Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

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March 1, 2011

Regional Water Quality Control Board, Santa Ana Region
Attention: Mr. Gary Stewart
3737 Main Street, Suite 500
Riverside, California 92501-3348

Subject: Submittal of the Title 22 Engineering Report Update for the Chino Basin Recycled Water Groundwater Recharge Program

Dear Mr. Stewart,

The Regional Board's Water Recycling Requirements, Order No. 2007-0039 (Order) for the Chino Basin Recycled Water Groundwater Recharge Program – Phase I and Phase II Projects, requires that Inland Empire Utilities Agency (IEUA) and Chino Basin Watermaster (CBWM) submit an updated Title 22 Engineering Report every five years to address any project changes. The attached Title 22 Engineering Report Update outlines any changes that have occurred during the last five years of groundwater recharge program.

If you should have any questions regarding this report update, please feel free to contact me at (909) 993-1762.

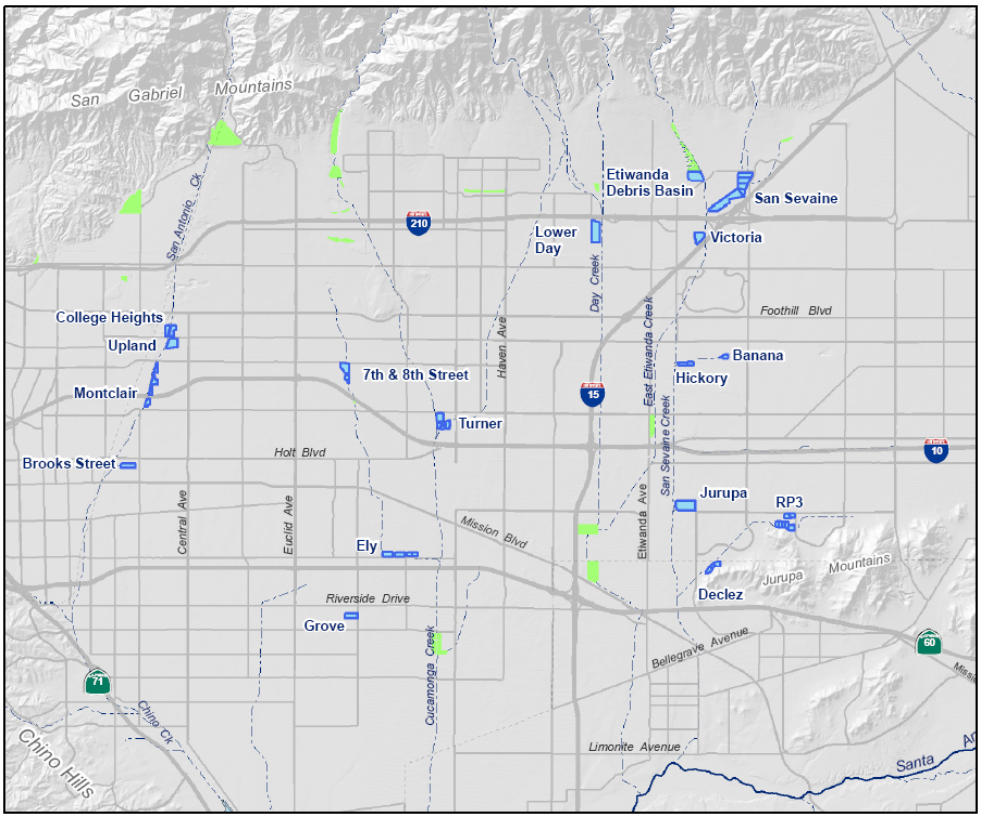
Respectfully submitted,

Chris Berch, P.E.
Manager of Planning & Environmental Compliance

cc: Heather Collins (CDPH), Ben Pak (CBWM), Patrick Sheilds, Randy Lee, Nel Groenveld, Andy Campbell, Bonita Fan

Chino Basin Recycled Water Groundwater Recharge Program

Title 22 Engineering Report Update



Prepared by:

Inland Empire Utilities Agency
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March 1, 2011

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Objective

The Regional Water Quality Control Board – Santa Ana Region (Regional Board) Water Recycling Requirements, Order No. 2007-0039 (Order) for the Chino Basin Recycled Water Groundwater Recharge Program – Phase I and Phase II Projects, requires that Inland Empire Utilities Agency (IEUA) and Chino Basin Watermaster (CBWM) submit an updated Title 22 Engineering Report every five years to address any project changes. The Monitoring and Reporting Program No. R8-2007-0039 (MRP), Section VI.C.1 describes the minimum requirements for the five year engineering report update.

"The update shall include, but not be limited to, a demonstration that:

a) The maximum RWC, as authorized pursuant to the terms of Order No. R8-2007-0039 (Recycled Water Quality Specification A.10), or amendment thereto will not be exceeded.

b) The minimum underground retention time required pursuant to Order No. R8-2007-0039 (Buffer Zone Specifications in Recharged Groundwater Basins, E.1), or amendment thereto will be met. The update shall also identify any changes in CDPH regulations pertaining to underground retention time and evaluate compliance with any such changes.

c) Any inconsistencies between groundwater model prediction and observation and/or measurement and how they are being addressed."

As agreed upon with the California Department of Public Health (CDPH) staff, the engineering report update is not meant to reiterate what was already presented in the prior engineering reports, but should focus on changes in the program over the last five years and projected changes in the next five years. The following is a summary of the changes that have occurred since the last Title 22 Engineering Report was certified and submitted in March 2006.

The organization of this engineering report update is to introduce each section of the Phase II Recycled Water Groundwater Recharge Project Title 22 Engineering Report and provide a brief discussion of notable changes in these sections. The changes will only be discussed once even though they may apply to several different sections within the engineering report. Additionally, documents relevant to the groundwater recharge program will be referenced in these sections and attached as electronic data files.

Section 1: Introduction

A. Section 1.4: Chino Basin Recharge Master Plan

- The 2010 Recharge Master Plan Update (RMPU) (WEI et al.) was completed in June 2010 as required by the Peace II Agreement. The court order approving the Peace II Agreement stipulated that the "RMPU contain recharge estimations and summaries of projected water supply availability as well as the physical means to accomplish those recharge projections. The RMPU reflects an appropriate schedule for planning, design and physical improvements – as required – to provide the replenishment capability sufficient to meet the reasonable projected replenishment obligations."
- Table 1-1: Potential Source Water Recharge Capacities for the Chino Basin Recycled Water Groundwater Recharge Program table has been updated to reflect current recharge capacities based on operational experience and available recharge water sources. As shown in Table 1-1, the average annual stormwater recharge at build out will be approximately 16,500 acre-feet per year (AFY) (excluding smaller recharge projects potentially developed as part of MS4 permitting) and

approximately 101,000 AFY of supplemental water recharge (imported and recycled water) for a total of approximately 117,000 AFY of recharge capacity.

B. Section 1.5: Phase I Recharge Project & 1.6: Phase II Recharge Project

- On October 23, 2009, the Regional Board adopted Order No. R8-2009-0057, amending Order No. R8-2007-0039, Water Recycling Requirements for the Chino Basin Recycled Water Groundwater Recharge Program Phase I and Phase II Projects (RWQCB, 2009b). The permit amendment extends the previous 60-month averaging period to 120 months for determining a recharge site's recycled water contribution (RWC). The amendment also allows a fraction of the groundwater underflow of the Chino Basin aquifers to be used as a source of diluent water when calculating the RWC. The provisions of the permit amendment were evaluated and supported by an expert panel assembled by the National Water Research Institute (NWRI). The report of the expert panel is included in the electronic attachments to this update, as it outlines the approved method of estimating groundwater underflow to each basin (NWRI, 2010).
- The distinction between Phase I and Phase II recharge basins will be eliminated and the basins are identified as "program basins." Phases I and II designations originally used in the recharge permit pertained to the phasing of the Chino Basin Facilities Improvement Project and are no longer relevant.

Section 2: Project Participants and Regulations

A. Section 2.2: Rules and Regulations

- The Draft Groundwater Recharge Reuse Regulations were most recently updated by the CDPH on August 5, 2008. (CDPH, 2008)

B. Section 2.2.3: Buffer Zones and Alternative Water Supply Requirements

- IEUA adopted Resolution No. 2007-6-17 prohibiting well drilling within 500 feet of a groundwater recharge basin that will be used for recharging recycled water (IEUA, 2007). With the adoption of the resolution, both IEUA and CBWM work together to restrict the drilling of wells within 500 feet of the recharge basins and where extracted water would not have at least 6 months underground retention time. IEUA closely monitors the well permitting activities of the County of San Bernardino Department of Environmental Health Services (DEHS) to make sure domestic supply wells are located outside the soil aquifer treatment zone near the recharge basin.

Section 3: Project Facilities

A. Section 3.1: Water Recycling Plants

- The Regional Water Recycling Plant No. 1 (RP-1) Title 22 Engineering Report update was completed in January 2010. The document was submitted to the Regional Board and the CDPH. The engineering report included changes to the process flow schematics and the recycled water distribution system within the facility (IEUA, 2010).
- The Regional Water Recycling Plant No. 4 (RP-4) Title 22 Engineering Report update was completed in September 2009. The document was submitted to the Regional Board and the CDPH. The engineering report included changes to the process during the plant expansion from 7 million gallons per day (MGD) to 14 MGD design capacity and the recycled water distribution system within the facility (IEUA, 2009).

- On July 20, 2009, the Regional Board adopted Order No. R8-2009-0021, NPDES No. CA8000409. This is an individual NPDES permit which consolidated the three existing NPDES permits and regulates the four Regional Water Recycling Facilities operated by IEUA (RWQCB, 2009a).

B. Section 3.3: Recycled Water Distribution Facilities

- Figure No. 1 portrays the current status of the recycled water distribution system map.

C. Section 3.4: Recharge Basins

- Figure No. 2 portrays the current recharge basin locations map. The map specifies which program basins receive recycled water.

Section 4: Recycled Water Distribution and Management

A. Section 4.1: Industrial Pretreatment and Source Control Programs

- In June 2007, the RWQCB adopted Order No. R8-2007-0045 amending Order No. R8-2006-0010 (RWQCB, 2007). The amendment incorporated source control requirements that the CDPH recommended, thereby consolidating all pretreatment related requirements for the existing NPDES permit for RP-1 and RP-4. The source control program was subsequently updated to include:

  a. An assessment of the fate of the specified contaminant compounds through the wastewater and recycled water treatment systems.

  b. A source investigation and monitoring program focused on the specified contaminants.

  c. An outreach program to industrial, commercial and residential communities within the sewage collection agency's service area to manage and minimize the discharge of compounds of concern at the source.

  d. A proactive program for maintaining an inventory of compounds discharged into the wastewater collection system so that new compounds of concern can be evaluated rapidly.

  IEUA has since implemented a chemical database system, a “No Drugs Down the Drain” program, a Fats, Oil, and Grease (FOG) outreach program, and a water softener removal rebate program (IEUA, 2009).

B. Section 4.2: Wastewater Characteristics

- Table 4-1: RP-1 and RP-4 Raw Wastewater Characteristics has been updated with water quality data from the 2009 calendar year.

Section 5: Recycled Water Quality

A. Section 5.1: RP-1 and RP-4 Treated Effluent Quality

- Table 5-1: RP-1 and RP-4 Effluent - General Monitoring data for 002 Effluent has been updated with water quality data from the 2009 calendar year.
- Table 5-2: RP-1 and RP-4 Effluent - Inorganic Compounds data for 002 Effluent has been updated with water quality data from the 2009 calendar year.

- Table 5-3: RP-1 and RP-4 Effluent – Volatile Organic Compounds data for 002 Effluent has been updated with water quality data from the 2009 calendar year.

Section 6: Supplemental Water Sources

A. Section 6.1: Imported Water Quality

- Assumptions about the availability of imported water have changed since the development of the recharge program. Due to drought and reduction in State Water Project supplies, replenishment water from Metropolitan Water District has not been available since mid-2007 and Metropolitan Water District has indicated that replenishment water would only be available on average 3 out of every 10 years. The prior assumption had been that replenishment water would be available in 7 of 10 years. The change in availability was a key reason the recharge permit was amended in 2009. Imported water quality monitoring consists of the monitoring conducted by Metropolitan Water District and reported in the recharge program's annual report when imported water is recharged.

B. Section 6.2: Storm Water Quality

- The water quality monitoring of diluent water sources used for recharge was presented in a Diluent Water Monitoring Plan (DDB, 2007) and subsequently approved by CDPH. The plan is included in the electronic attachments.
- The monitoring of the water quality of storm water and dry weather flows used for recharge was presented in a Diluent Water Monitoring Plan. The plan calls for twice-per-year monitoring of each creek that supplies recharge water, once each for dry weather flows and storm flows. Monitoring results are presented in the program's annual report (IEUA & CBWM, 2010).

Section 7: Recharge Basin Use Areas

A. Section 7.2: Domestic Well Locations

- Domestic monitoring wells are expected to be replaced throughout the life of the recharge program, as they are subject to failure or may be abandoned by their owners. Attachment C of the recharge permit lists the wells monitored for each recharge site. Table 7-2 is a Summary of Groundwater Monitoring Wells indicating the wells removed from and added to the monitoring program. The table specifies which wells are currently active and being monitored.

Section 8: Groundwater Recharge Impacts

A. Section 8.3: Recycled Water Underground Retention Time

- Recycled water recharge has been initiated at the following basins: Banana, Hickory, Ely, Turner, Brooks, 8th, RP3, San Sevaine 5, and Victoria Basins. The groundwater flow directions predicted in 2003 and 2006 using the Chino Basin groundwater flow model are generally consistent with observed conditions. Modeled and observed groundwater contour maps are included in the program's annual reports (IEUA & CBWM, 2010). Travel time to certain monitoring wells from the active basins were estimated using modeling assumptions based on aggressive groundwater production at build out and recharge at rates greater than current conditions to compensate for the greater production. These model assumptions yield underground residence times that are conservatively shorter than if modeled with lower production and recharge rates. Observed underground retention times are summarized in the programs annual report based on intrinsic tracers such as electrical conductivity. Table 8-1 lists the modeled and observed travel times.

None of the observed travel times are shorter than the minimum required 180 days for potable wells.

- A tracer study took place at Turner Basin in late 2004. Based on the data collected, the results of the study were inconclusive and travel time cannot be accurately estimated (IEUA & WEI, 2006).
- A tracer test took place at Brooks Basin from October 2008 through May 2009 to evaluate whether the travel time of groundwater recharge from the basin to the nearest potable use production well is greater or less than the 6-month minimum travel time required. The results from this test indicated that the travel time to the production wells is greater than 6 months (Clark, 2009).

Section 9: Monitoring and Reporting

A. Section 9.4: Groundwater Monitoring

- As identified in Section 7, wells that are currently part of the monitoring program are depicted on Figure Nos. 3-1 through 3-7.

- A revision of the Monitoring and Reporting Program No. R8-2007-0039 (RWQCB, 2010) allows IEUA to analyze dissolved metals instead of total recoverable metals for "monitoring well" samples susceptible to high turbidity originating from locations that are not potable use wells. Monitoring wells, in this case, include only wells that are not active municipal drinking water wells and are only sampled once a quarter by IEUA. Drinking water wells will continue to be analyzed for total recoverable metals per CDPH requirements.

Section 10: Operating and Contingency Plan

No notable changes to Section 10: Operating and Contingency Plan

Section 11: Training and Operational Monitoring

No notable changes to Section 11: Training and Operational Monitoring

Section 12: References

All documents referenced are attached electronically.

California Regional Water Quality Control Board, Santa Ana Region (RWQCB). 2007. *Order No. R8-2007-0045 Amending Order No. R8-2006-0010, NPDES No. CA0105279, Waste Discharge and Producer/User Reclamation Requirements for Inland Empire Utilities Agency Regional Water Recycling Plants No. 1 & 4.* June 2007.

California Regional Water Quality Control Board, Santa Ana Region (RWQCB). 2009a. *Order No. R8-2009-0021, NPDES No. CA8000409, Waste Discharge and Producer/User Reclamation Requirements for Inland Empire Utilities Agency Regional Water Recycling Facilities Surface Water Discharges and Recycled Water Use.* July 2009.

California Regional Water Quality Control Board, Santa Ana Region (RWQCB). 2009b. *Order No. R8-2009-0057 Amending Order No. R8-2007-0039, Water Recycling Requirements for Inland Empire Utilities Agency and Chino Basin Watermaster, Chino Basin Recycled Water Groundwater Recharge Program, Phase I and Phase II Projects.* October 2009.

California Regional Water Quality Control Board, Santa Ana Region (RWQCB). 2010. *Revised Monitoring and Reporting Program No. R8-2007-0039 for the Inland Empire Utilities Agency and Chino Basin Watermaster, Chino Basin Recycled Water Groundwater Recharge Program, Phase I and Phase II Projects.* October 2010.

California Department of Public Health (CDPH). August 2008. *Draft Groundwater Recharge Reuse Regulation.*

Clark, Jordan F. 2009. *Brooks Street Basin Tracer Experiment, Chino Groundwater Basin, CA, Final Report.* Department of Earth Science, University of California, Santa Barbara. December 2009.

DDB Engineering, Inc. 2007. *Diluent Water Monitoring Plan for the Chino Basin Recycled Water Groundwater Recharge Program Phase I and Phase II Recharge Projects*. October 2007.

DDB Engineering, Inc. 2009. *IEUA Regional Plant No. 4 Title 22 Engineering Report.* September 2009.

DDB Engineering, Inc. 2010. *IEUA Regional Plant No. 1 Title 22 Engineering Report.* January 2010.

Inland Empire Utilities Agency (IEUA). 2007. *Resolution No. 2007-6-17.* June 2007.

Inland Empire Utilities Agency (IEUA). 2009. *IEUA Response Letter Chino Basin 120-Month RWC Compliance Period, Attachment A: IEUA Pretreatment Program.* June 2009.

Inland Empire Utilities Agency & Chino Basin Watermaster. (IEUA & CBWM). 2010. *Chino Basin Recycled Water Groundwater Recharge Program 2009 Annual Report.* May 2010.

Inland Empire Utilities Agency & Wildermuth Environmental, Inc. (IEUA & WEI). 2006. *Tracer Study at Turner Basin.* Text extracted from Chino Basin Recycled Water Groundwater Recharge Program 2005 Annual Report submitted May 2006.

National Water Research Institute (NWRI). 2010. *Final Report of the February 8-9, 2010, Meeting of the Independent Advisory Panel for the Inland Empire Utilities Agency's Groundwater Recharge Permit Amendment.* April 2010.

Wildermuth Environmental Inc., Black & Veatch Corporation, Wagner & Bonsignore, and Sierra Water Group (WEI et al.). 2010. *2010 Recharge Master Plan Update, Final Report.* June 2010.

Table 1-1: Estimated Recharge Capacity (AFY)

Recharge Site	Storm Water (1)	Supplemental Water Capacity (2)	Imported Water (3)	Recycled Water (4)
Ely Basins	1,411	2,474	2,474	594
Banana Basin	483	2,474	2,061	747
Declez Basin	995	2,968	2,474	900
Etiwanda Conservation Ponds(5)	0	0	0	0
Hickory Basin	231	2,474	2,061	818
Jurupa Basin	0	0	0	0
RP3 Basins	466	9,895	8,245	2,119
Turner Basin Nos. 1 & 2	814	1,484	742	398
Turner Basin Nos. 3 & 4	772	1,484	742	500
7th & 8th Street Basins	1,234	2,474	2,474	1,765
Etiwanda Spreading Basins	1,617	3,463	3,463	2,400 (6)
Lower Day Basin	637	4,453	4,453	4,453 (6)
Brooks Street Basin	713	2,474	2,474	2,033
College Heights Basins	0	7,421	7,421	0
Montclair Basin Nos. 1-4	1,076	19,789	19,789	0
Upland Basin	637	9,895	9,895	0
San Sevaine Nos. 1-5	3,975	24,736	11,379	1,100
Victoria Basin	937	2,968	2,968	950
Wineville	296	0	0	0
Grove	268	0	0	0
Subtotals	16,562	100,926	83,115	18,777

Notes

(1) Average Annual Future Stormwater Recharge at Build Out (includes no new recharge from MS4 Permits, management of runoff): CBWM, IEUA and CBWCD, 2010 Recharge Master Plan Update, Table 3-8.

(2) Supplemental Water is non-stormwater recharge such as imported and or recycled water. Source: CBWM, IEUA and CBWCD, 2010 Recharge Master Plan Update, Table 6-3 - Table 6-3 - Supplemental Water Recharge Capacity Estimates. Imported water and recycled water volumes together would not in theory exceed this value.

(3) Theoretical Maximum Imported Water Recharge Capacity. Source: CBWM, IEUA and CBWCD, 2010 Recharge Master Plan Update, Table 6-3 - Supplemental Water Recharge Capacity Estimates.

(4) RWC Management Plans: IEUA and CBWM, 2009, Recycled Water Groundwater Recharge Annual Report, Appendix C. and approximates the low to midrange of recycled water recharge projected in Section 6.4.2 of the 2010 Recharge Master Plan Update.

(5) Etiwanda Conservation Ponds site has not yet been developed.

(6) Etiwanda Debris Basin and Lower Day are permitted for recycled water recharge, but do not currently have infrastructure to deliver water to them. The projection of Etiwanda Spreading Basin is that from the Phase II Title 22 Engineering Report for the Recycled water Groundwater Recharge Project. The estimate for Lower Day equal to the Supplemental Water Recharge Capacity Estimate as that is lower than that estimated by the Phase II Title 22 Engineering Report, IEUA and CBWM, 2006.

Table 4-1: RP-1 & RP-4 Raw Wastewater Characteristics (2009)

Constituent	Units	RP-1			RP-4		
		Avg	Min	Max	Avg	Min	Max
Flow	mgd	30.9	26.0	40.4	8.8	5.6	13.4
Specific Conductance (EC)	µmhos/cm	976	770	1,299	965	680	1,440
pH	s.u.	7.2	6.4	7.7	7.4	6.7	7.7
Total Dissolved Solids (TDS)	mg/L	457	394	516	467	376	568
Total Organic Carbon (TOC)	mg/L	175	75	332	150	81	241
Biochemical Oxygen Demand (BOD)	mg/L	331	130	863	277	142	449
Total Suspended Solids (TSS)	mg/L	468	90	1,350	281	54	819
Total Inorganic Nitrogen (TIN)	mg/L	29.4	16.6	36.0	43.6	26.0	56.3
Total Kjeldahl Nitrogen (TKN)	mg/L	56.3	48.9	66.0	50.5	42.7	59.0
Ammonia as Nitrogen (NH_3-N) grab	mg/L	29.7	15.8	43.1	49.8	29.8	56.5
Free Cyanide	µg/L	<2	<2	<2	<2	<2	3
Total Hardness	mg/L as $CaCO_3$	177	149	222	156	144	167
Boron	mg/L	0.2	0.2	0.5	0.3	0.2	0.3
Chloride	mg/L	78	62	92	87	55	153
Fluoride	mg/L	0.3	0.3	0.4	0.3	0.2	0.4
Sodium	mg/L	79	67	90	86	71	113
Sulfate	mg/L	35	30	41	38	31	46
Arsenic, Total Recoverable	µg/L	<10	<10	<10	<10	<10	10
Cadmium, Total Recoverable	µg/L	<10	<10	<10	<10	<10	<10
Chromium, Total Recoverable	µg/L	<10	<10	10	<10	<10	<10
Copper, Total Recoverable	µg/L	103	50	150	76	70	90
Lead, Total Recoverable	µg/L	<20	<20	<20	<20	<20	<20
Mercury, Total Recoverable	µg/L	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Nickel, Total Recoverable	µg/L	<10	<10	<10	<10	<10	<10
Selenium, Total Recoverable	µg/L	<20	<20	<20	<20	<20	<20
Silver, Total Recoverable	µg/L	<10	<10	<10	<10	<10	<10
Zinc, Total Recoverable	µg/L	231	150	370	161	120	190

Table 5-1: RP-1 & RP-4 Effluent – General Monitoring (2009)

Constituent	Units	002 Effluent*		
		Avg	Min	Max
Flow	mgd	16.1	1.8	37.4
Specific Conductance (EC)	µmhos/cm	909	695	1,171
pH	s.u.	7.1	6.5	8.0
Total Dissolved Solids (TDS)	mg/L	504	428	554
Total Organic Carbon (TOC)	mg/L	5.3	4.0	7.2
Biochemical Oxygen Demand (BOD)	mg/L	<2	<2	3
Total Suspended Solids (TSS)	mg/L	<1	<1	2
Total Inorganic Nitrogen (TIN)	mg/L	5.7	2.0	8.5
Total Kjeldahl Nitrogen (TKN)	mg/L	5.4	2.0	8.0
Ammonia as Nitrogen (NH_3-N) grab	mg/L	<0.1	<0.1	0.2
Turbidity	NTU	0.6	0.4	0.8
Temperature	°C	25.2	21.5	29.1
Coliform (7-day median)	MPN/100mL	<2	<2	<2
Cl_2 Residual	mg/L	0.0	0.0	0.0

*002 Effluent is a blend of RP-1 & RP-4 water, which is not beneficially reused and is discharged into the Cucamonga Creek Flood Control Channel. 002 Effluent is used to represent the recycled water used for recharge due to its similar composition to the RP-1/RP-4 blend collected for quarterly monitoring at the GenOn turnout (formerly Reliant Energy).

Table 5-2: RP-1 & RP-4 Effluent - Inorganic Compounds (2009)

Constituent	Units	002 Effluent*		
		Avg	Min	Max
Free Cyanide	µg/L	<2	<2	3
Total Hardness	mg/L as $CaCO_3$	153	145	162
Bicarbonate Alkalinity	mg/L as $CaCO_3$	140	125	148
Boron	mg/L	0.2	0.2	0.2
Carbonate Alkalinity	mg/L as $CaCO_3$	0	0	0
Chloride	mg/L	111	95	120
Fluoride	mg/L	0.3	0.2	0.3
Magnesium	mg/L	9	8	10
Sodium	mg/L	105	87	116
Sulfate	mg/L	71	58	85
Aluminum, Total Recoverable	µg/L	21	7	95
Antimony, Total Recoverable	µg/L	0.6	0.5	0.6
Arsenic, Total Recoverable	µg/L	<2	<2	<2
Barium, Total Recoverable	µg/L	13	11	17
Cadmium, Total Recoverable	µg/L	<0.25	<0.25	<0.25
Chromium, Total Recoverable	µg/L	1.8	0.7	3.8
Cobalt, Total Recoverable	µg/L	<1	<1	<1
Copper, Total Recoverable	µg/L	3	2	4
Lead, Total Recoverable	µg/L	<0.5	<0.5	<0.5
Mercury, Total Recoverable	µg/L	<0.05	<0.05	<0.05
Nickel, Total Recoverable	µg/L	3	2	4
Selenium, Total Recoverable	µg/L	<2	<2	<2
Silver, Total Recoverable	µg/L	<0.25	<0.25	0.26
Zinc, Total Recoverable	µg/L	27	15	38

*002 Effluent is a blend of RP-1 & RP-4 water, which is not beneficially reused and is discharged into the Cucamonga Creek Flood Control Channel. 002 Effluent is used to represent the recycled water used for recharge due to its similar composition to the RP-1/RP-4 blend collected for quarterly monitoring at the GenOn turnout (formerly Reliant Energy).

Table 5-3: RP-1 & RP-4 Effluent – Measurable Volatile Organic Compounds (2009)

Constituent	Units	002 Effluent*		
		Avg	Min	Max
Bromodichloromethane	µg/L	15	9	20
Chloroform	µg/L	56	44	72
Dibromochloromethane	µg/L	3	<1	5
Methylene Chloride	µg/L	<9	<1	61

*002 Effluent is a blend of RP-1 & RP-4 water, which is not beneficially reused and is discharged into the Cucamonga Creek Flood Control Channel. 002 Effluent is used to represent the recycled water used for recharge due to its similar composition to the RP-1/RP-4 blend collected for quarterly monitoring at the GenOn turnout (formerly Reliant Energy).

Table 7-2: **Summary of Wells in the Groundwater Monitoring Network**

BASIN	CBWM ID	OWNER/LOCAL NAME	SEPARATION DISTANCE (feet)	STATUS	TYPE
Banana & Hickory	3600573	Fontana Water Company - F37a	2240 upgradient	Active	Municipal
	600660	California Speedway - Infield Well	2070 downgradient	Active	Industrial
	3601365	California Speedway 2	2780 downgradient	Active	Industrial
	3600371	Reliant Energy - East Well	4070 downgradient	Active	Industrial
	3602267	City Of Ontario - 20	14500 downgradient	Active	Municipal
	601001	IEUA - BH-1/1	340 downgradient	Active	Monitoring
	601002	IEUA - BH-1/2	340 downgradient	Active	Monitoring
Turner	3601065	City of Ontario - 19*	2200 upgradient	Inactive	Municipal
	3600010	City of Ontario - 25	2530 crossgradient	Inactive	Municipal
	600453	City of Ontario - 29	2810 downgradient	Active	Municipal
	600585	City of Ontario - 38*	4600 crossgradient	Active	Municipal
	600997	IEUA - TRN-1/1	50 downgradient	Active	Monitoring
	600998	IEUA - TRN-1/2	50 downgradient	Active	Monitoring
	600999	IEUA - TRN-2/1	50 downgradient	Active	Monitoring
	601000	IEUA - TRN-2/2	50 downgradient	Active	Monitoring
Declez	300208	Jurupa Community Services District - 19	8900 downgradient	Active	Municipal
	300207	Jurupa Community Services District - 17	5240 downgradient	Active	Municipal
	300200	Jurupa Community Services District - 13	5730 downgradient	Active	Municipal
	--	IEUA - DCZ-1	50 downgradient	Active	Monitoring
RP3	600492	Fontana Water Company - F23a	7900 upgradient	Active	Municipal
	600477	Southridge JHS	5500 downgradient	Active	Municipal
	600848	Alcoa - Offsite MW1	9480 downgradient	Active	Monitoring
	600850	Alcoa - Offsite MW3	4725 downgradient	Active	Monitoring
	--	IEUA - RP3-1/1	100 downgradient	Active	Monitoring
	--	IEUA - RP3-1/2	100 downgradient	Active	Monitoring
Jurupa	Not currently planned for recharge				
7th & 8th Street	3601561	San Antonio Water Company No. 12	740 downgradient	Inactive	Municipal
	3601772	City of Ontario No. 4	3429 downgradient	Inactive	Municipal
	--	City of Ontario No. 51	3402 downgradient	NA	Municipal
	600493	City of Ontario No. 35	9695 downgradient	Active	Municipal
	--	IEUA - 8th-1/1	150 downgradient	Active	Monitoring
	--	IEUA - 8th-1/2	150 downgradient	Active	Monitoring
	--	IEUA - 8th-2/1	2460 downgradient	Active	Monitoring

BASIN	CBWM ID	OWNER/LOCAL NAME	SEPARATION DISTANCE (feet)	STATUS	TYPE
	--	IEUA - 8th-2/2	2460 downgradient	Active	Monitoring
Brooks	1901719	City of Pomona P-10	1983 downgradient	Active	Municipal
	1901713	City of Pomona P-04	2620 downgradient	Inactive	Municipal
	1903156	City of Pomona P-30	2160 crossgradient	Inactive	Municipal
	1903016	City of Pomona P-2	3455 downgradient	Active	Municipal
	1901725	City of Pomona P-17	4500 downgradient	Inactive	Municipal
	--	IEUA - BRK-1/1	144 downgradient	Active	Monitoring
	--	IEUA - BRK-1/2	144 downgradient	Active	Monitoring
	--	IEUA - BRK-2/1	1305 downgradient	Active	Monitoring
	--	IEUA - BRK-2/2	1305 downgradient	Active	Monitoring
San Sevaine	600905	Cucamonga Valley Water District No. 39	8300-13170 downgradient	Active	Municipal
	--	IEUA - SS-1/1 & 1/2	~39-116 downgradient	Active	Monitoring
	600462	Unitex 91090	~1601 downgradient	Active	Private Domestic
Victoria	600905	Cucamonga Valley Water District No. 39	4329 downgradient	Active	Municipal
	601033	Cucamonga Valley Water District No. 43**	8300 downgradient	Active	Municipal
	3600212	Cucamonga Valley Water District No. 35**	8000 downgradient	Inactive	Municipal
	--	IEUA - VCT-1/1 & 1/2	~39-116 downgradient	Active	Monitoring
	--	IEUA - VCT-1/1 & 1/2	~2000 downgradient	Active	Monitoring
Ely	601003	Ely Basin MW-1, Philadelphia Well	100 downgradient	Active	Monitoring
	601004	Ely Basin MW-2, Walnut Well	3050 downgradient	Active	Monitoring
	3600975	Riverside Drive Well (43840-CWW)	6046 downgradient	Active	Private Irrigation
	600134	Bishop Of San Bernardino Corp. - DOM	6500 downgradient	Active	Private Domestic

Notes:

NA = Data not available
CBWM ID = Chino Basin Water Master well identification number
* = Ontario Well No. 38 replaced Ontario Well No. 19, which is inactive
** = Cucamonga Valley Water District No. 43 replaced CVWD Well No. 35, which is inactive

Table 8-1: Summary of Recycled Water Travel Times to Monitoring Wells

BASIN	OWNER/LOCAL NAME (1)	SEPARATION DISTANCE (feet)	ESTIMATED TRAVEL TIME (days)	OBSERVED TRAVEL TIME (days)	ESTIMATE SOURCE
Banana & Hickory	California Speedway - Infield Well	2070 downgradient	682	848	2), 4)
	California Speedway 2	2780 downgradient	No Estimate	Not Yet Observed	
	Reliant Energy - East Well	4070 downgradient	954	Not Yet Observed	2)
	City Of Ontario - 20	14500 downgradient	3,570	Not Yet Observed	2)
	IEUA - BH-1/1	340 downgradient	No Estimate	59	4)
	IEUA - BH-1/2	340 downgradient	No Estimate	59	4)
Turner	City Of Ontario - 25	2530 crossgradient	1,543	Not Yet Observed	2)
	City Of Ontario - 29	2810 downgradient	2,010	Not Yet Observed	2)
	IEUA - TRN-1/1	50 downgradient	No Estimate	97	4)
	IEUA - TRN-1/2	50 downgradient	No Estimate	97	4)
	IEUA - TRN-2/1	50 downgradient	No Estimate	285	4)
	IEUA - TRN-2/2	50 downgradient	No Estimate	285	4)
Declez	IEUA - Southridge JHS	5500 downgradient	2,310	Not Yet Observed	
	Alcoa - Offsite MW1	9480 downgradient	No Estimate	Not Yet Observed	
	Alcoa - Offsite MW3	4725 downgradient	No Estimate	Not Yet Observed	
	IEUA - RP3-1/1	100 downgradient	No Estimate	99	6)
	IEUA - RP3-1/2	100 downgradient	No Estimate	99	6)
	JCSD - 19	16,279 downgradient	5,762	Not Yet Observed	2)
	JCSD - 17	15,062 downgradient	5,850	Not Yet Observed	2)
7th & 8th Street	SAWCO No. 12	740 downgradient	476	out of service	3)
	City of Ontario No. 4	3429 downgradient	No Estimate	Not Yet Observed	
	City of Ontario No. 51	3402 downgradient	No Estimate	Not Yet Observed	
	City of Ontario No. 35	9695 downgradient	No Estimate	Not Yet Observed	
	IEUA - 8th-1/1	150 downgradient	No Estimate	660	4)
	IEUA - 8th-1/2	150 downgradient	No Estimate	Not Yet Observed	
	IEUA - 8th-2/1	2460 downgradient	No Estimate	Not Yet Observed	
	IEUA - 8th-2/2	2460 downgradient	No Estimate	402	4)
Brooks	City of Pomona P-10	1983 downgradient	263	Not Yet Observed	3)
	City of Pomona P-04	2620 downgradient	371	Not Yet Observed	3)
	City of Pomona P-30	2160 crossgradient	648	Not Yet Observed	3)
	City of Pomona P-17	4500 downgradient	1,987	Not Yet Observed	3)
	IEUA - BRK-1/1	144 downgradient	No Estimate	150	5)
	IEUA - BRK-1/2	144 downgradient	No Estimate	Not Yet Observed	
	IEUA - BRK-2/1	1305 downgradient	No Estimate	Not Yet Observed	
	IEUA - BRK-2/2	1305 downgradient	No Estimate	Not Yet Observed	
San Sevaine	CVWD No. 39	8300-13170	1,813	Not Yet Observed	3)
	IEUA - SS-1/1 & 1/2	~39-116 downgradient	No Estimate	Not Yet Observed	
Victoria	CVWD No. 39	4329 downgradient	1,810	Not Yet Observed	3)
	CVWD No. 43	7680 feet downgradient	No Estimate	Not Yet Observed	
	IEUA - VCT-1/1 & 1/2	~39-116 downgradient	No Estimate	Not Yet Observed	
	IEUA - VCT-1/1 & 1/2	~ 2000 downgradient	No Estimate	Not Yet Observed	

BASIN	OWNER/LOCAL NAME (1)	SEPARATION DISTANCE (feet)	ESTIMATED TRAVEL TIME (days)	OBSERVED TRAVEL TIME (days)	ESTIMATE SOURCE
Ely	Ely Basin MW-1_Philadelphia St.	100 downgradient	No Estimate	No Estimate	
	Ely Basin MW-2_Walnut St.	3050 downgradient	No Estimate	No Estimate	
	43840-CWW	6046 downgradient	No Estimate	No Estimate	
	Bishop Of San Bernardino Corp. - DOM	6500 downgradient	No Estimate	No Estimate	

Notes:

1) Wells in this list are downgradient wells listed in the RW GWR Permit. Cross gradient wells are listed if a travel time estimated was made for a Title 22 report.

2) Phase I Title 22 Engineering Report Chino Basin Recycled Water Groundwater Recharge Project, 2003 CH2MHill

3) Phase II Title 22 Engineering Report Chino Basin Recycled Water Groundwater Recharge Project, 2006, DDB Engineering, IEUA, Wildermuth Environmental

4) Chino Basin Recycled Water Groundwater Recharge Program 2009 Annual Report, May 2010

5) Start-Up Period Report for Brooks Street Basin, IEUA, 2010

6) Start-Up Period Report for RP3 Basin, IEUA, 2010

Figure No. 1: Current RW Distribution System Map

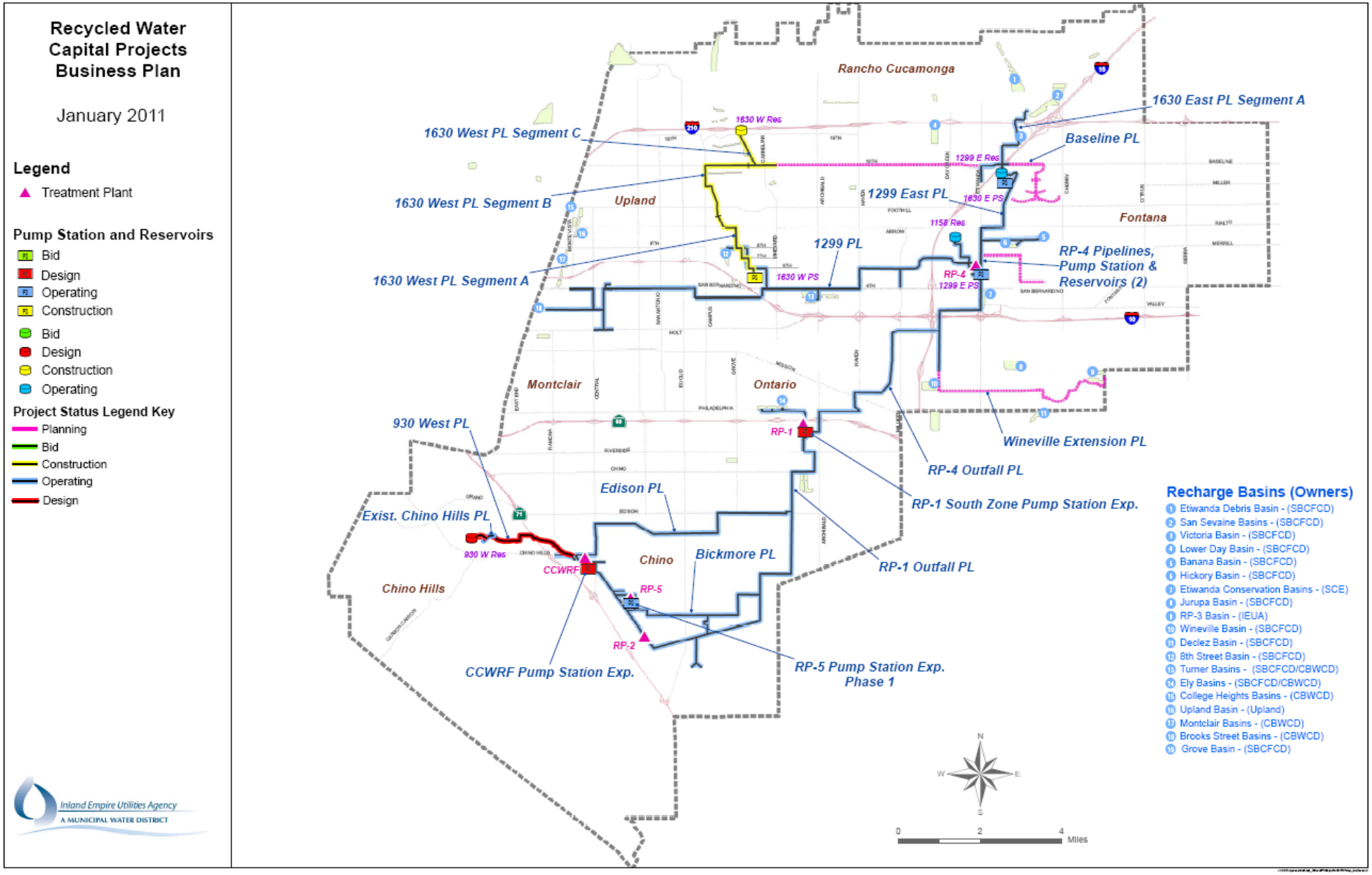

Figure No. 2: Current Basin Locations Map

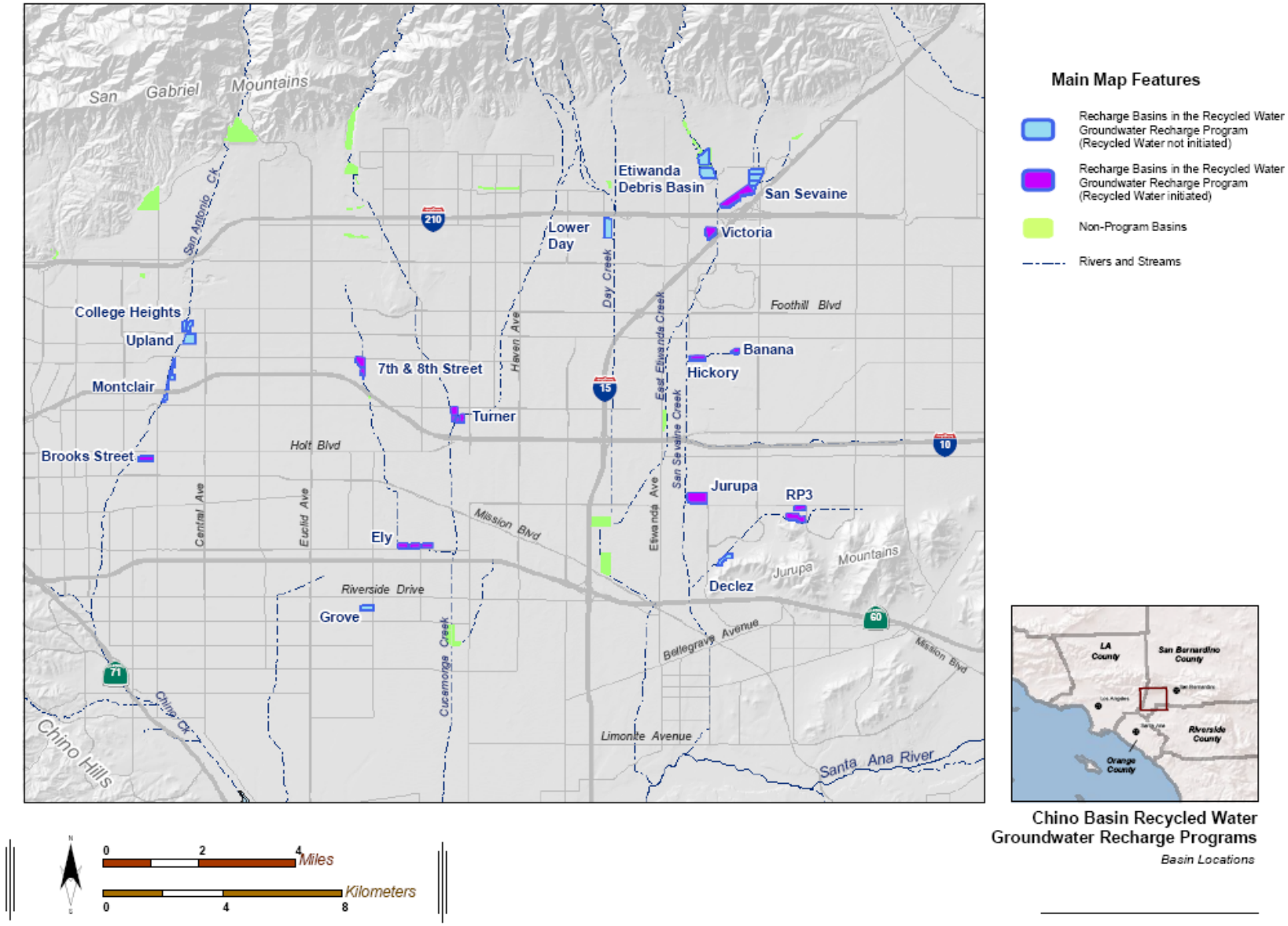

Figure No. 3-1: Hickory & Banana Basins Monitoring Well Network

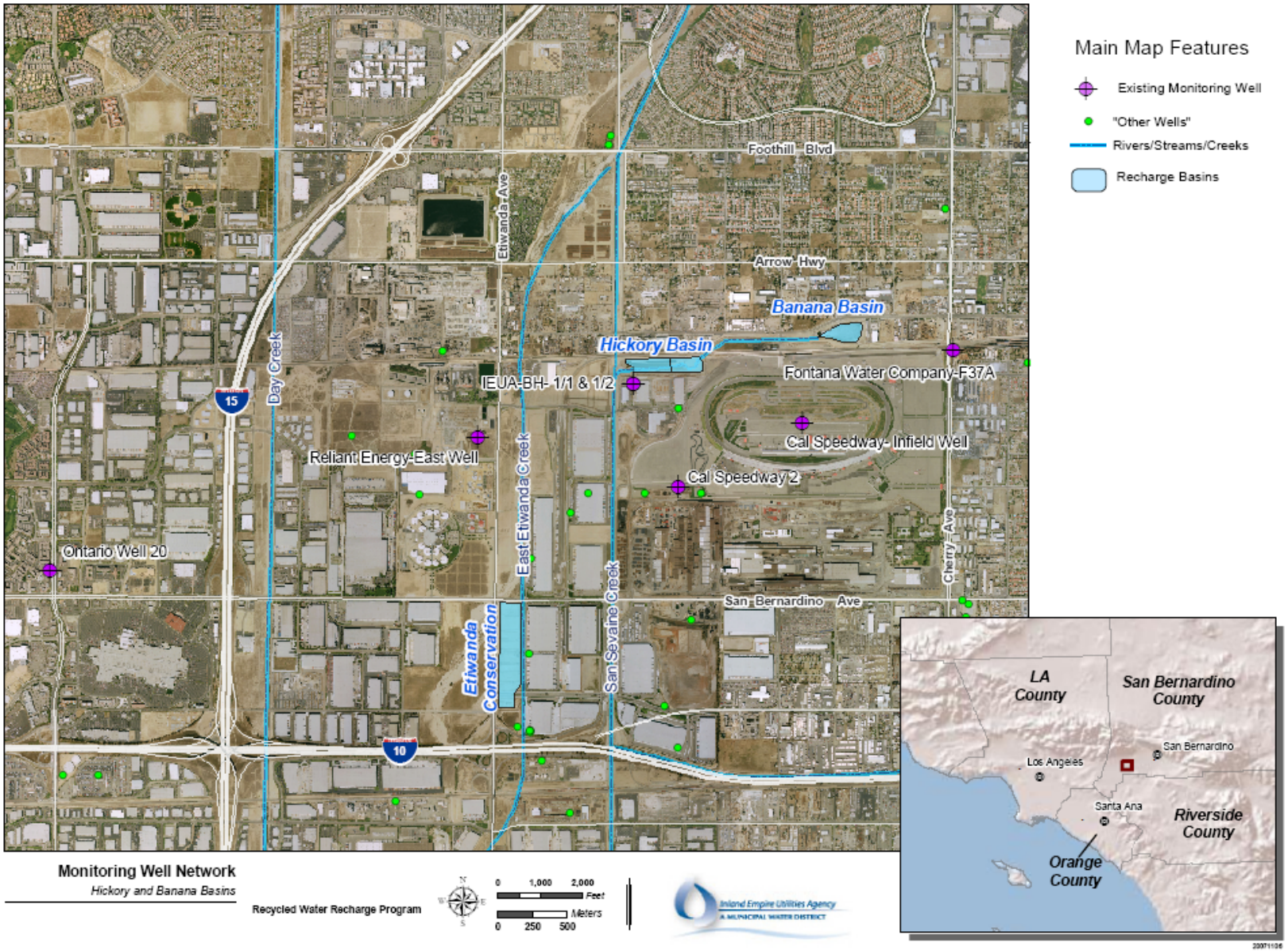

Figure No. 3-2: Turner Basins Monitoring Well Network

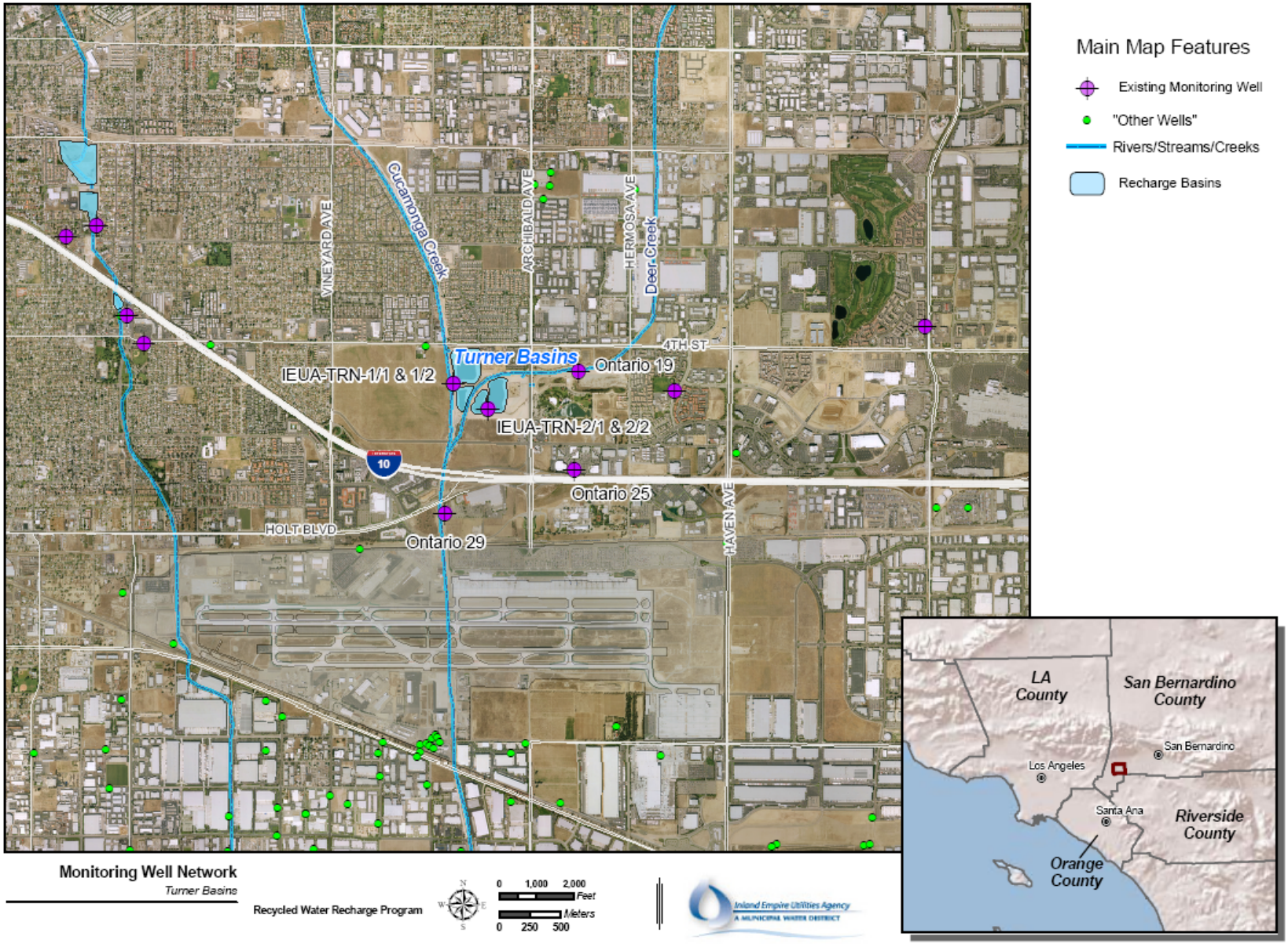

Figure No. 3-3: 7th & 8th Street Basins Monitoring Well Network

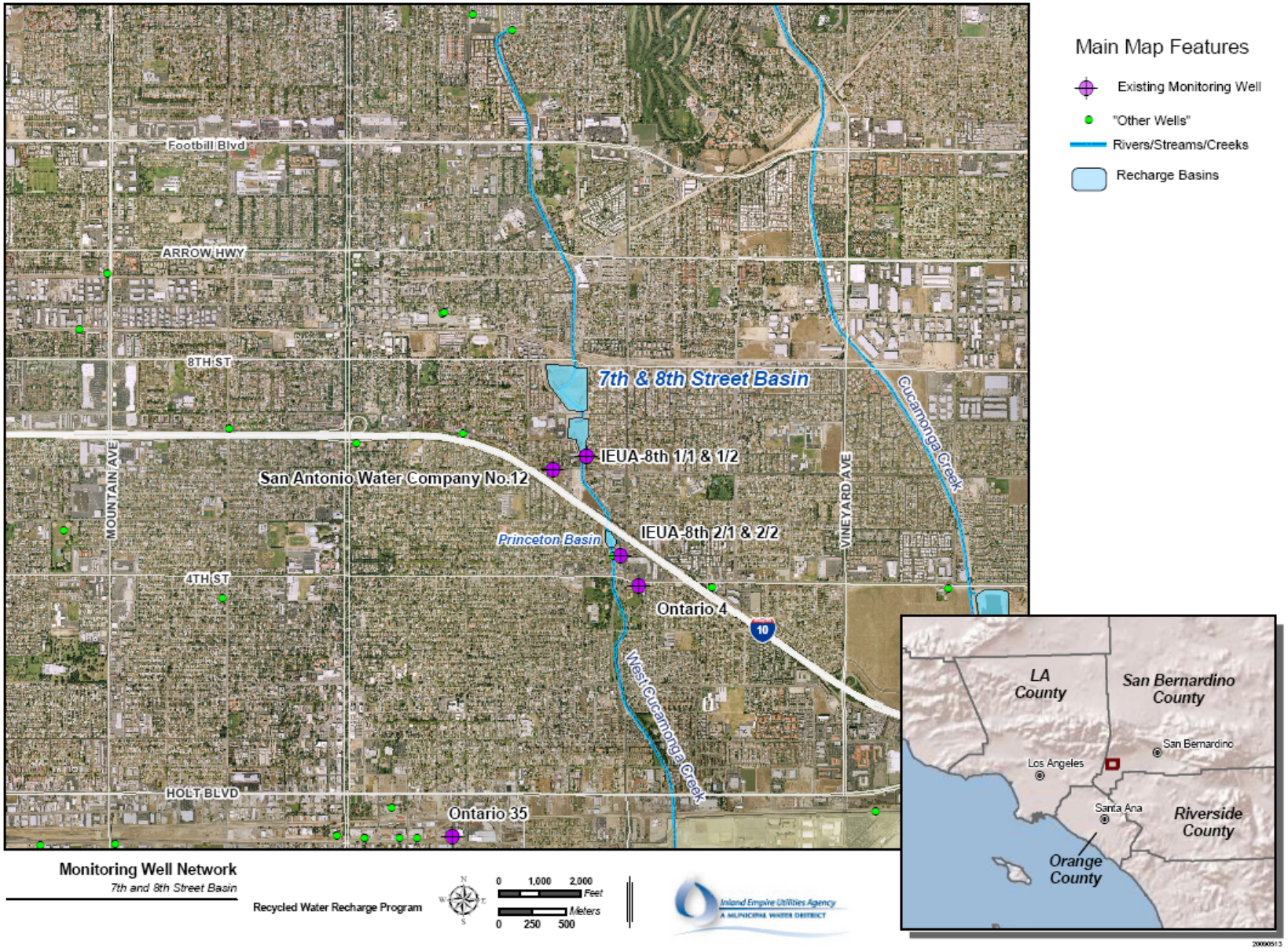

Figure No. 3-4: Ely Basins Monitoring Well Network

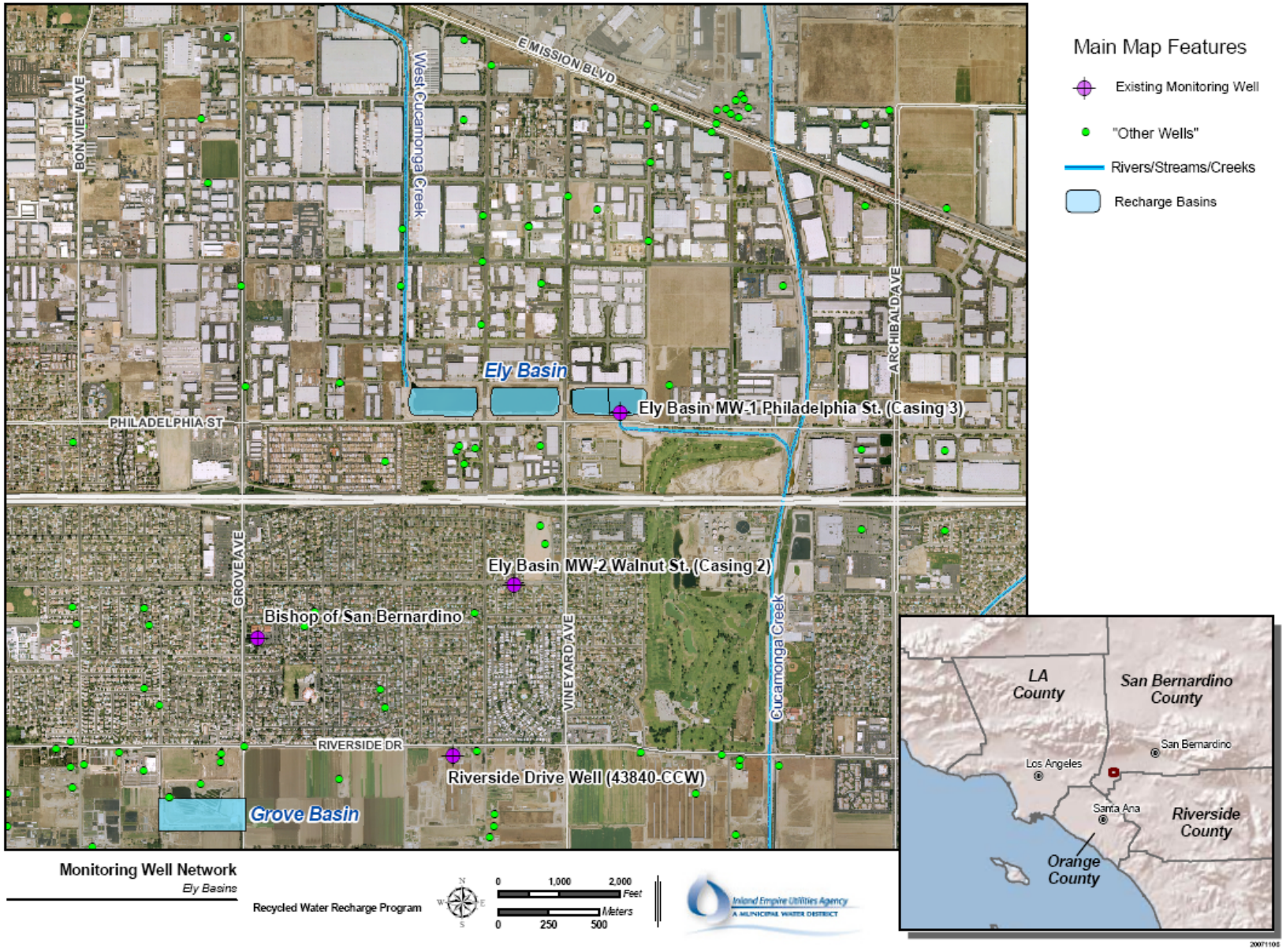

Figure No. 3-5: Brooks Street Basin Monitoring Well Network

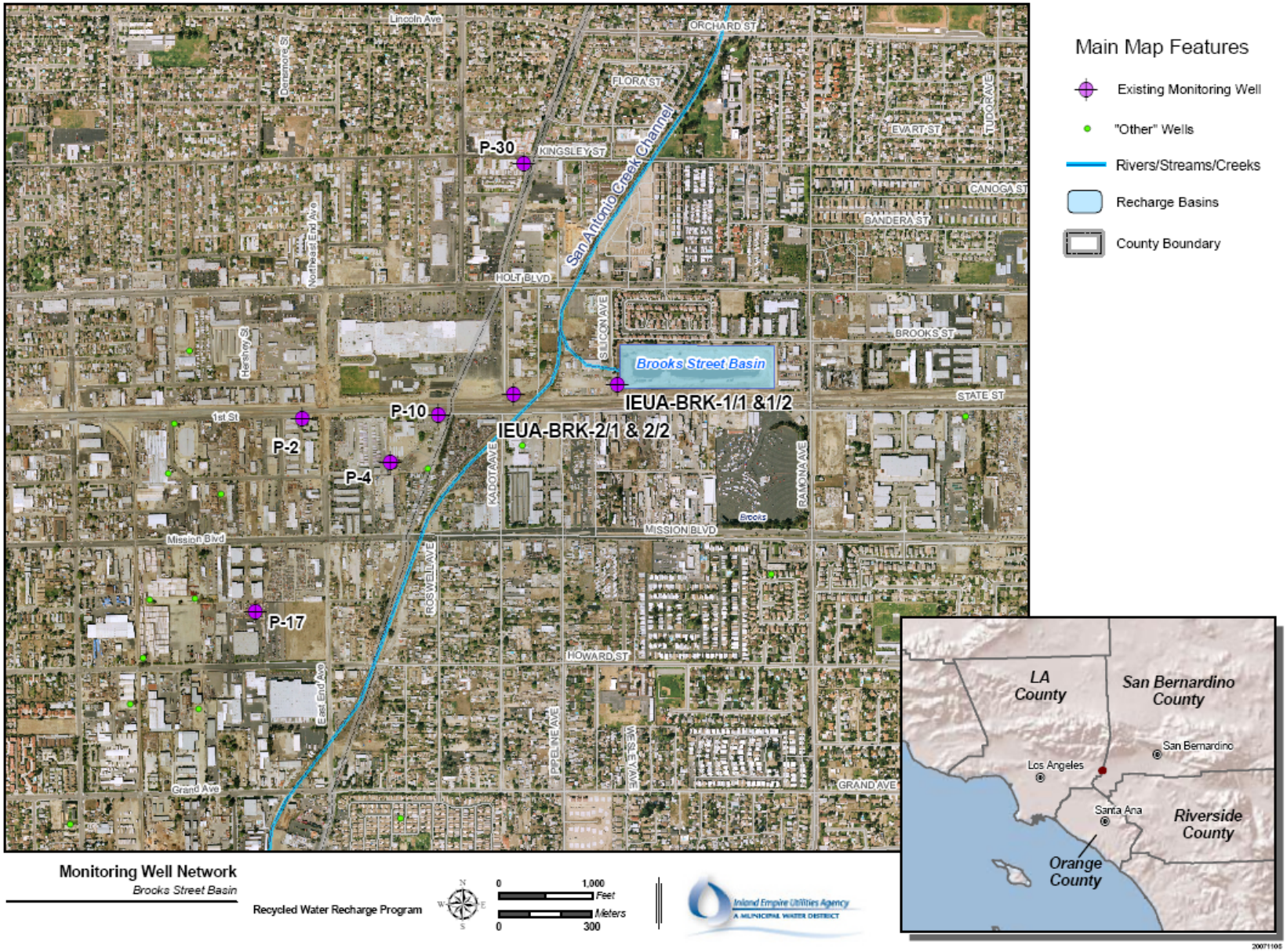

Figure No. 3-6: RP3 Basin Monitoring Well Network

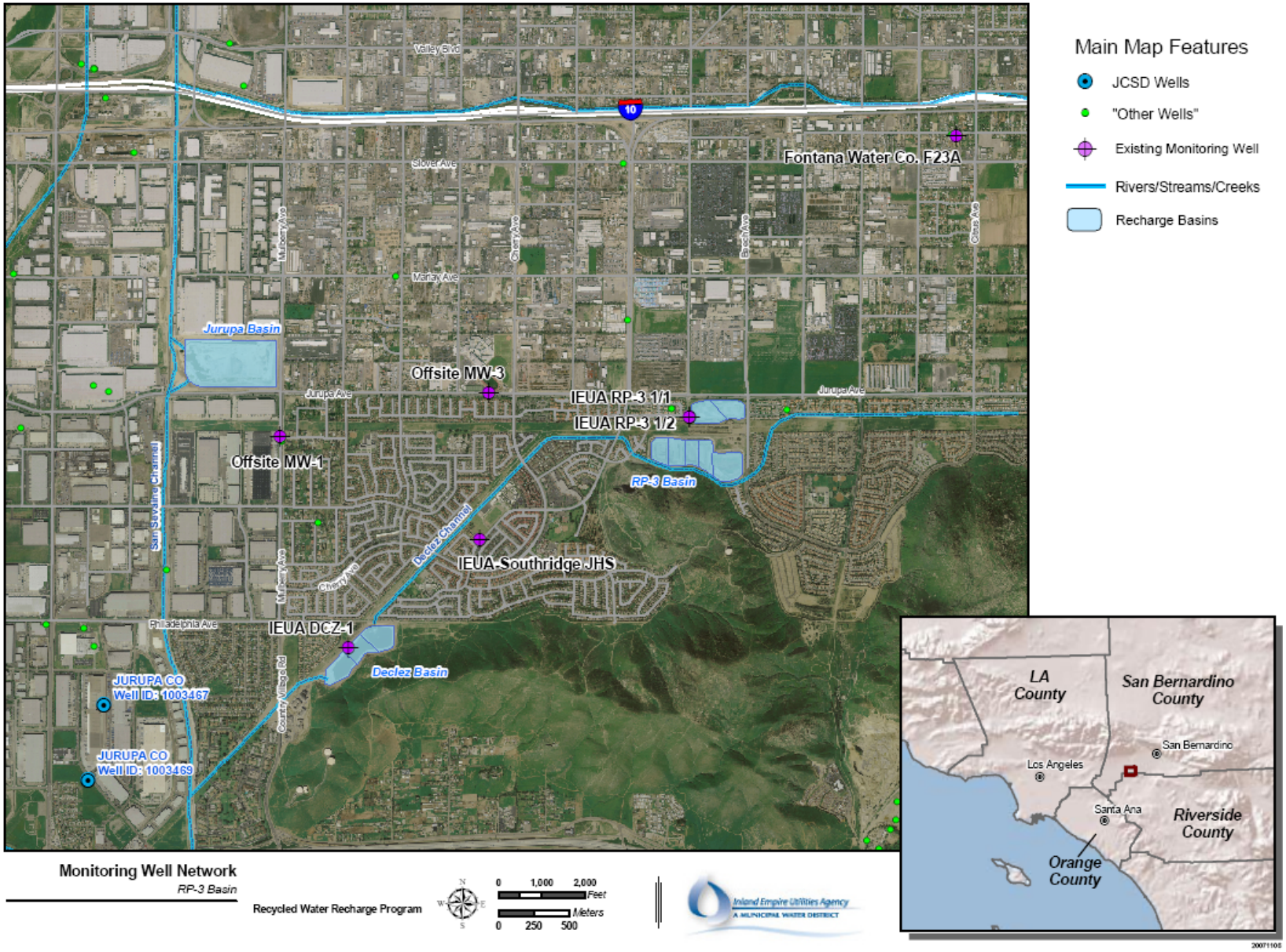

Figure No. 3-7: San Sevaine & Victoria Basins Monitoring Well Network