5.14 UTILITIES AND SERVICE SYSTEMS

Existing conditions information presented in this section is based on project-specific facilities reports and coordination with affected public utility agencies. Specific references are identified as relevant. This section of the recirculated DEIR addresses the following public utilities; the service provider is noted parenthetically:

- Water Supply and Distribution Systems (Irvine Ranch Water District)
- Wastewater Treatment and Collection (Irvine Ranch Water District)
- Solid Waste (Orange County Integrated Waste Management District)
- Electricity (Southern California Edison)
- Natural Gas (Southern California Gas Company)
- Communications (SBC Communications and Cox Communications Orange County, Inc.)

In addition to the utilities and service systems noted above, this DEIR also includes analysis of storm drain facilities in Section 5.7, *Hydrology and Water Quality*.

The analysis in this section is based in part on the following technical reports:

- *Irvine Business Complex Redevelopment Sub-Area Master Plan* (SAMP), Irvine Ranch Water District, 2008.
- *Urban Water Management Plan,* Irvine Ranch Water District, 2005.
- *Regional Urban Water Management Plan,* Metropolitan Water District of Southern California, *2005,*
- *Water Supply Assessment for Irvine Business Complex Vision Plan and Residential Mixed Use Overlay Zone*, Irvine Ranch Water District, 2008.

A complete copy of the Water Supply Assessment is included in Appendix P. The SAMP is available for review at the City of Irvine, Community Development Department.

5.14.1 Water Services

5.14.1.1 Environmental Setting

The Irvine Ranch Water District (IRWD) provides potable and recycled water service to the IBC project area. IRWD is a multiservice agency that provides potable and nonpotable water supply and wastewater collection, treatment, and disposal services to a population of approximately 266,000, covering an area of 84,610 acres (132 square miles). IRWD, which serves all of the City of Irvine and a majority of the City of Lake Forest, is bounded by the Cities of Tustin, Santa Ana, Costa Mesa, and Newport Beach to the west; the Pacific Ocean and Laguna Beach to the south; the Santa Ana Mountains to the north; and the City of Lake Forest to the east. IRWD is a member agency of the Orange County Water District (OCWD), and is the largest constituent agency of the Municipal Water District of Orange County (MWDOC).

IRWD prepares two planning documents to guide water supply decision making. IRWD's principal planning document is its Water Resources Master Plan (WRMP), a comprehensive document compiling data and analyses that IRWD considers necessary for its planning needs. IRWD also prepares an Urban Water Management Plan (UWMP), a document required by statute. The UWMP is based on the WRMP, but contains defined elements as listed in the statute (Water Code §10631, et seq.), and, as a result, is more limited than

the WRMP in the treatment of supply and demand issues. Therefore, IRWD primarily relies on its most recent WRMP.

Water Distribution Systems

Potable Water Distribution System

IRWD is the jurisdictional agency that provides potable water services to the City of Irvine, including the project area. The potable water system within the IBC has over 100 miles of water pipe, ranging from 4 inches to 54 inches in diameter. The entire network of potable water distribution piping within the IBC is in hydraulic pressure service Zone 1, which is supplied primarily from the 15 million gallon Central Zone 1 Tank. Central Tank 1 floats above Zone 1 and maintains a water level of 290 feet, providing the hydraulic pressure that supplies the gravity system in the IBC. Zone 1 also has pressure-reducing valve connections to higher pressure Zones 2 and 3 plus turnout connections to Orange County. The Zone 1 Tank is approximately 5 to 6 miles away from the IBC. See Figure 5.14-1 for existing potable water systems by pipe diameter.

A Sub-Area Master Plan (SAMP) was prepared by IRWD for the IBC in 2008. The existing potable water system was analyzed for deficiencies. The SAMP found no areas with low pressures. A substantial portion of the IBC system has high pressures in excess of 100 pounds of pressure per square inch (psi). In general, all areas north of Alton Parkway, as well as the area bounded by Michelson Avenue, Jamboree Road, and I-405 have high pressures. Various junctions throughout the system also have high pressures. Two pipe segments have velocities greater than 8 feet per second. Pipe ID 190 and pipe ID 50008 are 12-inch pipe segments at the intersection of Barranca Parkway and Van Karman Avenue, connecting the 54-inch transmission pipeline from the Dyer Road Well Field to the 12-inch distribution pipelines within the IBC system.

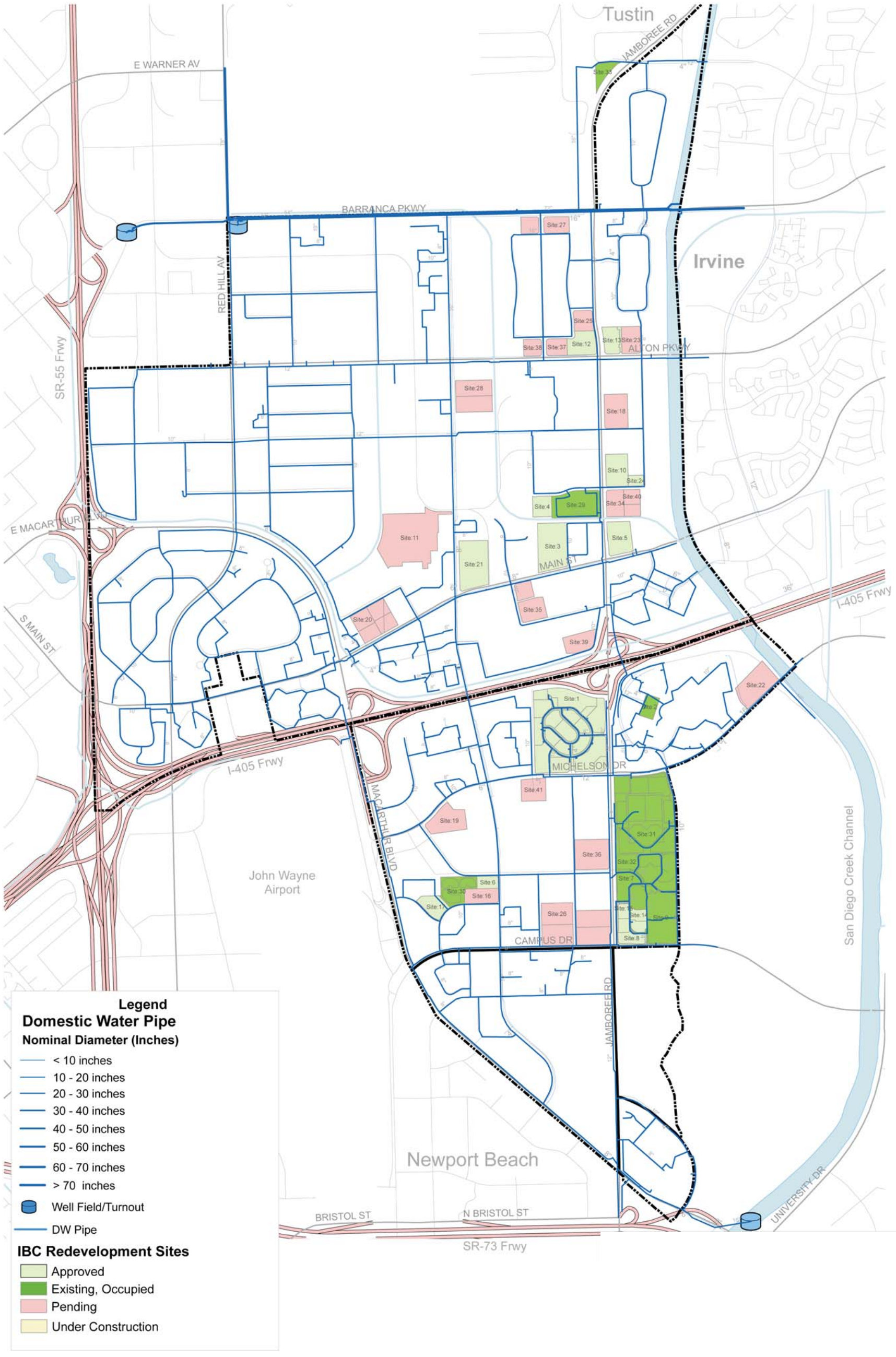
Nonpotable Water Distribution System

IRWD's nonpotable system is comprised of both reclaimed water and untreated water. The nonpotable water system within the IBC has approximately 18 miles of reclaimed water piping. The distribution system ranges in size from 4 inches to 36 inches in diameter, although diameters of less than 4 inches are used to connect service lines to the distribution system. The ground surface elevation in the vicinity of the nonpotable system ranges between approximately 20 feet and 65 feet above sea level. The entire network of nonpotable water distribution piping in the IBC is in hydraulic pressure service Zone A Central, which is supplied from the Zone A South Tank and the Zone A North Tank. The Zone A Tanks float above the pressure zone and maintain a water surface level of 330 feet, providing the hydraulic pressure that supplies the gravity system within the IBC. Central Zone A also has pressure-reducing valve connections to higher pressure Zone B.

As part of the IBC SAMP, the nonpotable water system was analyzed under average-day and peak-hour demand conditions. No deficiencies were identified.

The nonpotable water system is supplied by three primary sources: reclaimed water produced at the Michelson Water Reclamation Plant (MWRP) and Los Alisos Water Reclamation Plant (LAWRP), untreated water purchased from Metropolitan Water District of Southern California (MWD), and groundwater from the Irvine Subasin. The nonpotable water supply system, shown on Figure 5.14-2, consists of two subsystems: a reclaimed water system that delivers reclaimed water, supplemental untreated water, and limited nonpotable groundwater to landscape, agricultural irrigation customers, high rise office buildings for nonpotable water usage (e.g., toilets), and various industrial users; and an untreated water system that delivers imported untreated water and local runoff via the Irvine Lake Pipeline to agricultural customers and to supplement the reclaimed water system. Irvine Lake provides storage and captures local runoff for the untreated water system, and Sand Canyon Reservoir and Rattlesnake Reservoir provide storage for the reclaimed water system.

Existing Potable Water Distribution Systems



Source: IBC SAMP 2008

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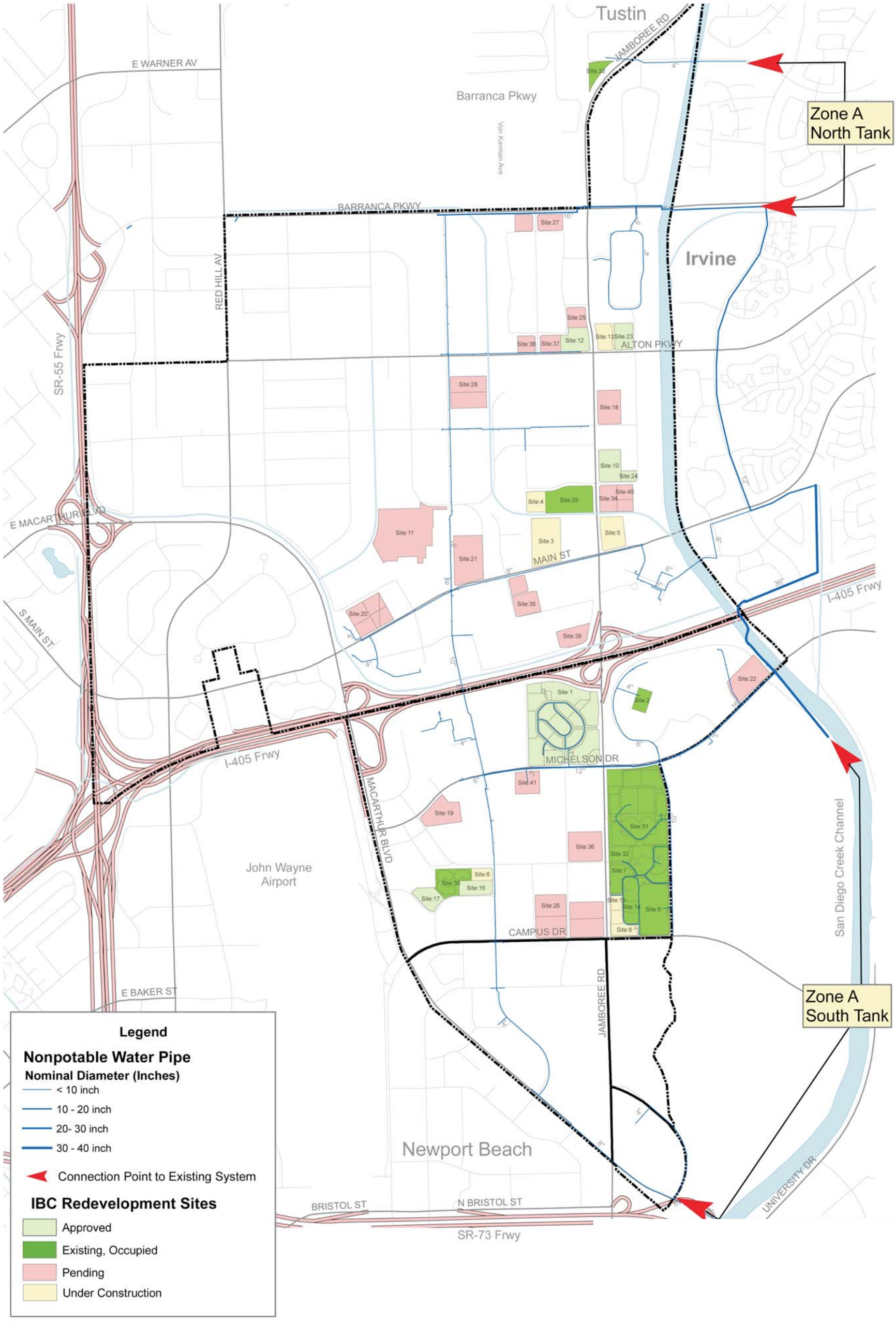
Existing Nonpotable Water Distribution System



Source: IBC SAMP 2008

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MWRP – Wastewater is conveyed to the MWRP for treatment and reuse. The treated effluent meets the water quality standards set forth in the California Administrative Code (CAC), Title 22, Division 4 (Title 22) for use as reclaimed water.

LAWRP – The nominal dry weather treatment capacity of the LAWRP is 7.5 mgd for secondary treatment and 5.5 mgd for reclaimed water production. In 2001, average influent flow into LAWRP was 4.4 mgd. The efficiency of LAWRP reclaimed water production has been estimated at 97 percent of the wastewater inflow.

Irvine Lake – MWD untreated water is conveyed via the Santiago Lateral of the Lower Feeder to Irvine Lake (also known as Santiago Reservoir) for storage. Irvine Lake is owned and operated by IRWD and the Serrano Irrigation District. In addition, local storm flow runoff is captured and stored in Irvine Lake, which has a maximum storage capacity of 25,000 acre feet at the spillway elevation of 790 feet.

Irvine Lake Pipeline – The ILP, built in 1978 by IRWD and MWDOC, conveys MWD untreated water and local runoff from Irvine Lake to Lambert Reservoir. Due to hydraulic limitations, IRWD's available supply rate is estimated to be about 65 cubic feet per second (cfs), based on a maximum reservoir elevation of 790 feet.

Irvine Subasin Groundwater – Existing use of this groundwater by IRWD has been limited to supply augmentation for the reclaimed water system, primarily due to the limitation imposed by the Irvine Subbasin Agreement

Seasonal Storage – MWRP, Irvine Subbasin wells, and the ILP are the supply sources to the reclaimed water system. Nonpotable system demands vary monthly from about 30 percent of average in the winter to about 175 percent of average in July. During low demand periods, surplus production from the supply sources is stored in reservoirs to meet peak demands in the summer months. Rattlesnake Reservoir and Sand Canyon Reservoir provide seasonal storage for the reclaimed water system, with storage capacities of 900 and 750 acre-feet, respectively. Runoff into the reservoirs provides a highly variable amount additional water supply, but essentially substitutes for stored reclaimed water.

Water Supply

Water available to IRWD comes from groundwater pumped from the Orange County groundwater basin (including the Irvine Subbasin); captured local (native) surface water; reclaimed wastewater, and supplemental imported water supplied by MWD through the MWDOC. The supply-demand comparisons in this section are broken down among the various sources, and are further separated into potable and nonpotable water.

For comparison with demands, water supplies are classified as “currently available” or “under development.”

- Currently available supplies are those presently operational and those that will be operational within the next several years. Supplies expected to be operational in the next several years are those that have completed or substantially completed the environmental and regulatory review process and have the necessary contracts (if any) in place to move forward. These supplies are in various stages of planning, design, or construction.

- In general, supplies under development may necessitate the preparation and completion of environmental documents, regulatory approvals, and/or contracts prior to full construction and implementation.

A list of the currently available and under development supplies of both potable and nonpotable water can be found in the Water Supply Assessment (WSA) (EIR Appendix P). Due to the number of contracts, statutes, and other documents comprising IRWD's written proof of entitlement to its water supplies, in lieu of attachment of such items, they are identified by title and summarized in Section 2(b) of the WSA, Written Contracts/Proof of Entitlement. Copies of the summarized items are available for review at the City and can be obtained from IRWD.

IRWD is also evaluating the development of additional supplies that are not included in either currently available or under development supplies for purposes of this assessment. As outlined in the WRMP, prudent water supply and financial planning dictates that development of supplies be phased over time, consistently with the growth in demand.

Table 5.14-1 shows IRWD's water supply sources. IRWD does not allocate particular supplies to any project, but identifies total supplies for its service area.

Table 5.14-1
IRWD's Existing Sources of Water Supply

	Max Day (cfs)	*Avg. Annual (afy)*	*Annual by Category (afy)*
Current Supplies			
Potable – Imported			
East Orange County Feeder No. 2	41.4	16,652[1]	
Allen-McColloch Pipeline*	64.7	26,024[1]	
Orange County Feeder	18.0	7,240[1]	49,916
Potable – Groundwater			
Dyer Road Wellfield	80.0	28,000[2]	
Deep Aquifer Treatment System	12.0	8,300	
Irvine Desalter	10.6	5,640[3]	41,940
Total Potable Current Supplies	**226.7**		**91,856**
Nonpotable – Reclaimed Water			
MWRP (18 mgd)	23.9	17,340[4]	
LAWRP (5.5 mgd)	8.3	5,975[4]	23,315
Nonpotable – Imported			
Baker Aqueduct	52.7	15,262[5]	
Irvine Lake Pipeline	65.0	9,000[6]	24,262
Nonpotable – Groundwater			
Irvine Desalter	5.4	3,898[7]	3,898
Nonpotable Native			
Irvine Lake	5.5	4,000[8]	4,000
Total Nonpotable Current Supplies	**160.8**		**55,475**
Total Combined Current Supplies	**387.5**		**147,331**

Table 5.14-1
IRWD's Existing Sources of Water Supply

	Max Day (cfs)	Avg. Annual (afy)	Annual by Category (afy)
Supplies Under Development			
Potable Supplies			
Wells 21 and 22	6.0	5,000	
Wells 51, 52, and 53	12.0	6,500	
Anaheim wellfield	12.0	10,000	
Tustin Legacy wells	9.0	5,400	
Tustin Ranch wells and well 106	10.0	6,500[9]	33,400
Total Potable Under Development Supplies	**49.0**		
Nonpotable Supplies: Future MWRP & LAWRP Reclaimed	20.0	14,450[10]	14,450
Total Under Development	**118.0**		**47,850**
Potable Supplies	275.7		125,256
Nonpotable Supplies	180.7		69,925
Total Supplies (Current and Under Development)	**456.5**		**195,181**

afy = acre feet per year
[1] Based on converting maximum day capacity to average by dividing the capacity by a peaking factor of 1.8 (see Footnote 3, page 22 of the WSA).
[2] Contract amount - See WSA page 23, Potable Supply-Groundwater(iii) (EIR Appendix P).
[3] Contract amount - See WSA page 26, Potable Supply-Groundwater (iv) and (v) (EIR Appendix P). Maximum day well capacity is compatible with contract amount.
[4] MWRP 18 mgd treatment capacity (17,400 afy RW production) and LAWRP 5.5 mgd tertiary treatment capacity (5,975 afy)
[5] Based on converting maximum day capacity to average by dividing the capacity by a peaking factor of 2.5 (see Footnote 3, WSA page 22). (EIR Appendix P).
[6] Based on IRWD's proportion of Irvine Lake imported water storage; Actual ILP capacity would allow the use of additional imported water from MWD through the Santiago Lateral.
[7] Contract amount – See WSA page 29, Nonpotable Supply-Groundwater (i) and (ii). (EIR Appendix P). Maximum day well capacity (cfs) is compatible with contract amount.
[8] Based on 70 years historical average of Santiago Creek Inflow into Irvine Lake.
[9] Estimated combined capacity of wells.
[10] Future estimated MWRP and LAWRP reclaimed water production.
* 64.7 cfs is current assigned capacity; based on increased peak flow, IRWD can purchase 10 cfs more (see WSA page 23 (b)(1)(iii)). (EIR Appendix P).

Potable Water Supply

Approximately 35 percent of IRWD's domestic water is purchased from the MWD and imported from the Colorado River via the Colorado River Aqueduct and the State Water Project (SWP). The majority of IRWD's imported potable water is supplied from a single source, the MWD Diemer Filtration Plant, located north of Yorba Linda. Typically, the Diemer Filtration Plant receives a blend of Colorado River water from Lake Mathews through the MWD lower feeder and SWP water through the Yorba Linda Feeder. Groundwater now makes up approximately 65 percent of IRWD's total potable water supply depending on a series of local wells, including Dyer Road Wellfield Project and the IRWD's Deep Aquifer Treatment System (DATS).

IRWD's total existing potable water supply and demand (without project) are shown in Table 5.14-2. Forecasts indicate that IRWD will continue to have a supply surplus of potable water through the 2028 horizon year under Normal-, Single Dry- and Multiple Dry-Year conditions.

Table 5.14-2
IRWD Existing Supply and Demand for Potable Water
(afy)

Source	2010	2015	2020	2025	2028
Normal Year					
Current Potable Supplies					
MWD Imported (EOCF#2, AMP, OCF)	41,929	41,929	41,929	41,929	41,929
DRWF/DATS	36,300	36,300	36,300	36,300	36,300
Irvine Desalter	5,640	5,640	5,640	5,640	5,640
Supplies Under Development					
Future Groundwater	18,000	33,400	33,400	33,400	33,400
Maximum Supply Capability	101,869	117,269	117,269	117,269	117,269
Baseline Demand	65,949	84,576	90,738	95,013	95,204
Reserve Supply	**35,920**	**32,693**	**26,531**	**22,256**	**22,065**
Single Dry – Year					
Current Potable Supplies					
MWD Imported (EOCF#2, AMP, OCF)	41,929	41,929	41,929	41,929	41,929
DRWF/DATS	36,300	36,300	36,300	36,300	36,300
Irvine Desalter	5,640	5,640	5,640	5,640	5,640
Supplies Under Development					
Future Groundwater	18,000	33,400	33,400	33,400	33,400
Maximum Supply Capability	101,869	117,269	117,269	117,269	117,269
Baseline Demand	70,565	90,496	97,090	101,663	101,868
Reserve Supply	**31,304**	**26,773**	**20,179**	**15,606**	**15,401**
Multiple Dry – Year					
Current Potable Supplies					
MWD Imported (EOCF#2, AMP, OCF)	41,929	41,929	41,929	41,929	41,929
DRWF/DATS	36,300	36,300	36,300	36,300	36,300
Irvine Desalter	5,640	5,640	5,640	5,640	5,640
Supplies Under Development					
Future Groundwater	18,000	33,400	33,400	33,400	33,400
Maximum Supply Capability	101,869	117,269	117,269	117,269	117,269
Baseline Demand	70,565	90,496	97,090	101,663	101,868
Reserve Supply	**31,304**	**26,773**	**20,179**	**15,606**	**15,401**

Source: IBC WSA 2008
afy = acre feet per year
A full discussion of current and under-development water supply entitlements, water rights, and water service contracts can be found in the WSA.

Nonpotable Water Supply

Reclaimed water, groundwater, and imported water account for IRWD's nonpotable water supply. IRWD's total existing nonpotable water supply and demand (without project) are show in Table 5.14-3. The source of IRWD's groundwater supply is the Lower Santa Ana River Basin. IRWD is an operator of groundwater producing facilities in the Orange County Groundwater Basin.

Forecasts indicate that IRWD will continue to have a supply surplus of nonpotable water through 2028 under Normal-, Single Dry- and Multiple Dry-Year conditions.

Table 5.14-3
IRWD Existing Supply and Demand for Nonpotable Water
(afy)

Source	2010	2015	2020	2025	2028
Normal – Year					
Current Nonpotable Supplies					
Existing MWRP and LAWRP	18,657	18,657	18,657	18,657	18,657
MWD Imported (Baker, ILP)	20,380	20,380	20,380	20,380	20,380
Irvine Desalter	3,898	3,898	3,898	3,898	3,898
Native Water	4,000	4,000	4,000	4,000	4,000
Supplies Under Development					
Future MWRP and LAWRP	10,100	10,100	10,100	10,100	10,100
Maximum Supply Capability	57,035	57,035	57,035	57,035	57,035
Baseline Demand	40,172	38,598	39,480	40,893	40,977
Reserve Supply	**16,863**	**18,437**	**17,555**	**16,142**	**16,142**
Single Dry – Year					
Current Nonpotable Supplies					
Existing MWRP and LAWRP	18,657	18,657	18,657	18,657	18,657
MWD Imported (Baker, ILP)	20,380	20,380	20,380	20,380	20,380
Irvine Desalter	3,898	3,898	3,898	3,898	3,898
Native Water	1,000	1,000	1,000	1,000	1,000
Supplies Under Development					
Future MWRP and LAWRP	10,100	10,100	10,100	10,100	10,100
Maximum Supply Capability	54,035	54,035	54,035	54,035	54,035
Baseline Demand	42,984	41,300	42,244	43,755	43,846
Reserve Supply	**11,051**	**12,737**	**11,791**	**10,280**	**10,189**
Multiple Dry – Year					
Current Nonpotable Supplies					
Existing MWRP and LAWRP	18,657	18,657	18,657	18,657	18,657
MWD Imported (Baker, ILP)	20,380	20,380	20,380	20,380	20,380
Irvine Desalter	3,898	3,898	3,898	3,898	3,898
Native Water	1,000	1,000	1,000	1,000	1,000
Supplies Under Development					
Future MWRP and LAWRP	10,100	10,100	10,100	10,100	10,100
Maximum Supply Capability	54,035	54,035	54,035	54,035	54,035
Baseline Demand	42,984	41,300	42,244	43,755	43,846
Reserve Supply	**11,051**	**12,737**	**11,791**	**10,280**	**10,189**

Source: IBC WSA 2008
afy = acre feet per year
A full discussion of current and under-development water supply entitlements, water rights, and water service contracts can be found in the WSA.

Reliability of Long-Term Water Supply

Southern California faces the challenge of satisfying its water requirements and securing its firm water supplies. Increased environmental regulations and the collaborative competition for water from outside the region have resulted in reduced supplies of imported water. Continued population and economic growth correspond to increased water demands in the region, putting an even larger burden on local supplies. A number of significant areas affecting the uncertainty for delivery reliability are discussed below. Major sources of uncertainty include Delta pumping restrictions, organism decline, climate change and sea level rise, and levee vulnerability to floods and earthquakes.

On June 5th, 2008, Governor Arnold Schwarzenegger declared a statewide drought and directed state agencies and departments to take specified actions. Governor Schwarzenegger proclaimed a state of emergency on February 27, 2009, and directed all state government agencies to utilize their resources, implement a state emergency plan, and provide assistance for people, communities, and businesses impacted by the drought. 2008, marked the fourth driest spring on record, coming off of a record dry year.

The reliability of the IRWD's water supply currently depends on the reliability of both groundwater and imported water supplies, which are managed and delivered by the Orange County Water District and MWD, respectively.

Metropolitan Water District of Southern California

MWD has a 5,200-square-mile service area and imports about half of the water used in southern California. The other half includes local surface and groundwater supplies, recycled water, and water imported from the Owens Valley by the City of Los Angeles. Urban water demands use less than 20 percent of California's developed water supply, and agriculture uses more than 80 percent. MWD imports water from the Colorado River and, through a contract with the State of California, from northern California via the SWP. The SWP, MWD's Colorado River Aqueduct, and MWD's local water facilities and programs have many layers that provide reliability. The SWP includes the very large San Luis Reservoir, near the City of Los Banos in Central California, and, closer to southern California, Pyramid and Castaic Lakes on the west branch, and Silverwood Lake and Lake Perris on the east branch of the SWP. MWD, in turn, has over a million acre-feet of surface water storage in southern California, including the new Diamond Valley Reservoir, in addition to large groundwater storage projects.

MWD Long-Term and Reliability Planning

MWD's framework for regional water resource planning for southern California is the Integrated Water Resources Plan (IRP).The IRP is a long-term water resource strategy for the six-county area served by MWD, which covers parts of Ventura, Los Angeles, Riverside, San Bernardino, Orange, and San Diego Counties. The IRP was first adopted in 1996 and was updated in 2004. It sets regional goals for the development of MWD's various water resources and calls for investments in water conservation, recycling, groundwater treatment, storage and transfers. In return, the IRP brings supply diversity and stability. The IRP Update showed that southern California continued to exceed projections laid out in the original IRP approved in 1996. The IRP Update also recommended development of a supply buffer of 500,000 acre-feet, half of which would come from local resources, and the other half through water transfers and storage programs outside MWD's service area. This supply buffer allows MWD and its member agencies to manage the uncertainties and unreliability of supplies and demands.

As part of the approval of the IRP Update, the MWD Board directed staff to provide an annual report on the progress toward implementing the IRP targets. The 2007 Integrated Water Resources Plan Implementation Report was issued on October 9, 2007. MWD noted various uncertainties that may affect long-term water supply for southern California. Specifically, MWD stated these issues have revolved primarily around current and future SWP supplies and operations due to impacts of actions to protect endangered fisheries, and emerging challenges to a planning approach to global warming and climate change. To address these uncertainties in a comprehensive manner, MWD brought forth a strategy to update the long-term IRP in December 2007. Through this process, it is expected that changes to the IRP will be identified and that direction to address the range of new uncertainty will be established. The MWD 2007 IRP Implementation Report demonstrates that while changes occur in all resource areas, MWD is able to maintain supply reliability through its diversified water resources portfolio.

The IRP upholds MWD's balanced approach to ensuring diversity and reliability of local and imported supplies. MWD has found that current practices of diversifying water supplies and securing supply reserves allow MWD and its member agencies to adjust to changes in demands and supplies and to maintain a high degree of reliability. Planned water supply sources include resource improvement strategies and additions currently under development by MWD.

Delta Smelt

The Delta smelt is a federally and state-listed threatened fish species that inhabits the estuaries of the Bay-Delta region. In May 2007, a federal court invalidated the biological opinion issued by the US Fish and Wildlife Service for operations of the SWP and Central Valley Project with regard to the Delta smelt. On August 31, 2007, the federal court ordered interim operating rules until a new biological opinion is approved. Under the ruling, operational limits on delta pumping are in place from the end of December, when fish are about to spawn, until June, when the smelt migrate. The federal ruling and protective measures will be in effect until the biological opinion is rewritten. According to the MWD, the protective measures will have an effect on future SWP operations and supplies. According to the 2007 IRP Implementation Report, based on initial estimates, MWD could see as much as up to 22 percent reduction, on average, of its SWP supplies in 2008 and beyond. In addition to the interim remedies and the proceedings to address immediate environmental concerns, the Delta Vision process and the Bay-Delta Conservation Plan process are defining long-term solutions for the Delta. The Bay-Delta Conservation Plan is expected to be completed by the end of 2010. Prior to the court decision, MWD's Board approved a Delta Action Plan in May 2007 that that described short-, mid- and long-term conditions and the actions to mitigate potential supply shortages and to develop and implement long-term solutions.

Currently, the IRP Update is scheduled to be completed in 2009. The planning horizon for the 2009 IRP Update will be extended from 2025 to 2035.The update will address water supply uncertainties related to endangered fisheries in the California Bay-Delta, consider long-term facility options on the SWP, and revisit MWD's water supply development targets and action plans in light of emerging SWP and climate change issues. The IRP is an adaptive planning framework, and with the adopted annual implementation reporting and five-year updating cycle, MWD and its member agencies will continue to refine and revise the resource targets as new information and technologies become available.

MWD Shortage Allocation Plan

On the regional level, MWD has taken a number of actions to secure a reliable water source for its member agencies. MWD recently adopted a water supply allocation plan (WSAP) for dealing with potential shortages, which takes into consideration the impact on retail customers and the economy, changes and losses in local supplies, the investment in and development of local resources, and conservation achievements. The possible range of the reduction is 5 to 30 percent. Under MWD's shortage allocation approach, water would not be physically denied to an agency, but would be priced at a significant penalty level above the allocation. Development of an allocation would establish the amount of water available at the nonpenalty rate. The penalty rate is expected to be two to three times the firm rate. In January 2009, MWD estimated that the chance of needing to implement some level of rationing under the WSAP in July was approximately 1 in 2. With the release of the biological opinion and the dry conditions in January, MWD issued an update of water supply impacts on the SWP at its February Board meeting. With precipitation and snowpack significantly below normal through January, the range of potential SWP allocations expected for 2009 significantly decreased. In February, MWD estimated that the chances of implementing the WSAP had increased to 3 in 4. With the heavy February precipitation, the chances of WSAP implementation are likely now closer to 1 in 2.

MWD Board of Directors is waiting until April 2009 before making a final decision on implementing the WSAP allocation to ensure that the allocation level is appropriate.

MWD is in the process of implementing their Interim Agricultural Water Program Reduction Guidelines (IAWP). The IAWP, established in 1994, provides for the delivery of surplus water for agricultural purposes at a discounted rate. In exchange for the discount, MWD may reduce IAWP deliveries up to 30 percent prior to imposing mandatory allocations under the WSDM Plan. On October 22, 2007, the MWD officially notified its member agencies of its intention to implement a 30 percent reduction in deliveries of 2008 and beyond agricultural water supplies under its IAWP.

Additional actions taken by MWD during the first half of 2008 include the adoption of a $1.9 billion spending plan, increased rates and charges, and the funding of a new reservoir to benefit Colorado River supply capabilities.

The California Department of Water Resources (DWR) has established a 2009 Drought Water Bank to help facilitate the exchange of water throughout the state and assist water suppliers like MWD at risk of experiencing drought-related shortages and requiring supplemental supplies to meet anticipated demands.

Climate Change

The DWR released the report, "Progress on Incorporating Climate Change into Management of California's Water Resources" (July 2006), considering the impacts of climate change on the state's water supply. DWR emphasizes that "the report represents an example of an impacts assessment based on four scenarios defining an expected range of potential climate change impacts." DWR's major goal is to extend the analysis for long-term water resource planning from "assessing impacts" to "assessing risk." The report presents directions for further work in incorporating climate change into the management of California's water resources. Emphasis is placed on associating probability estimates with potential climate change scenarios in order to provide policy makers with both ranges of impacts and the likelihoods associated with those impacts. DWR's report acknowledges "that all results presented in this report are preliminary, incorporate several assumptions, reflect a limited number of climate change scenarios, and do not address the likelihood of each scenario. Therefore, these results are not sufficient by themselves to make policy decisions."

Potential climate change impacts on state, regional, and local water supplies and relevant information for the Orange County hydrologic basin and Santa Ana Watershed have not been sufficiently developed at this time to permit IRWD to assess and quantify the effect of any such impact on its conclusions in this assessment. In MWD's anticipated IRP Update, MWD will address emerging challenges and questions on the planning approach with regard to global warming and climate change (MWD Board Information Report, October 9, 2007). When MWD's IRP Update is completed, IRWD will review this report to determine if supplementation of the assessment is appropriate.

Catastrophic Supply Interruption Planning

MWD cooperated with the DWR in 2005 on a preliminary study of the potential effects of extensive levee failures in the Delta. The study investigated two of a potential range of scenarios and MWD's analysis showed that, due to its investment in local storage and water banking programs south of the Delta, it would be able to supply all firm requirements to its member agencies under both of these scenarios. However, MWD's analysis of a worst-case situation showed that MWD might need to reduce firm deliveries to its member agencies by as much as 10 percent. MWD reported this analysis in the 2005 Regional UWMP. IRWD has addressed supply interruption planning in its WRMP and UWMP.

MWD will continue to rely on the plans and polices outlined in its UWMP and IRP to address water supply shortages and interruptions (including potential shutdowns of SWP pumps) to meet water demands. MWD is engaged in planning processes that will identify solutions that, when combined with the rest of its supply portfolio, should ensure a reliable long-term water supply for its member agencies.

Estimated Impacts on MWD Supplies to IRWD

IRP Reductions

Although MWD is working on the IRP Update, it is not yet available. In the interim, IRWD has compiled information from the MWD 2007 IRP Implementation Report and MWD's 2005 Regional UWMP to provide information on how MWD's evaluation of the effects of recent events on its regional supply assessments could potentially affect IRWD's supplies from MWD. The WSA evaluation provides an interim review of MWD water supplies. When MWD's IRP Update is completed, IRWD will review the WSA to determine if supplementation of the assessment is appropriate.

Based on IRWD's evaluation of MWD's SWP supplies, IRWD estimates that the 22 percent used by MWD's October report as a potential reduction of MWD's SWP supplies conservatively translates to approximately 16 percent reduction in all of MWD's imported supplies over the years 2010 through 2028. For this purpose, it is assumed that MWD's total supplies consist only of imported SWP and Colorado deliveries. As shown in MWD's Regional UWMP (Tables A.3–7), SWP deliveries on average over the 20-year period are 1,752,000 acre-feet, and Colorado average supplies are 656,000 acre-feet. A 22 percent reduction of SWP supplies equates to 385,400 acre-feet which is 16 percent of MWD's total imported supplies. Based on this estimate, this assessment projects a 16 percent reduction in MWD supplies available to IRWD for the years 2010 through 2028, using IRWD's connected capacity without any water supply allocation imposed by MWD. This reduction in MWD supplies is reflected in the analysis of Normal-, Single Dry-, and Multiple Dry-Year conditions for potable and nonpotable water through the 2028 horizon year (reflected in Tables 5.14-2, and 5.14-3, and the environmental impact assessment in Section 5.14.3.1).

Allocation Cutback or Catastrophic Supply Interruption

As an alternative means of analyzing the 22 percent stated reduction, Table 5.14-4 shows IRWD estimated supplies in all of the 5-year increments (Normal-, Single-, and Multiple-Dry Year) under a short-term MWD allocation scenario whereby MWD declares Shortage Stage 2 and a 10 percent cutback is applied to IRWD's actual usage rather than its connected capacity. However, it is likely that such a scenario would only be temporary. Under these scenarios, IRWD may need to supplement supplies with production of groundwater, which can exceed the applicable basin production percentage on a short-term basis, providing additional reliability during dry years or emergencies. In addition, if needed, IRWD could impose measures under its shortage contingency plan as described in the UWMP. Table 5.14-4 compares projected potable water supplies and demands (without project) in all of the five year increments, under a temporary MWD allocation scenario.

IRWD's above approach is conservative, in that MWD reports that it has made significant progress in other water resource categories such as transfers, groundwater storage, and developing other local resources, and supplies will be available from these resources over the long-term.

Table 5.14-4
IRWD Existing Supply and Demand for Potable Water Under Temporary MWD Allocation (afy)

Source	2010	2015	2020	2025	2028
Normal – Year					
Current Potable Supplies					
MWD Imported (EOCF#2, AMP, OCF)	25,000	26,275	27,616	29,024	29,608
DRWF/DATS	36,300	36,300	36,300	36,300	36,300
Irvine Desalter	5,640	5,640	5,640	5,640	5,640
Supplies Under Development					
Future Groundwater	18,000	33,400	33,400	33,400	33,400
Maximum Supply Capability	84,940	101,615	102,956	104,364	104,948
Baseline Demand	65,949	84,576	90,738	95,013	95,204
Reserve Supply	**18,991**	**17,039**	**12,218**	**9,351**	**9,744**
Single Dry – Year					
Current Potable Supplies					
MWD Imported (EOCF#2, AMP, OCF)	25,000	27,589	28,968	30,417	31,938
DRWF/DATS	36,300	36,300	36,300	36,300	36,300
Irvine Desalter	5,640	5,640	5,640	5,640	5,640
Supplies Under Development					
Future Groundwater	18,000	33,400	33,400	33,400	33,400
Maximum Supply Capability	84,940	102,929	104,308	105,757	107,278
Baseline Demand	75,505	90,496	97,090	101,663	101,868
Reserve Supply	**9,435**	**12,433**	**7,218**	**4,094**	**5,410**
Multiple Dry – Year					
Current Potable Supplies					
MWD Imported (EOCF#2, AMP, OCF)	25,000	27,589	28,968	30,417	31,938
DRWF/DATS	36,300	36,300	36,300	36,300	36,300
Irvine Desalter	5,640	5,640	5,640	5,640	5,640
Supplies Under Development					
Future Groundwater	18,000	33,400	33,400	33,400	33,400
Maximum Supply Capability	84,940	102,929	104,308	105,757	107,278
Baseline Demand	75,505	90,496	97,090	101,663	101,868
Reserve Supply	**9,435**	**12,433**	**7,218**	**4,094**	**5,410**

Source: IBC WSA 2008
A full discussion of current and under-development water supply entitlements, water rights and water service contracts can be found in the WSA.

Orange County Water District

The primary source of water for the City is the Orange County Groundwater Basin. The Orange County Water District (OCWD) is responsible for the protection of water rights to the Santa Ana River in Orange County as well as the management and replenishment of the Basin. OCWD manages production in the basin through financial incentives and establishes the Basin Production Percentage each water year. Total water demand within OCWD was 502,746 acre-feet for the 2006–07 water year (beginning July 1, 2006, and ending June 30, 2007). Since the formation of OCWD in 1933, OCWD has made substantial investment in facilities, basin management, and water rights protection, resulting in the elimination and prevention of adverse long-term "mining" overdraft conditions. OCWD has invested in seawater intrusion control (injection barriers), recharge facilities, laboratories, and basin monitoring to effectively manage the basin. OCWD continues to develop

new replenishment supplies, recharge capacity, and basin protection measures to meet projected production from the basin during average/normal rainfall and drought periods.

OCWD's long-range plans for protecting the water supply and maintaining reliability to its member agencies include:

OCWD Long Term Facilities Plan

OCWD has prepared a draft Long Term Facilities Plan (LTFP) to evaluate potential basin and water quality enhancement projects that may be implemented in the 20-year planning period. The LTFP includes a master list of developed and proposed projects. The various projects are grouped into five categories: 1) recharge facilities, 2) water source facilities, 3) basin management facilities, 4) water quality management facilities, and 5) operational improvements facilities. Each project is evaluated using criteria such as technical feasibility, cost, institutional support, functional feasibility, and environmental compliance. The LTFP will include an implementation plan for the 28 recommended projects over the 20-year planning period.

OCWD Groundwater Management Plan

OCWD finalized its Groundwater Management Plan (GMP) in March 2004. The latest GMP updated versions prepared in 1989 and 1990. The GMP complies with Senate Bill 1938 (SB 1938), passed in 2002, which includes a list of items to be included in a GMP. The GMP's objectives are 1) protecting and enhancing groundwater quality, and 2) cost-effectively protecting and increasing the basin's sustainable yield. Various programs, policies, goals, and projects are defined in the GMP to assist OCWD staff in meeting these objectives. The potential projects described in the GMP are discussed in further detail in the LTFP.

OCWD 2020 Water Master Plan Report

OCWD's Water Master Plan Report (MPR) describes local water supplies and estimates their availability extending to the year 2020. Specifically, OCWD states in its 2020 Water MPR that significant water supply sources will be available in the future for potable, nonpotable, and recharge purposes. The 2020 Water MPR discusses source waters such as imported water from MWD, base flows from the Santa Ana River, treated wastewater through the OCWD/OCSD GWRS program, and possibly desalinated ocean water. The local supplies' availability and projections from the 2020 Water MPR have been revised and are being pursued with the LTFP.

Existing Water Demands

Table 5.14-5 summarizes existing average day water demand factors by land use based on IRWD's UWMP (Table 3-1). The SAMP includes a summary of water demand for some IBC properties based on monthly water billing data (SAMP Section 3.3).

Table 5.14-5
Existing Water Demand by Land Use

Land Use	Units	Water Demand Factor [1]	Total Demand in Gallons Per Day (GPD)	Total Demand in Acre-Feet Per Year
Residential	5,011 du	200 gal/du/day	1,002,200	1,122
Commercial	1,341,000 sf	220 gal/ksf/day	295,020	330
Commercial-Hotel	2,496 rooms	200 gal/room/day	499,200	559
Office and Industrial	41,430,000 sf	70 gal/ksf/day	2,900,100	3,248
		Total	**4,696,520**	**5,261**

Source: IRWD WRMP
du = dwelling unit
ksf = 1,000 square feet of building area
afy = acre-feet per year
[1] Average Day Demand

Principles Governing CEQA Analysis of Water Supply

In *Vineyard Area Citizens for Responsible Growth, Inc., v. City of Rancho Cordova* (February 1, 2007), the California Supreme Court articulated the following principles for analysis of future water supplies for projects subject to CEQA:

- To meet CEQA's informational purposes, the EIR must present sufficient facts to decision makers to evaluate the pros and cons of supplying the necessary amount of water to the project.

- CEQA analysis for large, multiphase projects must assume that all phases of the project will eventually be built and the EIR must analyze, to the extent reasonably possible, the impacts of providing water to the entire project. Tiering cannot be used to defer water supply analysis until future phases of the project are built.

- CEQA analysis cannot rely on "paper water." The EIR must discuss why the identified water should reasonably be expected to be available. Future water supplies must be likely, rather than speculative.

- When there is some uncertainty regarding availability of future water supply, an EIR should acknowledge the degree of uncertainty, include a discussion of possible alternative sources, and identify the environmental impacts of such alternative sources. Where a full discussion still leaves some uncertainly about the long-term water supply's availability, mitigation measures for curtailing future development in the event that intended sources become unavailable may become a part of the EIR's approach.

- The EIR does not need to show that water supplies are definitely assured because such a degree of certainty would be "unworkable, as it would require water planning to far outpace land use planning." The requisite degree of certainty of a project's water supply varies with the stage of project approval. CEQA does not require large projects, at the early planning phase, to provide high degree of assurances of certainty regarding long-term future water supplies.

- The EIR analysis may rely on existing urban water management plans, so long as the project's new demand was included in the water management plan's future demand accounting.

- The ultimate question under CEQA is not whether an EIR establishes a likely source of water, but whether it adequately addresses the reasonably foreseeable impacts of supplying water to the project.

5.14.1.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on water resources if the project:

U-2 Would require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

U-4 Would not have sufficient water supplies available to serve the project from existing entitlements and resources, and new and/or expanded entitlements would be needed.

The above Appendix G Guidelines are applied within an elaborate statutory framework. The Urban Water Management Planning Act, enacted in 1984 (Water Code 10610 et seq.), requires urban water suppliers to develop written UWMPs, which generally include water supply and demand (existing and projected), water conservation measures, and water supply reliability and water shortage contingency measures. UWMPs must address a 20 year planning horizon.

Pursuant to SB 610/221, a WSA must be prepared by the supplier of water for any project subject to CEQA, involving, among other things, development of 500 or more residential units. The WSA must be included in the CEQA review for the proposed project. Since a project may be approved even if a WSA reveals an inadequate supply (subject to the review standards set forth in the Vineyard decision of the California Supreme Court), a verification is required at the tentative map or parcel map stage. If a water supply verification reveals inadequate supplies, the project may not proceed until supplies have been identified and secured. (Government Code 66473.7[b][3]).

5.14.1.3 Environmental Impacts

Existing Plans, Programs, and Policies

The following measures are existing plans, programs, or policies (PPP) that apply to the proposed project and would help to reduce and avoid potential impacts related to water services:

PPP 14-1 **Requirement to Use Recycled Water**: Irvine Ranch Water District (IRWD) will identify customers in a zone identified in the Plan ("the Plan" collectively refers to the Water Resources Master Plan, Sewer Master Plan, Natural Treatment System Master Plan, and addenda thereto) as an area capable of receiving service from the IRWD's recycled water system, and will determine the feasibility of providing recycled water service to these customers. IRWD will also review applications for new permits to determine the feasibility of providing recycled water service to these applicants. If recycled water service is determined by IRWD to be feasible, applicants for new water service shall be required to install on-site facilities to accommodate both potable water and recycled water service in accordance with these Rules and Regulations. IRWD may also require existing customers to retrofit existing on-site water service facilities to accommodate recycled water service. If IRWD does not require the use of recycled water service, the customer may obtain recycled water service upon request but only if IRWD has determined that recycled water service to the customer is feasible and authorizes such use.

PPP 14-2 **Connection Fees**: Future project applicants in the IBC shall enter into agreement or agreements as necessary with IRWD to establish the appropriate financial fair share costs to be borne by the project proponent. Fair share costs may include, but are not limited to, those associated with the preparation of studies and infrastructure expansion necessary to analyze and serve the project.

PPP 14-3 **Fire Flow Analysis:** In accordance with IRWD requirements, each redevelopment project in the IBC must provide a fire flow analysis. If the analysis identifies any deficiencies, the developer will be responsible for any water system improvements associated with the development project required to rectify the deficiencies and meet IRWD fire flow requirements

Project Design Features

There are no specific Project Design Features that relate to potential impacts on water services and facilities.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

IMPACT 5.14-1: THERE ARE ADEQUATE WATER SUPPLY AND DELIVERY SYSTEMS TO MEET PROJECT REQUIREMENTS. [THRESHOLDS U-2 (PART) AND U-4]

Impact Analysis:

Project Water Demands

As shown in Table 5.14-6, the buildout of the IBC would result in an increase in water demand of approximately 3,451 acre-feet per year.

Table 5.14-6
Total Water Demand in the IBC

Land Use	*Units*	*Water Demand Duty Factor*[1]	*Total Demand in Gallons Per Day (GPD)*	*Total Demand in Acre-Feet Per Year*
Residential	17,038 du	200 gal/du/day	3,407,600	3,817
Commercial	1,731,000 sf	220 gal/ksf/day	380,820	428
Commercial- Hotel	3,478 rooms	200 gal/room/day	695,600	779
Office and Industrial	47,056,662 sf	70 gal/ksf/day	3,293,966	3,690
			Total Buildout Demand	**8,712**
			Existing Water Demand	5,261
			Increase from Existing [2]	**3,451**

Source: IRWD UWMP 2005
du = defined as dwelling unit
ksf = 1,000 square feet of building area
[1]Based on Average Day Demand
[2]Includes cumulative projects that are approved, under construction, pending units, potential units, and density bonus units.

Pending IBC Residential Projects

There are currently 2,250 pending units for which the applications are currently on file with the City, and which are analyzed as part of the project. The SAMP analyzed the domestic water and wastewater collection systems based on a total of 19,552 dwelling units in the IBC, and IRWD's WSA for the IBC assumes a 20,000-residential-unit cap in the IBC. The 2,250 pending units are included in the overall units in the SAMP and IRWD's WSA for the IBC.

Water Delivery Systems

The SAMP analyzed the domestic water and wastewater collection systems based on a total of 19,552 dwelling units in the IBC (consisting of 14,552 "redevelopment project" units with specific locations and an additional 5,000 units with general locations). The additional 5,000 dwelling units were analyzed as a part of a sensitivity analysis to evaluate the water system's performance with additional growth. The sensitivity modeling was conducted to determine what level of development density the existing system could support without requiring upgrades.

As part of the SAMP, a hydraulic model was constructed to perform hydraulic analysis of the existing and future potable systems. The SAMP analyzed a total of 19,552 dwelling units in the IBC, consisting of 14,552 redevelopment projects and the additional 5,000 units. The simulations concluded that three pipes exceed the maximum velocity criteria during future peak-hour conditions and are recommended to be replaced with larger diameter pipes, shown in Table 5.14-7.

Table 5.14-7
Potable Water System Recommended Improvements (Future Condition)
(afy)

Improvement No.	*Pipe ID*	*Existing Pipe Diameter*	*Pipe Length*	*Proposed New Pipe Diameter*
PW1	190	12-inch	45	15-inch
PW2	50008	12-inch	30	15-inch
PW3	47219	12-inch	155	15-inch

Source: IBC SAMP 2008

For nonpotable water, model results indicate that none of the existing pipes need to be improved. The following improvements were recommended to expand the nonpotable water system to redevelopment projects in the IBC as they occur, as shown in Table 5.14-8. The nonpotable system improvements consist of new piping installed to service redeveloped properties as development occurs, and regional transmission lines. The improvements are only for new nonpotable water lines that are to be installed as the IBC develops. The cost of nonpotable system improvements is approximately $2,908,710. The majority of costs are paid for by IRWD, with $106,920 developer contribution for site-specific small pipe improvements (RW7 and RW14) not large enough to be regional transmission lines, if determined by IRWD at the time connection is requested. All nonpotable water improvements are within existing right-of-way. Through the use of its WRMP and SAMP, the IRWD will determine the each project's fair share costs and connection fees associated with servicing their project site. There are 13 water connection districts within the IRWD service boundary. Through the use of these established fees, which are regularly updated, the IRWD is able to ensure that project proponents pay their fair share of costs associated with increased demand for service generated by new development projects. Improvements listed in Table 5.14-7 will occur as the IBC builds out and will be funded through existing water connection fees.

Table 5.14-8
Nonpotable Water System Recommended Improvements (Future Condition)

Improvement No.	Proposed New Pipe Diameter	Pipe Length (Feet)	Location
RW1	6-inch	1,280	Jamboree Rd between Main St and Kelvin Ave
RW2	6-inch	1,040	Kelvin Ave west of Jamboree Rd
RW3	6-inch	710	Martin west of Von Karman Ave
RW4	6-inch	810	Alton Pkwy on both sides of Jamboree Rd
RW5	6-inch	670	Kelvin Ave east of Jamboree Rd
RW6	6-inch	220	Jamboree Rd north of Alton Pkwy
RW7	6-inch	560	Jamboree Rd north of improvement RW6
RW8	4-inch	400	McGaw Ave on both sides of Jamboree Rd
RW9	6-inch	1,010	Michelson Dr on both sides of Bixby
RW10	6-inch	1,380	Teller Ave south of Michelson Dr
RW11	6-inch	330	Martin west of improvement
RW12	6-inch	1,780	Campus Dr between Von Karman and Teller Ave; Teller Ave north of Campus Dr
RW13	6-inch	2,430	McCabe Way south of Morse Ave
RW14	4-inch	480	North of Main Street and west of Von Karman Ave (Off of Von Karman Ave)
RW15	6-inch	2,820	Alton Pkwy west of Von Karman Ave
RW16	6-inch	650	Derian Ave south of McGaw Ave
RW17	6-inch	2,240	Jamboree Rd north of Macarthur Blvd
RW18	6-inch	5,130	Barranca Parkway and Jamboree Road

Source: IBC SAMP 2008
Note:
Improvements RW1 to RW14 are new reclaimed water pipelines to IBC Redevelopment sites. Improvements RW15 to RW18 are new regional reclaimed water transmission lines.

Fire Flow Analysis

Fire flow simulations were run to identify areas where residual pressures may be too low under fire flow conditions. Low residual pressures indicate the inability to provide the required fire flow demands. Fire flow simulations showed that in general, most of the existing IBC potable water system is capable of conveying adequate fire flow volumes and still maintain adequate system residual pressures above 20 pounds per square inch (psi). However, there are notable exceptions, particularly several dead-end water lines. A thorough fire flow analysis of all dead end water lines within the IBC was outside the scope of this analysis; however, dead-end lines in the vicinity of the IBC redevelopment properties were included. Therefore, rather than recommending isolated pipe improvements near only the redevelopment properties, which may or may not address deficiencies in other portions of the IBC, it is recommended that a thorough fire flow analysis be conducted. In accordance with IRWD requirements (see PPP 14-3), each redevelopment project must provide a fire flow analysis. If the fire flow analysis identifies any deficiencies, the developer would be responsible for any water system improvements associated with the redevelopment project required to rectify the deficiencies and meet IRWD fire flow requirements.

Water Supply

As Tables 5.14-9 and 5.14-10 demonstrate, there is sufficient supply capacity for both potable and nonpotable water to accommodate full buildout through 2028, upon completion of under development supplies.

IRWD's estimates are very conservative because the WSA assumes a 20,000 residential unit cap in the IBC. The proposed project has a maximum dwelling unit cap of 15,000, and a total of 2,038 density bonus units allowable in accordance with state law, for a total of 17,038 units.

Table 5.14-9
IRWD Buildout Supply and Demand for Potable Water
(Acre-Feet Per Year)

Source	*2010*	*2015*	*2020*	*2025*	*2028*
Normal-Year					
Maximum Supply Capacity [1, 2]	101,869	117,269	117,269	117,269	117,269
Buildout Demand [3]	65,961	84,774	91,164	95,600	95,813
Reserve Supply	**35,908**	**32,495**	**26,105**	**21,669**	**21,456**
Single Dry-Year					
Maximum Supply Capability	101,869	117,269	117,269	117,269	117,269
Buildout Demand	70,578	90,708	97,545	102,292	102,520
Reserve Supply	**31,291**	**26,561**	**19,724**	**14,977**	**14,749**
Multiple Dry-Year					
Maximum Supply Capability	101,869	117,269	117,269	117,269	117,269
Buildout Demand	70,578	90,708	97,545	102,292	102,520
Reserve Supply	**31,291**	**26,561**	**19,724**	**14,977**	**14,749**

Source: IBC WSA 2008
Notes:
[1] Includes current supplies and supplies under development.
[2] A full discussion of under-development water supply entitlement, water rights, and water service contracts can be found in the WSA.
[3] Full WRMP buildout including project.

Table 5.14-10
IRWD Buildout Supply and Demand for Nonpotable Water
(Acre-Feet Per Year)

Source	2010	2015	2020	2025	2028
Normal Year					
Maximum Supply Capacity [1, 2]	57,035	57,035	57,035	57,035	57,035
Buildout Demand [3]	40,172	38,617	39,513	40,936	41,021
Reserve Supply	**16,863**	**16,863**	**18,418**	**17,522**	**16,014**
Single Dry Year					
Maximum Supply Capability	54,035	54,035	54,035	54,035	54,035
Buildout Demand	42,984	41,320	42,279	43,801	43,892
Reserve Supply	**11,031**	**12,715**	**11,756**	**10,234**	**10,150**
Multiple Dry Year					
Maximum Supply Capability	54,035	54,035	54,035	54,035	54,035
Buildout Demand	42,984	41,320	42,279	43,801	43,892
Reserve Supply	**11,031**	**12,715**	**11,756**	**10,234**	**10,150**

Source: IBC WSA 2008
Notes:
[1] Includes current supplies and supplies under development.
[2] A full discussion of under-development water supply entitlement, water rights, and water service contracts can be found in the WSA.
[3] Full WRMP buildout including project.

Table 5.14-11 demonstrates that IRWD has sufficient supply capacity of potable water under MWD Allocation condition to accommodate full buildout (including the proposed project) through 2028, upon completion of under development supplies. IRWD's estimates are very conservative because the WSA assumes a cap of 20,000 residential units in the IBC. The proposed project has a maximum dwelling unit cap of 15,000, and a total of 2,038 density bonus units allowable in accordance with state law, for a total of 17,038 units.

Table 5.14-11
IRWD Buildout Supply and Demand for Potable Water
Under Temporary MWD Allocation
(Acre-Feet Per Year)

Source	2010	2015	2020	2025	2028
Normal Year					
Maximum Supply Capacity [1, 2]	84,940	101,615	102,956	104,364	*104,948*
Buildout Demand [3]	65,961	84,774	91,164	95,600	95,813
Reserve Supply	**18,979**	**16,841**	**11,792**	**8,764**	**9,134**
Single Dry Year					
Maximum Supply Capability	84,940	102,929	104,308	105,757	107,278
Buildout Demand	75,519	90,708	97,545	102,292	102,520
Reserve Supply	**9,421**	**12,221**	**6,763**	**3,465**	**4,758**
Multiple Dry Year					
Maximum Supply Capability	84,940	102,929	104,308	105,757	107,278
Buildout Demand	75,519	90,708	97,545	102,292	102,520
Reserve Supply	**9,421**	**12,221**	**6,763**	**3,465**	**4,758**

Source: WSA 2008
Notes:
[1] Includes current supplies and supplies under development.
[2] A full discussion of under-development water supply entitlement, water rights and water service contracts can be found in the WSA .
[3] Full WRMP buildout including project.

Conclusion Regarding Regulatory Uncertainties Affecting the Provision of State Water Project Supplies

There are clearly water supply regulatory uncertainties that could significantly impact the delivery of water supplies through the coordinated operations of the SWP. As reviewed in Section 5.14.1.1, MWD, OCWD and IRWD are actively planning for water uncertainties related to the Delta smelt and global climate change. As discussed, there are two major state-sponsored planning efforts, the Delta Vision Task Force and the Bay Delta Conservation Plan program, directed toward resolving these uncertainties. Given the significance of the SWP to public health and safety, as well as to the economy of the State of California, it would appear that major uncertainties will need to be comprehensively addressed in response to the needs of the aquatic environment. At the present time, the Governor and the Legislature are considering possible bond issues that would address the regulatory uncertainties, including measures that would be directed toward improving habitat conditions for the Delta smelt. Although it is not possible at this time to predict the outcome of these efforts with respect to specific levels of water supply under differing climate conditions, both cyclical and long term, the fact that 90 percent of the population of southern California lies within MWD's service area attests to the significance of planning efforts to resolve the regulatory and climate uncertainties. The major water-supply planning efforts currently under way and current MWD efforts to address near-term uncertainties are, taken together, strong indicators that SWP water supply considerations will be comprehensively addressed and very likely resolved in the long term.

5.14.1.4 Cumulative Impacts

Table 5.14-6 shows the project's cumulative demand, which includes projects in the IBC that are approved or under construction. As described above, the total water supplies available to IRWD during MWD Allocation condition, Normal-, Single Dry-, and Multiple Dry-Year conditions within a 20-year projection will meet the projected water demand of the project and of existing and other planned future uses, including, but not

limited to, residential, industrial, and commercial uses. IRWD supply and facilities planning is consistent with the general plans of the land use jurisdictions overlying IRWD. Consequently, presuming future development is generally consistent with existing general plans, IRWD does not anticipate any problems supplying water to any current or future development in the City of Irvine. Therefore, the proposed project's demand for water services would not be cumulatively considerable.

As discussed above, IRWD's water reliability is dependent on OCWD groundwater and MWD imported water reliability. MWD will continue to rely on the plans and polices outlined in its UWMP and IRP to address water supply shortages and interruptions (including potential shut downs of SWP pumps) to meet water demands. MWD is engaged in planning processes both with its member agencies and through its involvement in the State Delta Vision and Bay Delta Conservation planning processes that are intended identify solutions that, when combined with the rest of its supply portfolio, would ensure a reliable long-term water supply for its member agencies.

The nonpotable water system improvements are only for new nonpotable water lines that are to be installed as the IBC develops. Through its SAMP, IRWD has identified areas in need of improvement and has determined the cost of domestic and nonpotable water system improvements. IRWD will fund 100 percent of potable water system improvements and approximately 97 percent of nonpotable water system improvements, with developer contributions totaling a little over $100,000 for site specific, nonregional transmission line improvements,. All nonpotable water improvements are within existing right-of-way. Through the use of its WRMP and SAMP, and water connection districts, the IRWD will determine each project's improvements and connection fees associated with servicing their project site.

5.14.1.5 Level of Significance Before Mitigation

Impact 5.14-1

There are adequate water supply and delivery systems to meet project requirements IRWD does not anticipate any problems supplying water to any current or future development in the City of Irvine. In addition, PPP 14-1 through PPP 14-3 would lessen the impacts on future water supply and IRWD.

5.14.1.6 Mitigation Measures

No mitigation measures are required.

5.14.1.7 Level of Significance After Mitigation

No significant impacts have been identified.

5.14.2 Sewer Services

5.14.2.1 Environmental Setting

Wastewater Treatment and Collection

The IRWD provides wastewater collection service in the City of Irvine. The IBC is in the Orange County Sanitation District (OCSD), tributary zone No. 7 (SD-7). The IBC makes up the entire SD-7 zone with the exception of the Former Tustin Marine Corps Air Station (MCAS), an area of industrial and commercial use west of the MCAS (bounded by Red Hill Avenue, Alton Parkway, Warner Avenue, and State Route 55 SR-55)

and a residential area on the east side of the MCAS (bounded by Warner Avenue, Jamboree Road, Harvard Avenue, and Edinger Avenue).

Wastewater generated in the IBC currently flows to OCSD, and not to IRWD treatment facilities. The IBC wastewater collection system consists of over 40 miles of wastewater piping, ranging between 8- to 66-inches in diameter. There are two IRWD pump stations operational in the IBC: Michelson Pump Station and Main Pump Station. Privately owned pump stations were not modeled, as their operations do not significantly impact the wastewater hydraulics within the IBC. The existing IBC wastewater collection system is shown on Figure 5.14-3.

To fully analyze demands for new and revised land uses and wastewater requirements, the IBC SAMP studied existing and future projected wastewater flows, which are summarized below.

Existing Wastewater Flows

Wastewater generation factors were used to estimate wastewater flow for IBC properties, based on land use. The wastewater generation factors provide annual average wastewater flow based on building space for commercial and industrial use or the number of dwelling units for residential land use. Flow data for the IBC boundary conditions was determined using flow data generated as part of the MWRP and LAWD Flow Routing Study Preliminary Planning Report (Earth Tech 2006).

Average wastewater flows were computed directly from the wastewater generation factors and associated building area or dwelling units, which were determined from the IRWD GIS database. It was assumed that for existing conditions, there are no mixed use properties, and IBC properties with residential land use codes generate flow based on number of du only, while properties with nonresidential land use generate flow based only on the building area.

In order to determine the maximum-month and maximum-day flows, average flows were multiplied by appropriate peaking factors. Peaking factors were determined by analyzing and examining two sources: 1) IRWD Wastewater Treatment Master Plan – Final Report (HDR 2003) and 2) IRWD flow monitoring data analysis performed by Earth Tech (Earth Tech 2006). Total existing wastewater flows generated for each land use are provided in Table 5.14-12.

Table 5.14-12
Existing Wastewater Generation Flows by Land Use

Land Use Code	Land Use Description	Average Flow (gpm)	Maximum-Day Flow (gpm)
1132	Residential – Low Density	0	0
1172	Residential – Medium-High Density [1]	0	0
1182	Residential – High Density	0	0
1192	Residential – High-Rise Density	360	467
1210	Commercial – General Office	451	586
1221	Commercial – Community	760	986
1222	Commercial – Regional	66	85
1230	Commercial – Recreation	1	2
1240	Commercial – Institutional	23	30
1290	Commercial – Hotel	246	319
1300	Industrial [2]	657	854
1900	Vacant	0	0
	Total Flow	**2,564**	**3,329**

Source: IBC SAMP
gpm=gallons per minute
[1] Residential density classification is based on number of dwelling units per acre as shown on SAMP Table 3-1 (Revised 3/4/06) of the Water Resources Master Plan (IRWD 2003)
[2] All industrial land use in the IBC is assumed to be light industrial.

5.14.2.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project:

U-1 Would exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.

U-2 Would require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

U-5 Would result in a determination by the wastewater treatment provider which serves or may serve the project that is has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

5.14.2.3 Environmental Impacts

Existing Plans, Programs, and Policies

The PPP 14-2 measure listed above applies to the proposed project and would help reduce and avoid potential impacts related to wastewater services.

Project Design Features

There are no specific Project Design Features that relate to potential impacts on wastewater services and facilities.

Existing Wastewater Collection System

Source: IBC SAMP 2008

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The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

IMPACT 5.14--2: PROJECT-GENERATED WASTEWATER COULD BE ADEQUATELY TREATED BY THE WASTEWATER SERVICE PROVIDER FOR THE PROJECT. [THRESHOLDS U-1, U-2 (PART), AND U-5]

Impact Analysis: The Irvine Business Complex Redevelopment Sub-Area Master Plan was based on 19,552 dwelling units in the IBC, 2,350 dwelling units in Newport Beach, 450 dwelling units in UCI, and commercial space associated with mixed-use redevelopment sites. As of June 25, 2007, there were 41 redevelopment projects in the IBC in various stages of development. These were used to determine the future land uses and the future wastewater flows. If redevelopment projects change location or densities increase, developers would be required to provide analysis showing the impacts to IRWD's systems.

Wastewater generation factors were used to estimate wastewater flow for IBC properties. The wastewater generation factors provide annual average wastewater flow based on building space for commercial and industrial use or the number of dwelling units for residential land use. Wastewater generation factors used to calculate IBC wastewater were assumed to be equal to the interior water demand factor provided in the 1999 Water Resources Master Plan. Existing and future wastewater flows for redevelopment areas are provided in Table 5.14-13 to illustrate the increase in wastewater flow due to redevelopment.

Table 5.14-13
Existing and Future Wastewater Generation Flows by Land Use

Code	Land Use	Average Flow (gpm)		Maximum-Day Flow (gpm)	
		Existing	Future	Existing	Future
1132	Residential – Low Density	0	82	0	106
1172	Residential – Medium-High Density[1]	0	0	0	0
1182	Residential – High Density	0	0	0	0
1192	Residential – High-Rise Density	360	1,546	467	2,007
1210	Commercial – General Office	451	452	586	587
1221	Commercial – Community	760	911	986	1,182
1222	Commercial – Regional	66	59	85	77
1230	Commercial – Recreation	1	1	2	2
1240	Commercial – Institutional	23	23	30	30
1290	Commercial – Hotel	246	274	319	355
1300	Industrial2	657	528	854	685
1900	Vacant	0	0	0	0
	Total Flow	**2,564**	**3,876**	**3,329**	**5,031**

gpm = gallons per minute

In order to evaluate the conformance of the existing wastewater collection system with the above-noted criteria under current and future (redeveloped) wastewater flows, a hydraulic model was developed. The hydraulic model was developed using H20MAP Software for extended-period simulation of wastewater flows over a 24-hour period. The boundary of the IBC system was examined to identify any inflow/outflow and thereby define the model boundary conditions. The only flow into the IBC taken into account was the Main Street Interceptor flow into the eastern boundary of the IBC at the intersection of Main Street and the San Diego Creek Channel.

The hydraulic analysis was used to identify wastewater collection system deficiencies, defined as pipe segments that do not comply with the IRWD design criteria based on flow model extended-period simulation results for maximum-day flows. Compliance with capacity criteria was based on depth over pipe diameter (d/D) during maximum-day flow conditions. A d/D ratio greater than the criteria ratio indicates a deficiency based on capacity criteria.

The hydraulic analysis for future redeveloped conditions (14,552 units in the IBC) identified the wastewater system deficiencies during maximum-day conditions, including pipe segments that did not meet capacity and maximum velocity criteria (minimum slope deficiencies are the same as existing conditions). Deficiencies that did not meet the capacity criteria are identified in Table 5.14-14.

Table 5.14-14
Future Condition Wastewater System Deficiencies during Maximum-Day Flow

Deficiency No.	Pipe Diameter	Pipe Length	Pipe Location	Deficiency
WW1	10-inch	39 feet	Obsidian north of Michelson Dr.	d/D > Capacity (0.63) (0.50)
WW2	10-inch	225 feet		d/D > Capacity (0.59) (0.50)
WW3	10-inch	32 feet		d/D > Capacity (0.53) (0.50)
WW4	10-inch	335 feet	Dupont Dr. between Von Karman Ave. and Teller Ave.	d/D ≥ Capacity (0.50) (0.50)
WW5	8-inch	310 feet	Dupont Dr. between Bardeen Ave. and Teller Ave.	d/D > Capacity (0.57) (0.50)
WW6	8-inch	310 feet		d/D > Capacity (0.51) (0.50)
WW7	8-inch	250 feet	Martin between Douglas and Campus Dr.	d/D > Capacity (0.53) (0.50)
WW8	10-inch	434 feet	Von Karman Ave. between Main St. and McGaw Ave.	d/D > Capacity (0.54) (0.50)
WW9	12-inch	2,069 feet	MacArthur Blvd. between Birch St. and Newport Pl.	d/D > Capacity (1.00) (0.50)
WW10	12-inch	1,193 feet	MacArthur Blvd. between Dove St. and Newport Pl.	d/D > Capacity (0.67) (0.50)
WW11	12-inch	729 feet	MacArthur Blvd. between Dove St. and Jamboree Rd.	d/D > Capacity (0.69) (0.50)
WW12	12-inch	112 feet	Across Jamboree Rd. to MacArthur Blvd.	d/D > Capacity (0.73) (0.50)

Source: IBC SAMP 2008

The wastewater collection system deficiencies are based on the capacity criteria, which are based on the peak flow conditions during maximum day of the year. Although these deficiencies were considered worst-case scenarios, the SAMP recommends improvements to four pipes outside of the proposed project area. All four improvements are in the Newport Beach area and shown below in Table 5.14-15.

Table 5.14-15
Recommended Improvements

Improvement No.	Existing Pipe Diameter	Pipe Length	Proposed New Pipe Diameter
WW9	12-inch	2,069 feet	15-inch
WW10	12-inch	1,193 feet	15-inch
WW11	12-inch	729 feet	15-inch
WW12	12-inch	112 feet	15-inch

Source: IBC SAMP 2008

Deficient pipes that were not surcharged or did not exceed the capacity criteria by more than 25 percent were not recommended for improvement. These deficiencies were deemed not significant enough to warrant replacing segments of pipe.

Sensitivity Analysis

Sensitivity analysis was performed to estimate the impact of additional build-out of residential developments in the IBC. The SAMP's analysis of full residential buildout of the IBC consists of 5,000 residential dwelling units in addition to the 14,552 redevelopment units in the IBC, for a total of 19,552 units. Three sensitivity analysis scenarios were developed to estimate potential locations and density for full residential development of the IBC. These scenarios were based on existing industrial and commercial areas in the vicinity of existing residential redevelopment areas where residential development may be likely, and areas where a large area of the wastewater collection system flows into one main/trunk. As shown in Figure 5.14-4, each scenario consists of 5,000 additional units in one IBC area (Scenarios 1, 2, and 3). Details for each scenario can be found in the IBC SAMP.

Scenario 1

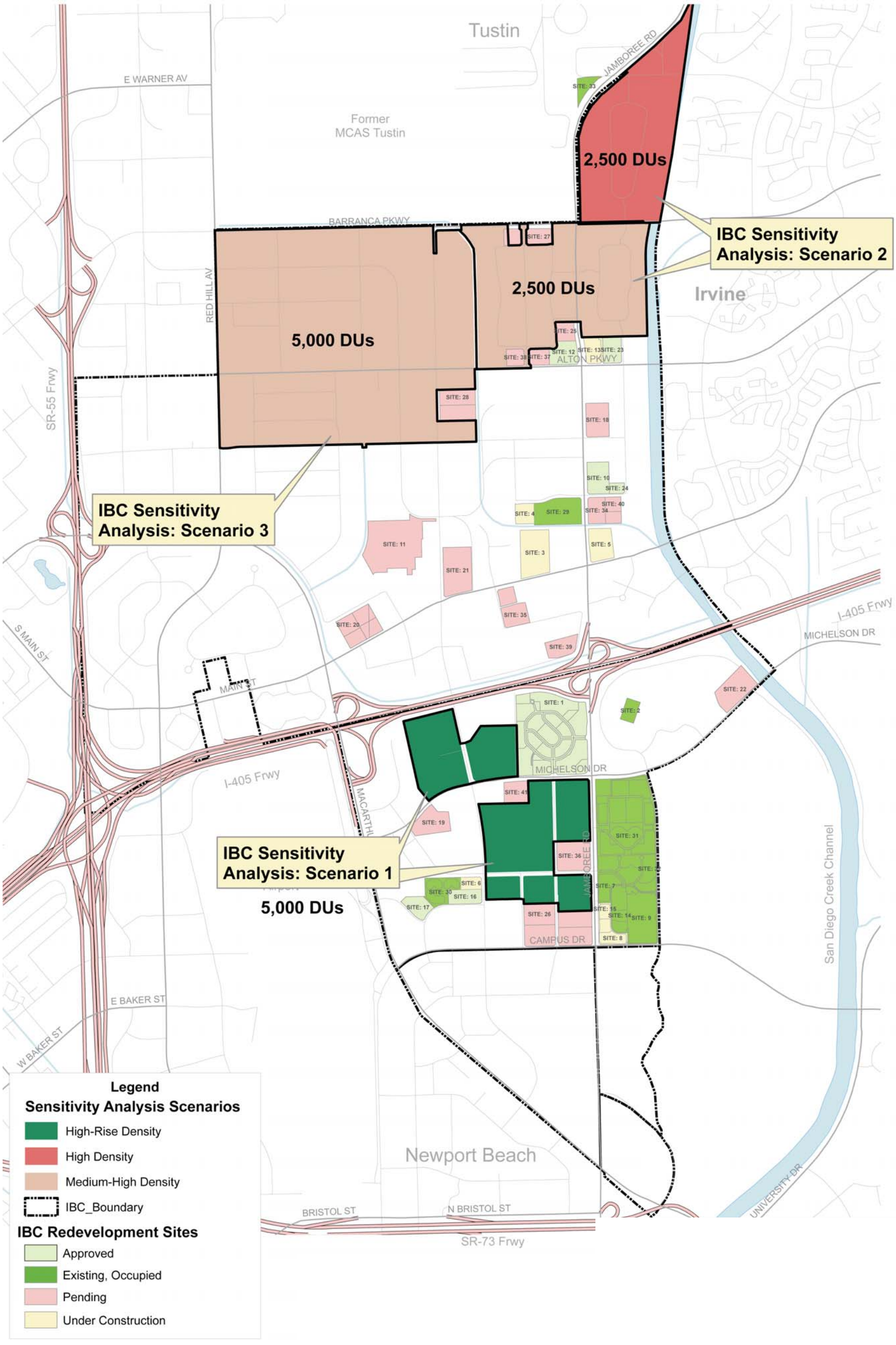
This scenario assumes 5,000 units south of the 405 freeway. Deficiencies for Sensitivity Analysis Scenario 1 are summarized in Table 5.14-16. For Scenario 1, six improvements were identified and are presented in Table 5.14-17. Improvements WW4 through WW6 and WW18 are recommended for the main in Dupont Drive. This main was deficient under future conditions, but not significantly enough to warrant improvements for existing redevelopments only. If this area is developed with full residential buildout, this main will not have the capacity to handle the additional wastewater flow. For this sensitivity analysis scenario, two segments of 8-inch and two segments of 10-inch pipe were significantly over the capacity criteria and have the potential for surcharging during peak-hour conditions. Improvements WW14 and WW15 are recommended for the main in Teller Avenue. These two segments of 8-inch pipe were surcharged under peak-hour conditions and require upsizing if full residential buildout occurs in this area. All remaining deficiencies identified for this scenario were less than 20 percent above the capacity criteria and improvements were not deemed necessary.

Table 5.14-16
Scenario 1 Wastewater System Deficiencies during Maximum-Day Flow

Deficiency No.	Pipe Diameter	Pipe Length	Pipe Location	Deficiency
WW1*	10-inch	39 feet	Obsidian north of Michelson Dr.	d/D > Capacity (0.63) (0.50)
WW2*	10-inch	225 feet		d/D > Capacity (0.59) (0.50)
WW3*	10-inch	32 feet		d/D > Capacity (0.53) (0.50)
WW4*	10-inch	335 feet	Dupont Dr. between Von Karman Ave. and Teller Ave.	d/D ≥ Capacity (0.50) (0.50)
WW5*	8-inch	310 feet	Dupont Dr. between Bardeen Ave. and Teller Ave.	d/D > Capacity (0.57) (0.50)
WW6*	8-inch	310 feet		d/D > Capacity (0.51) (0.50)
WW7*	8-inch	250 feet	Martin between Douglas and Campus Dr.	d/D > Capacity (0.53) (0.50)
WW8*	10-inch	434 feet	Von Karman Ave. between Main St. and McGaw Ave.	d/D > Capacity (0.54) (0.50)
WW9*	12-inch	2,069 feet	MacArthur Blvd. between Birch St. and Newport Pl.	d/D > Capacity (1.00) (0.50)
WW10*	12-inch	1,193 feet	MacArthur Blvd. between Dove St. and Newport Pl.	d/D > Capacity (0.67) (0.50)
WW11*	12-inch	729 feet	MacArthur Blvd. between Dove St. and Jamboree Rd.	d/D > Capacity (0.69) (0.50)
WW12*	12-inch	112 feet	Across Jamboree Rd. to MacArthur Blvd.	d/D > Capacity (0.73) (0.50)
WW13	8-inch	320 feet	Teller Ave. between Dupont Dr. and Michelson Dr.	d/D > Capacity (0.55) (0.50)
WW14	8-inch	320 feet	Teller Ave. between Dupont Dr. and Michelson Dr.	d/D > Capacity (1.00) (0.50)
WW15	8-inch	320 feet	Teller Ave. between Dupont Dr. and Campus Dr.	d/D > Capacity (1.00) (0.50)
WW16	8-inch	335 feet	Teller Ave. between Dupont Dr. and Campus Dr.	d/D > Capacity (0.51) (0.50)
WW17	8-inch	335 feet	Teller Ave. between Dupont Dr. and Campus Dr.	d/D > Capacity (0.57) (0.50)
WW18	10-inch	328 feet	Dupont Dr. between Bardeen Ave. and Teller Ave.	d/D > Capacity (0.67) (0.50)
WW19	8-inch	320 feet	Teller Ave. between Dupont Dr. and Michelson Dr	d/D > Capacity (0.53) (0.50)

Source: IBC SAMP 2008
* indicates deficiency identified for future (redeveloped) conditions, which is not due to flows added for sensitivity analysis scenarios.

Wastewater Collection System Sensitivity Analysis Scenarios



Source: IBC SAMP 2008

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Table 5.14-17
Scenario 1 Recommended Improvements

Improvement No.	Existing Pipe Diameter	Pipe Length	Proposed New Pipe Diameter
WW4	10-inch	338 feet	15-inch
WW5	8-inch	304 feet	12-inch
WW6	8-inch	317 feet	10-inch
WW11	10-inch	328 feet	12-inch
WW14	8-inch	320 feet	12-inch
WW15	8-inch	318 feet	12-inch
WW18	10-inch	328 feet	12-inch

Source: IBC SAMP 2008.

All the deficiencies are due to the assumption of high-rise redevelopment in Scenario 1 south of Michelson Drive. The impact is only potential because the SAMP assumes that 19,552 dwelling units will be built in the IBC, with 5,000 south of the 405 freeway. The maximum number of units for the proposed project is 16,191. In addition, the need for wastewater infrastructure upgrades could be avoided by reducing the density of residential units in Scenario 1 from a highrise density of 40 du/ac to a maximum highrise density of about 17.5 du/ac for the area south of Michelson Drive.

Through the use of its WRMP and SAMP, the IRWD will determine each project's fair share costs and connection fees associated with servicing their project site. There are 13 water connection districts and 13 sewer connection districts within the IRWD. Through the use of these established fees, which are regularly updated, the IRWD is able to ensure that project proponents pay their fair share of costs associated with increased demand for service generated by new development projects. Improvements listed in Table 5.14-7 will occur as the IBC builds out and will be funded through existing sewer connection fees, as well as project specific improvements as determined by IRWD. IRWD estimates that wastewater collection system improvements will cost approximately $3,020,355. Developer contribution to that sum could be $103,680 for improvement WW6 because it is not a regional transmission line, if determined by IRWD when connection is sought and site design is submitted to IRWD for review. These cost estimates are for improvements discussed in both the future condition and sensitivity analysis. The flow of wastewater from the IBC, in combination with existing wastewater flows, would not exceed existing and planned wastewater treatment capacity in the region. The project would not exceed wastewater treatment requirements as set by the Santa Ana Regional Water Quality Control Board.

Scenario 2

Located on the northeast corner of IBC, this scenario assumes 2,500 high density and 2,500 medium-high density residential units. Table 5.14-18 summarizes the wastewater system deficiencies.

Two improvements were identified for Sensitivity Analysis Scenario 2 and are presented in Table 5.14-19. Improvements WW30 and WW31 are recommended for the trunk in the Jamboree Road. This trunk conveys all wastewater flow out of the area defined for Sensitivity Analysis Scenario 2 and was surcharged under peak hour conditions. This pipe should be upsized in order to handle additional wastewater flow for full residential buildout of this area. There were also a number of deficiencies in Construction Circle East Street and Construction Circle West Street. Improvements are not recommended for these deficiencies since all pipes except one were not surcharged and were less than 40 percent above capacity criteria for peak-hour conditions. The 8-inch pipe in Construction Circle West Street that appeared to be surcharged , identified as WW25, is likely due to the resolution of the hydraulic model and improvement was not considered warranted for this deficiency.

Table 5.14-18
Scenario 2 Wastewater System Deficiencies during Maximum-Day Flow

Deficiency No.	Pipe Diameter	Pipe Length	Pipe Location	Deficiency
WW1*	10-inch	39 feet	Obsidian north of Michelson Dr.	d/D > Capacity (0.63) (0.50)
WW2*	10-inch	225 feet		d/D > Capacity (0.59) (0.50)
WW3*	10-inch	32 feet		d/D > Capacity (0.53) (0.50)
WW4*	10-inch	335 feet	Dupont Dr. between Von Karman Ave. and Teller Ave.	d/D ≥ Capacity (0.50) (0.50)
WW5*	8-inch	310 feet	Dupont Dr. between Bardeen Ave. and Teller Ave.	d/D > Capacity (0.57) (0.50)
WW6*	8-inch	310 feet		d/D > Capacity (0.51) (0.50)
WW7*	8-inch	250 feet	Martin between Douglas and Campus Dr.	d/D > Capacity (0.53) (0.50)
WW8*	10-inch	434 feet	Von Karman Ave. between Main St. and McGaw Ave.	d/D > Capacity (0.54) (0.50)
WW9*	12-inch	2,069 feet	MacArthur Blvd. between Birch St. and Newport Pl.	d/D > Capacity (1.00) (0.50)
WW10*	12-inch	1,193 feet	MacArthur Blvd. between Dove St. and Newport Pl.	d/D > Capacity (0.67) (0.50)
WW11*	12-inch	729 feet	MacArthur Blvd. between Dove St. and Jamboree Rd.	d/D > Capacity (0.69) (0.50)
WW12*	12-inch	112 feet	Across Jamboree Rd. to MacArthur Blvd.	d/D > Capacity (0.73) (0.50)
WW20	10-inch	320 feet	Teller Ave. between Dupont Dr. and Michelson Dr.	d/D > Capacity (0.55) (0.50)
WW21	10-inch	250 feet	Construction Circle W. between Warner Ave. and Barranca Pkwy	d/D > Capacity (0.63) (0.50)
WW22	12-inch	362 feet	Construction Circle E. between Warner Ave. and Barranca Pkwy	d/D > Capacity (0.60) (0.50)
WW23	12-inch	381feet	Construction Circle E. between Warner Ave. and Barranca Pkwy	d/D > Capacity (0.60) (0.50)
WW24	12-inch	381 feet	Construction Circle E. between Warner Ave. and Barranca Pkwy	d/D > Capacity (0.60) (0.50)
WW25	12-inch	381 feet	Construction Circle E. between Warner Ave. and Barranca Pkwy	d/D > Capacity (0.56) (0.50)
WW26	12-inch	199 feet	Construction Circle E. between Warner Ave. and Barranca Pkwy	d/D > Capacity (0.52) (0.50)
WW27	10-inch	457 feet	Noyes Ave. and Richter Ave.	d/D > Capacity (0.53) (0.50)
WW28	12-inch	460 feet	Richter Ave. Between Noyes Ave. and Jamboree Rd.	d/D > Capacity (0.51) (0.50)
WW29	8-inch	340 feet	Alton Pkwy between Murphy Ave. and Jamboree Rd.	d/D > Capacity (0.60) (0.50)

Table 5.14-18
Scenario 2 Wastewater System Deficiencies during Maximum-Day Flow

Deficiency No.	Pipe Diameter	Pipe Length	Pipe Location	Deficiency
WW30	18-inch	652 feet	Jamboree Rd. Between Alton Pkwy and McGaw Ave.	d/D > Capacity (1.00) (0.75)
WW31	18-inch	658 feet	Jamboree Rd. Between Alton Pkwy and McGaw Ave	d/D > Capacity (1.00) (0.75)
WW32	8-inch	113 feet	Construction Circle W. between Warner Ave. and Barranca Pkwy	d/D > Capacity (0.68) (0.50)
WW33	8-inch	398 feet	Construction Circle W. between Warner Ave. and Barranca Pkwy	d/D > Capacity (0.67) (0.50)
WW34	8-inch	371 feet	Construction Circle W. between Warner Ave. and Barranca Pkwy	d/D > Capacity (0.67) (0.50)
WW35	8-inch	371 feet	Construction Circle W. between Warner Ave. and Barranca Pkwy	d/D > Capacity (1.00) (0.50)

Source: IBC SAMP 2008
* indicates deficiency identified for future (redeveloped) conditions, which is not due to flows added for sensitivity analysis scenarios.

Table 5.14-19
Scenario 2 Recommended Improvements

Improvement No.	Existing Pipe Diameter	Pipe Length	Proposed New Pipe Diameter
WW30	18-inch	652 feet	21-inch
WW31	18-inch	658 feet	21-inch

Source: IBC SAMP 2008

Scenario 2 consists of redevelopment of the northeast corner of the IBC to 2,500 du of high density and 2,500 du of medium-high density residential units. To avoid the wastewater infrastructure upgrades, the northeast corner of IBC should have a maximum redevelopment density of about 15 du/ac instead of high-rise density and medium-high density of 32.5 du/ac and 17.5 du/ac, respectively. The impact is only potential because the SAMP assumes that 19,552 dwelling units will be built in the IBC. The maximum number of units for the proposed project is 16,191. As discussed in Scenario 1, there are 13 water connection districts and 13 sewer connection districts within the IRWD. Through the use of these established fees, which are regularly updated, the IRWD is able to ensure that the wastewater system is maintained.

Scenario 3

This scenario includes 5,000 medium-high density units in north central IBC. Deficiencies for Sensitivity Analysis Scenario 3 were all the result of future condition flows and unrelated to the additional residential dwelling units for the sensitivity analysis, therefore, there are no recommended improvements for this scenario.

5.14.2.4 Cumulative Impacts

As the agency charged with providing water and sewer systems within the City of Irvine, the IRWD regularly updates the WRMP and creates SAMPs in an effort to conserve water resources, ascertain changed

conditions, and accurately plan for land use changes associated with the City's evolving Zoning Code and General Plan. Implementation of the proposed project may require expanded water facilities, including upsizing of some wastewater and nonpotable water pipe segments. However, the project would not result in a significant impact related to the construction of expanded water facilities. While development in the IBC will increase sewer demand and impact capacity and flow, IRWD has sufficient planned sewer capacity to accommodate the increase in demand. Through its SAMP, IRWD has identified areas in need of improvement and has determined the cost of wastewater improvements. IRWD will fund approximately 97 percent of the wastewater system, with developer contributions totaling a little over $100,000 for site specific, nonregional transmission line improvements, if necessary. Through the SAMP process, it has been demonstrated that the sewer collection and treatment system would meet project demand for wastewater service. Additionally, the long-range planning efforts of IRWD take into account current and proposed projects to eliminate the potential for cumulative impacts. Therefore, the proposed project's demand for potable, nonpotable, and wastewater collection and treatment services would not be cumulatively considerable.

5.14.2.5 Level of Significance Before Mitigation

Impact 5.14-2

PPP 14-2 would help reduce and avoid potential impacts related to wastewater services. Project-generated wastewater could be adequately treated by the wastewater service provider for the project.

5.14.2.6 Mitigation Measures

No mitigation measures are required.

5.14.2.7 Level of Significance After Mitigation

No significant impacts have been identified.

5.14.3 Solid Waste

5.14.3.1 Environmental Setting

Orange County Integrated Waste Management Department is the government agency that regulates and operates the local Orange County landfills, including the Frank R. Bowerman Landfill. Waste Management of Orange County is the private contract hauler for all residential developments in the City of Irvine. Frank R. Bowerman Landfill is a 725-acre site in the City of Irvine with 341 acres of permitted area of disposal and a maximum daily is 8,500 tons per day. The Orange County Board of Supervisors certified the Final EIR for the expansion of the landfill on August 15, 2006, and as a result, the closure date of this facility is 2053. IWMD is currently pursuing all required permits for the landfill expansion. The county is currently meeting goals of Assembly Bill 939, which requires that each county and city prepare a source reduction and recycling element showing how it will meet solid waste diversion goals of 25 percent by the year 1995 and 50 percent by the year 2000 and every year after.

5.14.3.2 Thresholds of Significance

According to Appendix G of the CEQA Guidelines, a project would normally have a significant effect on the environment if the project:

U-6 Would be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs.

U-7 Would not comply with federal, state, and local statutes and regulations related to solid waste.

5.14.3.3 Environmental Impacts

Existing Plans, Programs, and Policies

The following measures are existing plans, programs, or policies that apply to the proposed project and will help to reduce and avoid potential impacts related to solid waste services:

PPP 14-4 This project will result in new construction that will generate solid waste. Prior to the issuance of precise grading permits, the applicant shall show on the site plans the location of receptacle(s) to accumulate on-site-generated solid waste for recycling purposes. At the discretion of the Director of Community Development the developer of a nonresidential project may be permitted to contract with a waste recycler for off-site materials recovery. In this case the applicant must provide a letter verifying that recycling will be conducted off site in an acceptable manner (City of Irvine Standard Condition A.12).

Project Design Features

There are no specific Project Design Features that relate to potential impacts on solid services and facilities.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement.

IMPACT 5.14-3: EXISTING FACILITIES WOULD BE ABLE TO ACCOMMODATE PROJECT-GENERATED SOLID WASTE AND COMPLY WITH RELATED SOLID WASTE REGULATIONS. [THRESHOLDS U-6 AND U-7]

Impact Analysis: The proposed increase in residential uses is expected to generate the typical range of recyclable and nonrecyclable waste that other such uses create, including green waste (i.e., lawn and tree trimmings), cardboard, paper, glass, plastic, aluminum cans, diapers, food, and household hazardous waste (paint, motor oil, antifreeze, batteries), etc. Solid waste disposal services for the IBC shall be provided by Waste Management of Orange County, a private contract hauler for all residential developments in the City of Irvine.

Development of the proposed project would increase the service demand for solid waste disposal beyond existing conditions and would provide more solid waste to the Bowerman Landfill in Irvine. On average, residential land uses generate approximately 12.23 pounds of solid waste per household per day and commercial uses generate an average of 0.046 pound of solid waste per square foot per day, as shown on Table 5.14-20.

Table 5.14-20
Solid Waste Generation Rates for New Developments

Land Use	Generation Factor
Residential	12.23 lbs/household/day
Industrial Park (offices) and General Industrial	1 lb/100 sf/day
Commercial/Retail	0.046 lbs/sf/day
Hotels	0.046 lbs/sf/day
School/University	1 lb/student/day
Institutional, Cultural and Museum	3.12 lbs/100 sf/day

Source: CIWMB 2004.

The additional 7,583 residential units planned for the IBC, would generate approximately 92,740 pounds per day (ppd) or 46.37 tons per day (tpd). The additional 372 hotel rooms would generate approximately 12,098 ppd or 6.05 tpd. The remaining nonresidential buildout potential would be 6,016,662 square feet, which would generate an additional 74,207 ppd or 33.66 tpd (390,000 square feet of retail and 5,626,662 square feet of office and industrial). The project would generate a total of 86.08 tpd. The rate of disposal for the landfill serving the project area is 8,500 tpd. The Orange County Integrated Waste Management District can accommodate the project specifically and cumulatively (Arnau 2008).

5.14.3.4 Cumulative Impacts

The proposed project, in combination with other projects in the county, would increase demand for landfills and solid waste services for the County of Orange. Total waste generation from the IBC at buildout is estimated to be approximately 856,869 ppd or 428 tpd (1,731,000 square feet retail, 47,056,662 square feet office/industrial, 3,478 hotel rooms, and 17,038 residential units). However, the Orange County Landfill system is required to have available disposal capacity for a projected period of 15 years. The Orange County Landfill System has demonstrated this capacity and regularly imports solid waste from Los Angeles County. The Orange County Integrated Waste Management District can accommodate the project specifically and cumulatively (Arnau 2008). Therefore, the project-related demand would not be cumulatively considerable.

5.14.3.5 Level of Significance Before Mitigation

Impact 5.14-3

PPP 14-4 would ensure that prior to the issuance of precise grading permits, the applicant shall show on the site plans the location of receptacle(s) to accumulate on-site generated solid waste for recycling purposes or at the discretion of the Director of Community Development the developer of a nonresidential project may be permitted to contract with a waste recycler for off-site materials recovery. Therefore, impacts on solid waste would be less than significant.

5.14.3.6 Mitigation Measures

No mitigation measures are required.

5.14.3.7 Level of Significance After Mitigation

No significant impacts have been identified.

5.14.4 Utility Demands

5.14.4.1 Environmental Setting

Electrical Service

The IBC is within the service territory of Southern California Edison (SCE). SCE provides electrical service to 430 cities and communities covering approximately 50,000 square miles of service area and encompassing 11 counties in central and coastal southern California. The IBC currently has electricity service, used by residential, office, and light industrial uses. Energy use from existing structures is based on energy generation rates available from the Database for Energy Efficient Resources (DEER). Energy use from each land use within the IBC is shown in Table 5.14-21.

Table 5.14-21
Existing Electricity Demand in the IBC

Land Use	*Units*	*Electricity Generation Factor*[1]	*Total Demand in kilowatts per hour per year (kwh/year)*	*Total Demand in gigawatts per hour per year (gwh/year)*[2]
Existing				
Residential	5,011 du	4,333 kWh/DU	21,712,663	21.71
Commercial	1,341,000 square feet	11.329 kWh/SF	15,192,189	15.19
Commercial- Hotel	1,713,000 square feet	10.869 kWh/SF	18,618,597	18.62
Industrial	14,701,000 square feet	6.995 kWh/SF	102,833,495	102.83
Office	26,381,000 square feet	13.604 kWh/SF	358,887,124	358.89
			Existing Electricity Demand	**517.24**

[1] Source: DEER
[2] gwh = 1,000,000 kwh

Natural Gas Service

The IBC lies entirely in the utility service territory of the Southern California Gas Company. The company's service territory encompasses approximately 23,000 square miles in most of central and Southern California. The IBC currently has natural gas service, used by existing residential, office, and light industrial uses. The existing gas demand in the IBC is shown in Table 5.14-22.

Table 5.14-22
Existing Gas Demand in the IBC

Land Use	*Units*	*Electricity Generation Factor*[1]	*Total Demand in Therms per year*
Residential	5,011 du	285 Therm/DU	1,428,135
Commercial	1,341,000 square feet	0.0388 Therm/SF	52,031
Commercial- Hotel	1,713,000 square feet	0.1054 Therm/SF	180,550
Industrial	14,701,000 square feet	0.388 Therm/SF	5,703,988
Office	26,381,000 square feet	0.0029 Therm/SF	76,505
		Existing Gas Demand	**7,441,209**

[1] Source: DEER Database

Cable

Cox Cable currently provides cable TV, internet, and phone service to both commercial and residential customers in the IBC.

Telephone, Internet, Wireless Services

Cox Communications is the major provider of advanced cable, video, voice, and database services for homes and business in the City of Irvine. AT&T, provides telephone, wireless communications, pagers and paging services, internet service, and satellite television service to the Irvine area. Verizon provides telephone, wireless communications, and internet service to the Irvine area.

5.14.4.2 Environmental Impacts

Existing Plans, Programs, and Policies

The following measures are existing plans, programs, or policies that apply to the proposed project and will help to reduce and avoid potential impacts related to water services:

PPP 14-5 The proposed project shall comply with all State Energy Insulation Standards and City of Irvine codes in effect at the time of application for building permits. (Commonly referred to as Title 24, these standards are updated periodically to allow consideration and possible incorporation of new energy efficiency technologies and methods. Title 24 covers the use of energy efficient building standards, including ventilation, insulation and construction and the use of energy saving appliances, conditioning systems, water heating, and lighting.) Plans submitted for building permits shall include written notes demonstrating compliance with energy standards and shall be reviewed and approved by the Public Utilities Department prior to issuance of building permits.

Project Design Features

There are no specific Project Design Features that relate to potential impacts on utility services.

The following impact analysis addresses thresholds of significance for which the Initial Study disclosed potentially significant impacts. The applicable thresholds are identified in brackets after the impact statement

IMPACT 5.14-4: EXISTING AND/OR PROPOSED FACILITIES WOULD BE ABLE TO ACCOMMODATE PROJECT-GENERATED UTILITY DEMANDS. [NO SPECIFIC THRESHOLD]

Impact Analysis: Private utility companies are regulated by the California Public Utilities Commission. The following describes other private utilities in the IBC that would have an increased demand for services as a result of buildout the project.

Electricity

The existing 5,011residential units, 2,137,000 square feet of hotel, and 42,771,000 square feet of nonresidential land uses in the IBC currently generate approximately 517.24 gigawatts per hour per year (Gwh/year) of electricity. The primary demand for electricity, gas, and communications within the project area will be from the additional 7,583 residential units, 6,016,662 square feet of nonresidential square development, and approximately 263,000 square feet of hotel. The total demand for electricity for the buildout at the IBC is shown in Table 5.14-23. Energy use from existing and future structures is based on energy generation rates available from the Database for Energy Efficient Resources (DEER).

Table 5.14-23
Total Projected Electricity Demand in the IBC

Land Use	Units	Electricity Generation Factor[1]	Total Demand in kilowatts per hour per year (kwh/year)	Total Demand in gigawatts per hour per year (Gwh/year)[2]
Residential	17,038 du	4,333 kWh/DU	4,855,830	73.83
Commercial	1,731,000 square feet	11.329 kWh/SF	67,163	19.61
Commercial- Hotel	2,137,000 square feet	10.869 kWh/SF	23,227,053	23.23
Industrial	13,180,000 square feet	6.995 kWh/SF	5,113,840	92.19
Office	33,712,662 square feet	13.604 kWh/SF	97,767	458.63
			Total Buildout Demand[3]	**667.48**
			Existing Electricity Demand	517.24
			Increase from Existing	**150.24**

du = defined as dwelling unit
[1] Source: DEER
[2] 1 gw = 1,000,000 kw
[3] Includes cumulative projects that are approved, under construction, pending units, potential units, and density bonus units.

At buildout the IBC would generate a demand for 667.48 Gwh/year of electricity, which would increase the overall demand by 150.24 Gwh/year. Demand for energy and natural gas service would be accommodate by the service providers. New facilities to support the demand for electric service in the IBC would be constructed by SCE in accordance with the demand for new service. In addition, new structures within the IBC would be built in accordance with the recently adopted 2008 Building and Energy Efficiency Standards. The 2008 Building and Energy Efficiency Standards are approximately 15 percent more energy efficient than the previous 2005 Building and Energy Efficiency Standards. Consequently, SCE would be able to supply electricity to meet the demand for electricity the IBC.

Natural Gas

According to the Southern California Gas Company, gas service can be provided from existing gas mains in various locations. The service will be in accordance with the Company's policies and extension rules on file with the California Public Utilities Commission when the contractual agreements are made. The total buildout demand for gas in the IBC is shown in Table 5.14-24.

Table 5.14-24
Total Projected Demand for Gas in the IBC

Land Use	Units	Gas Generation Factor[1]	Total Demand in Therms per year
Residential	17,038 du	285 Therm/DU	4,855,830
Commercial	1,731,000 square feet	0.0388 Therm/DU	67,163
Commercial- Hotel	2,137,000 square feet	0.1054 Therm/DU	225,240
Industrial	13,180,000 square feet	0.388 Therm/DU	5,113,840
Office	33,712,662 square feet	0.0029 Therm/DU	97,767
		Total Buildout Demand[2]	**10,359,839**
		Existing Gas Demand	7,441,209
		Increase from Existing	**2,918,630**

du = defined as dwelling unit
[1] Source: DEER
[2] Includes cumulative projects that are approved, under construction, pending units, potential units, and density bonus units.

At buildout the IBC would generate a demand for 10,359,839 therms per year, which would increase the overall demand by 2,918,630 therms per year.

Cable

Additional residential units would increase the demand for television and cable services. Additional facilities would be necessary to accommodate the additional residential units, such as new cabling, node locations, and power supplies. To provide service future residential development, enhancement and/or extensions of existing facilities near project sites would be required. Construction of the necessary improvements and/or extensions creates the potential for additional impacts such as dust, noise, and air emissions. The potential impacts associated with the construction of communication facilities are accounted for in other sections of this EIR (Sections 5.1 through 5.15). Any applicable mitigation measures identified in those sections will address potential significant impacts associated with construction of public utilities (in particular see Sections 5.3Air Quality, 5.9 Noise, and 5.13 Traffic). Therefore, through consistent implementation of a variety of mitigation measures related to construction impacts as presented in Table 1.5 in Section 1, *Executive Summary*, no additional impacts related to construction and operation of the facilities would occur. Therefore, no substantial physical impacts are anticipated.

Telephone, Internet, Wireless Services

The proposed project would increase the demand on the telephone service system; however, there is already telephone service in the project area and telephone facilities can be upgraded without any significant impact on the environment.

All communication services will be extended from their existing sources.

5.14.4.3 Cumulative Impacts

According to the California Energy Commission (CEC) energy use in the state is growth at 1.25 percent per year and peak demand is growing at 1.35 percent per year (CEC 2009). Air conditioning use is the primary contributor to the growth in peak electricity demand. To meet the growing energy demands of the state, the CEC is implementing metering infrastructure to support stronger demand-response policies. Around 2010, the majority of consumers in the state will have meters that can measure electricity use, and in some cases natural gas use, every 15 minutes or at least every hour. In addition, many utility companies offer incentives for recycling older inefficient air conditioners. In addition, the CEC is working to develop dynamic pricing tariffs to reduce demand for electricity at peak periods (CEC 2009). According to SCE, the electrical loads of the project are within parameters of projected load growth which SCE is planning to meet in this area.

Cumulative development in the project area as projected from buildout of the project would increase natural gas consumption. Based on present conditions of gas supply and regulatory policies, there are no significant impacts to gas services anticipated at this time; therefore the project-related demand for natural gas would not be cumulatively considerable.

Cox, AT&T, and Verizon would be able to accommodate the needs for telephone, internet, wireless, and cable service for this project and other projects in the area. No adverse impacts on the ability to service the area would result.

5.14.4.4 Level of Significance Before Mitigation

Impact 5.14-4

Buildout of the project in the IBC would have an increased demand for services; however, existing and/or proposed facilities would be able to accommodate project-generated utility demands. PPP 14-5 ensures that the proposed project shall comply with all State Energy Insulation Standards and City of Irvine codes in effect at the time of application for building permits.

5.14.4.5 Mitigation Measures

No mitigation measures are required.

5.14.4.6 Level of Significance After Mitigation

No significant impacts have been identified.

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