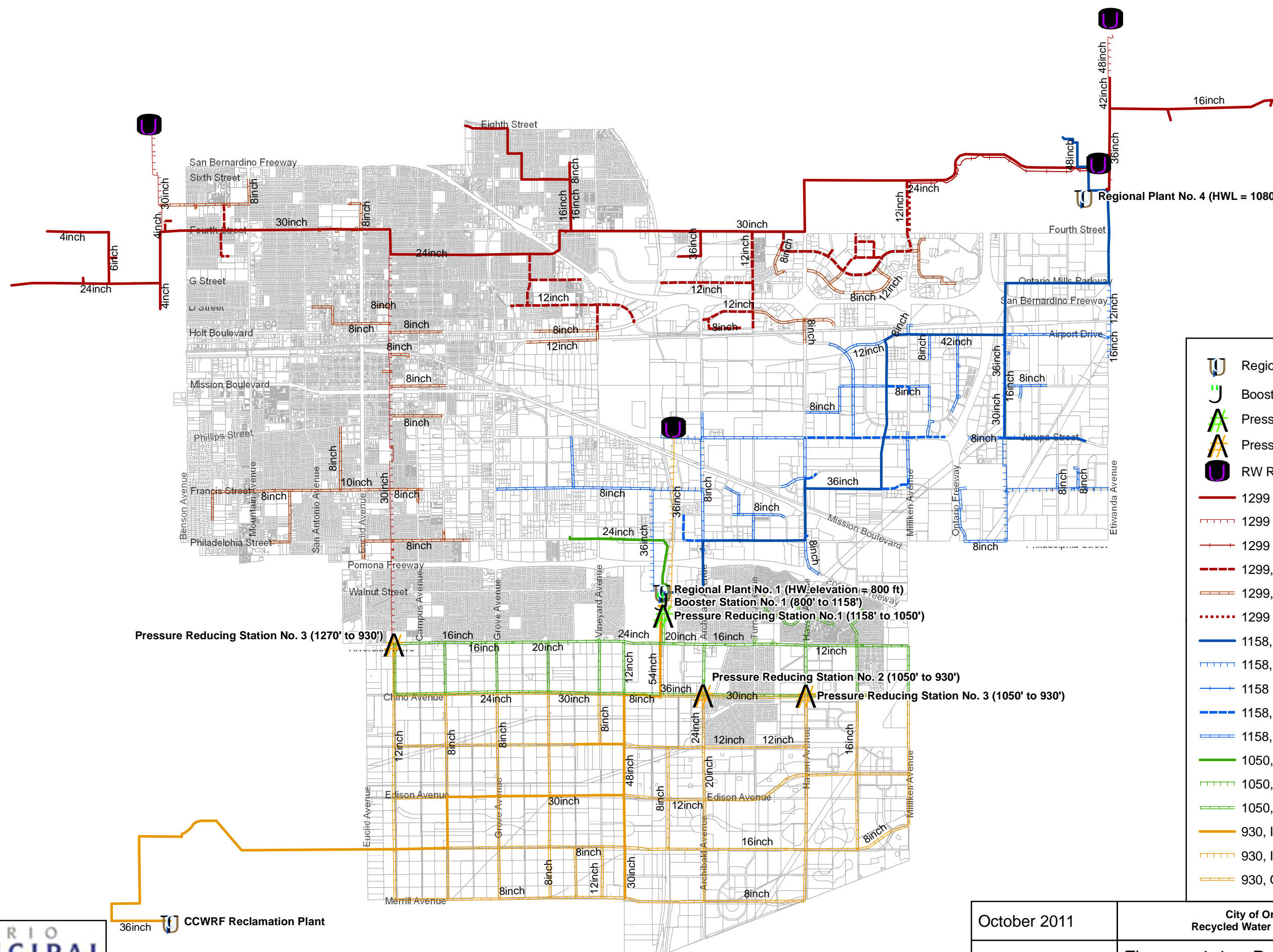
Public Schools and Public Facilities, such as Fire Stations, have a similar landscaping intensity and were determine to have the same demand factor.

To determine the Public School Demand factor, a weighted average of public schools currently connected to Recycled Water was calculated and a demand factor of 1.73 AF/Y found.

4-7 Future Recycled Water System

In the NMC, which is relatively undeveloped and does not have a lot of paved roads, it was determined that all new development would be required to connect to and use Recycled Water for all approved uses. Therefore, a grid backbone system of recycled water pipelines coincident with major arterial roadways was devised to serve the NMC.

For determining Recycled Water pipeline alignments in the OMC, original potential customers and alignments were preserved from Section 10 of the 2006 Water and Recycled Water Master Plan. In addition to the original 2006 customers and alignments, customers with irrigation meters were geographically located and alignments were created to serve clusters of those customers. Customers with separate irrigation meters are easier to connect to recycled water and require less time and money to retrofit for recycled water use. After the new alignments were created, additional potential customers were identified with combination meters along proposed alignments and are studied in Section 4-8. See Figure 4-4 for the Potential Future Recycled Water System.



- Regional Plant
- Booster Station
- Pressure Reducing Station
- Pressure Reducing Station
- RW Reservoirs
- 1299 IEUA Existing
- 1299 IEUA Planned
- 1299 IEUA Proposed
- 1299, ONTARIO Existing
- 1299, ONTARIO Planned
- 1299 ONTARIO Proposed
- 1158, IEUA Existing
- 1158, IEUA Planned
- 1158 IEUA Proposed
- 1158, ONTARIO Existing
- 1158, ONTARIO Planned
- 1050, IEUA Existing
- 1050, IEUA Planned
- 1050, ONTARIO Planned
- 930, IEUA Existing
- 930, IEUA Planned
- 930, ONTARIO Planned



4-8 Potential Recycled Water Users

Potential users were identified and separated into several categories depending on it's status of vacant land conversion or if it was previously studied or not.

Vacant Demand - The recycled water demand for all the land in the NMC and newly target land in the OMC.

All the land in the NMC was identified and summarized by land use and the new Recycled Water Demand Factors were applied. Vacant land along newly proposed laterals and regional lines was identified and the new Recycled Water Demand Factors were applied. This Demand excludes vacant land that was previously captured in the 2006 Master Plan. See Table 4-2 for a summary of vacant land.

Table 4-2 - Vacant Land Demand						
		OMC			NMC	
Use	Factor	Area	Demand	Area	Demand	
PROP_GP	[AF/AC]	[AC]	[AF]	[SF]	[AC]	[AF]
Residential						
RR	0.00		0.000	0.000	0.00	0.000
LDR	1.00		0.000	137563393	3,158.02	3,158.021
LMDR	1.12		0.000	22010261.9	505.29	563.765
MDR	1.68		0.000	46121288.9	1,058.80	1,781.701
HDR	1.68		0.000	0.000	0.00	0.000
Mixed Use						
MU	1.90	325.96	619.324	25239232.9	579.41	1,100.885
Commercial						
NC	2.37		0.000	4102621.93	94.18	223.214
GC	3.32		0.000	6375062.41	146.35	485.886
OC	1.75	10.83	18.954	5439713.13	124.88	218.538
HOS	1.90	3.73	7.078	0.000	0.00	0.000
Industrial						
BP	2.29	19.42	44.479	33425438.1	767.34	1,757.214
IND	3.13	257.38	805.593	11704475.2	268.70	841.024
Other						
OS-NR	0.00		0.000	19566725	449.19	0.000
OS-R	1.50		0.000	20100694.8	461.45	692.173
OS-W	1.50		0.000	2220432.76	50.97	76.461
PF	1.73		0.000	108166.476	2.48	4.296
PS	1.73		0.000	8616164.37	197.80	342.194
ARPT	2.29	195.68	448.113	0.000	0.00	0.000
Rail	0.00		0.000	0.000	0.00	0.000
ROW	1.50		0.000	0.000	161.00	241.500
Vacant Acres		813.00			8,025.87	
Total Vacant Demand			1,943.54			11,486.87

Existing Users – Current Recycled Water Demand from existing users excluding agricultural use.

The Recycled Water database was queried for total non-agricultural use as of December 30, 2009. Demand was derived from actual recycled water billing. For those users that did not have 12 months worth of recycled water use, use was taken from previous year's potable water billing data.

2006 Model Conversions – Potential Recycled Water conversions identified in the 2006 Water and Recycled Masterplan.

Demand was taken from the Table “Uses included in Feasibility Analysis” in Appendix H of 2006 Water and Recycled Masterplan. Users that were already converted to recycled water were excluded from this and included in the Existing Users Demand.

Regional Pipeline Conversions - Potential Recycled Water conversions along regional pipelines identified in the 2006 Water and Recycled Masterplan.

Demand was taken from the Table “Other Users (located along Regional Pipelines)” in Appendix H of 2006 Water and Recycled Masterplan. Users that were already converted to recycled water were excluded for this demand and included in the Existing Users Demand.

Proposed Update Conversions – New potential Recycled Water users not previously identified in the 2006 Water and Recycled Masterplan.

New potential areas of Industrial, Commercial, and Multi-Family for recycled water use were identified in the OMC and new proposed Recycled Water laterals were added to the 2006 Water and Recycled Masterplan during the Development Impact Fee (DIF) update process. Using GIS, the new laterals that were identified were buffered and overlaid with the existing meter data that was geocoded; the resulting layer was all meters that were serviceable from the new laterals. Of the meters that were within the service distance of the new laterals, only dedicated irrigation meters and combo meters for sites without irrigation meters were used. 100% of irrigation meter use and 10% of combo meter use was used to calculate the potential demand for this category.

4-9 Potential Future Recycled Water Demand

This Master Plan has been prepared to study all potential uses of Recycled Water in the City and present a potential overall demand. Actual construction of new Recycled Water pipelines and connection to customers will be based upon Recycle Water allocations from IEUA.

Table 4-3 shows the total potential Recycled Water Demand through out the City’s Service Area.

Table 4-3 - Total Potential Recycled Water Demand			
	OMC	NMC	Total
Total Vacant Demand	1,943.54	11,486.87	13,430.41
Existing Users	2,637.19		2,637.19
2006 Model Conversions	2,831.38		2,831.38
Region Pipeline Conversions	1,168.60		1,168.60
Proposed Update Conversions	6,577.89		6,577.89
Total AF	15,158.602	11,486.872	26,645.47