



# AGENDA ITEM

## Public Utilities Commission

City and County of San Francisco



DEPARTMENT Water Enterprise AGENDA NO. 8a  
MEETING DATE July 9, 2013

**Approve Water Supply Assessment:** Consent Calendar  
**Project Manager:** Paula Kehoe

**Approve Water Supply Assessment for the Event Center and Mixed-Use Development Project at Piers 30-32 and Seawall Lot 330**

<b>Summary of Proposed Commission Action:</b>	<b>Approve</b> the Water Supply Assessment (WSA) for the proposed Event Center and Mixed-Use Development Project at Piers 30-32 and Seawall Lot 330, pursuant to the State of California Water Code Section 10910 <i>et seq.</i> and California Environmental Quality Act (CEQA) Section 21151.9 and CEQA Guidelines Section 15155.
<b>Background:</b>	<p>Water Code Sections 10910-10915 provide a nexus between the regional land use planning process and the environmental review process. The law also reflects the growing awareness of the need to incorporate water supply and demand analysis at the earliest possible stage in the land use planning process. The core of this law is the requirement for a public water system to prepare a water supply assessment (WSA) of whether available water supplies are sufficient to serve the demand generated by projects of a specified size (“water demand projects”), as well as the reasonably foreseeable cumulative demand in the region over the next 20 years under a range of hydrologic conditions. The WSA is required within 90 days of the time the public water system receives a request for such assessment from the lead agency preparing an environmental impact report (EIR) or negative declaration under CEQA. The Planning Department, which carries out the City’s lead agency responsibilities under CEQA is preparing an EIR for the proposed project and has identified the proposed project as a water demand project.</p> <p>The content of a WSA is specified by the Water Code and includes identification of any existing water supply entitlements or contracts, and detailed information about groundwater supplies. It assesses the adequacy of water supplies to serve the proposed project and cumulative demand.</p> <p>The WSA must be completed by the public water supplier that would</p>

**APPROVAL:** \_\_\_\_\_

COMMISSION  
SECRETARY

Donna Hood

**Agreement:** Approve Water Supply Assessment for the Event Center and Mixed-Use Development Project at Piers 30-32 and Seawall Lot 330

**Commission Meeting Date:** July 9, 2013

	<p>serve the project and be approved by its governing body at a public meeting. Approval of a WSA is not approval of the development project for which the WSA is prepared. A WSA is an informational document required to be prepared for use in the City's environmental review of a project under CEQA.</p> <p>The attached WSA prepared by SFPUC staff analyzes the sufficiency of long-term water supplies to serve the proposed project and cumulative development and concludes that there are adequate short-term and long-term water supplies to provide water service to the Project in compliance with the State Water Code requirements.</p>
<b>Result of Inaction:</b>	<p>A delay in approving this agenda item will result in the inability of the San Francisco Planning Department to complete the environmental review for the proposed Event Center and Mixed-Use Development Project at Piers 30-32 and Seawall Lot 330. Under CEQA Guidelines Section 15155, the SFPUC may, within 90 days of the request for the WSA from Planning, request a reasonable extension of time to complete the WSA.</p>
<b>Description of Action:</b>	<p>Approve the WSA for the proposed Event Center and Mixed-Use Development Project at Piers 30-32 and Seawall Lot 330, pursuant to the State of California Water Code 10910.</p>
<b>Environmental Review:</b>	<p>Approval of the WSA is not a project under CEQA as the WSA is an informational document prepared for the CEQA process and is not an approval of the Project.</p>
<b>Recommendation:</b>	<p>SFPUC staff recommends that the Commission adopt the attached resolution.</p>
<b>Attachments:</b>	<ol style="list-style-type: none"><li>1. SFPUC Resolution</li><li>2. Water Supply Assessment for the Event Center and Mixed-Use Development Project at Piers 30-32 and Seawall Lot 330</li></ol>

# **PUBLIC UTILITIES COMMISSION**

City and County of San Francisco

RESOLUTION NO. \_\_\_\_\_

WHEREAS, under the California Environmental Quality Act (CEQA) and State Water Code (Section 10910(g)(1)), the SFPUC is required to prepare and approve a Water Supply Assessment (WSA) for the Event Center and Mixed-Use Development Project at Piers 30-32 and Seawall Lot 330 cumulative water demands; and

WHEREAS, a WSA is an informational document that assesses the adequacy of water supplies to serve a project and is required to be prepared as part of the CEQA environmental review process; and

WHEREAS, as an informational document, approval of the WSA is not a project under CEQA and is not an approval of the Event Center and Mixed-Use Development Project at Piers 30-32 and Seawall Lot 330; and

WHEREAS, a WSA must be approved at a public meeting by the governing body of the public water supplier that would serve the project; and

WHEREAS; the SFPUC staff prepared a WSA for the Event Center and Mixed-Use Development Project at Piers 30-32 and Seawall Lot 330, which concluded that the SFPUC has adequate water supplies to meet the Project's water demands through 2035; now, therefore, be it

RESOLVED, this Commission approves the Water Supply Assessment for the Event Center and Mixed-Use Development Project at Piers 30-32 and Seawall Lot 330 on file with the Commission Secretary, pursuant to the State of California Water Code 10910(g).

*I hereby certify that the foregoing resolution was adopted by the Public Utilities Commission at its meeting of July 9, 2013.*


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*Secretary, Public Utilities Commission*



July 1, 2013

TO: Commissioner Art Torres, President  
Commissioner Vince Courtney, Vice President  
Commissioner Ann Moller Caen  
Commissioner Francesca Vietor  
Commissioner Anson B. Moran

THROUGH: Harlan L. Kelly, Jr., General Manager 

FROM: Steven R. Ritchie, Assistant General Manager, Water

RE: Water Supply Assessment for the Event Center and Mixed-Use  
Development Project at Piers 30-32 and Seawall Lot 330

## 1.0 Summary

### 1.1 Introduction

Under the Water Supply Assessment law (Sections 10910 through 10915 of the California Water Code), urban water suppliers like the San Francisco Public Utilities Commission (SFPUC) must furnish a Water Supply Assessment (WSA) to the city or county that has jurisdiction to approve the environmental documentation for certain qualifying projects (as defined in Water Code Section 10912 (a)) subject to the California Environmental Quality Act (CEQA). The WSA process typically relies on information contained in a water supplier's Urban Water Management Plan (UWMP), and involves answering specific questions related to the estimated water demand of the proposed project. This memo serves as the WSA for the proposed Event Center and Mixed-Use Development Project at Piers 30-32 and Seawall Lot 330, herein referred to as the "proposed project", for use in the preparation of an environmental impact report by the City and County of San Francisco Planning Department (case no. 2012.0718, San Francisco Planning Department).

#### 1.1.1 The SFPUC's 2010 UWMP and 2013 Water Availability Study

The SFPUC's current UWMP was adopted in 2010. The UWMP incorporated 2009 Land Use Allocation (LUA 2009) projections from the San Francisco Planning Department. In 2012, the San Francisco Planning Department updated its LUA projections (LUA 2012), increasing the estimated number of new dwelling units and jobs over the previous LUA 2009 projections. As a result of the LUA 2012 projections, the SFPUC concluded that its 2010 UWMP no longer accounts for every project requiring a WSA (qualifying project) within San Francisco. Therefore, any qualifying project will require preparation of a WSA that documents the SFPUC's current and projected water supplies when compared to projected demands associated with the LUA 2012 projections. The LUA 2012 projections are provided in Section 3.1 of the 2013 Water Availability Study, discussed below.

The SFPUC will not be preparing an updated UWMP until 2015. During this interim period, the SFPUC developed a 2013 Water Availability Study to document the SFPUC's current and projected retail water supplies when compared to projected retail water demands associated with the LUA 2012 projections. The information in the Study is not project-specific and must be provided in the WSA of any qualifying project within San Francisco. ***The 2013 Water Availability Study is incorporated herein as Attachment A and referenced throughout this WSA with bold, italicized text.***

Edwin M. Lee  
Mayor

Art Torres  
President

Vince Courtney  
Vice President

Ann Moller Caen  
Commissioner

Francesca Vietor  
Commissioner

Anson Moran  
Commissioner

Harlan L. Kelly, Jr.  
General Manager





### **1.1.2 Basis for Requiring a WSA for the Proposed Project**

The proposed project has not been the subject of a previous WSA, nor has it been part of a larger project for which a WSA was completed. The proposed project qualifies for preparation of a WSA under Water Code Section 10912(a)(2) because it is a mixed-use development that includes a business establishment having more than 500,000 square feet of floor space. The proposed project also qualifies for preparation of a WSA because it would use more water than required by a 500 dwelling unit project (Water Code section 10912(a)(7)). The SFPUC previously determined that a 500 dwelling unit project would create retail water demand of 50,000 gallons per day (gpd) or 18.25 million gallons per year (gpy). The proposed project is characterized further in Section 1.2.

### **1.1.3 Conclusion of this WSA**

In this WSA, the SFPUC concludes that there are adequate water supplies to serve the proposed project and cumulative retail water demands during normal years, single dry years, and multiple dry years over a 20-year planning horizon from 2015 through 2035. Additional information on supply sufficiency is provided in Section 4.2, Findings.

## **1.2 *Proposed Project Description***

Golden State Warriors, LLC proposes to construct a multi-purpose event center and a mixed-use development at two sites that are adjacent to The Embarcadero, just south of the Bay Bridge. The proposed event center would be located on Piers 30-32 at the southeast corner of The Embarcadero and Bryant Street. The proposed mixed-use development would be located on Seawall Lot 330 at the southwest corner of The Embarcadero and Bryant Street, directly across from Piers 30-32. Construction is anticipated to begin in 2015 and be completed in 2017. The developments proposed at each site are described below.

### **1.2.1 Piers 30-32**

The Piers 30-32 site is approximately 13-acres and is currently vacant except for a small restaurant building and surface parking. Golden State Warriors, LLC proposes to construct a multi-purpose event center, public open space, a parking facility, fire house, maritime uses, and visitor-serving retail uses. The various components of Pier 30-32 are described below. For additional detail, including number of events and anticipated employment and attendance, see the Proposed Project Demand Memo in Attachment C.

#### **Event Center**

The proposed event center would have a seating capacity of 18,000 seats and occupy approximately 728,000 square feet. The event center would serve as the new home of the Golden State Warriors. The event center would host all Warriors home games, as well as provide a year round venue for a variety of other uses including concerts, family shows, conferences, conventions and other sporting events.

The event center main floor would include a full length NBA basketball court for Warriors basketball games, which can also accommodate a stage for performances. Other supporting event center facilities would include player/performer locker rooms, club and press areas, concessions, restrooms, a commissary, and a large marshaling area. The Warriors practice facility and support offices would also be integrated within the event center.

The practice facility would include two full length NBA basketball courts with approximately 21,000 square feet of playing surface, a weight room and medical treatment facilities, locker rooms, and a players' lounge. A multi-purpose room of approximately 2,000 square feet would be used as a community amenity, including events such as community meetings. The support offices would accommodate

Warriors management, coaching and operations staff, administration, finance, marketing, broadcasting, merchandising, public relations, and ticket operations.

#### Open Space Uses

The Piers 30-32 improvements would be designed to integrate public access and open space and to provide public view corridors of San Francisco Bay. At least 50 percent of the area of Piers 30-32 is proposed to be open space. Large areas of the plazas totaling over 65,000 square feet would be landscaped.

#### Other Uses

The Piers 30-32 improvements would include approximately 25,000 square feet of retail and 80,000 square feet of restaurant space. The retail and restaurant uses would mainly be in proposed buildings along The Embarcadero. Some retail uses may also be incorporated into the event center as well. A parking garage consisting of approximately 500 spaces would serve the proposed uses and would be completely enclosed within the development.

### **1.2.2 Seawall Lot 330**

Seawall Lot 330 is approximately 2.3 acres and is currently used as a surface parking lot. Golden State Warriors, LLC proposes to construct a mixed-use development, including residential, hotel, and retail uses.

The proposed Seawall Lot 330 development would include a 4-story building (ground level plus three podium levels), above which one 13-story residential tower and a 7-story hotel tower would be developed. The towers would contain 176 residential and 227 hotel units. The ground level and second floor of the podium facing the Embarcadero would accommodate retail and restaurant uses.

Seawall Lot 330 would include approximately 259 parking spaces within an above-grade garage that would be completely enclosed by the proposed residential, hotel, and retail uses. The garage would provide off-street parking and loading for residential and hotel uses within the development.

Seawall Lot 330 would include landscape areas at ground level and green roof areas above the podium, totaling 15,000 square feet. The landscape and green roof area would be integrated into a proposed stormwater management system. The development would include a swimming pool and two hot tubs, one for residential use and the other for hotel use.

For additional detail on the Seawall Lot 330 portion of the proposed project, including square footages and anticipated employment, see the Water Demand Memorandum in Attachment C.

## **2.0 Water Supply**

This section reviews San Francisco's existing and planned water supplies.

### **2.1 Regional Water System**

See **Section 1.2 of the Water Availability Study** (Attachment A) for descriptions of the Regional Water System (RWS), water rights held by City and County of San Francisco, the SFPUC Water Supply Improvement Program (WSIP), and the relationship between SFPUC's retail and wholesale customers.

### **2.2 Existing Retail Supplies**

Retail water supplies from the RWS are described in **Section 2.1.1 of the Water Availability Study**.

Local groundwater supplies, including the Westside Groundwater Basin, Central Groundwater Sub Basin, and Sunol Infiltration Gallery, are described in **Section 2.1.2 of the Water Availability Study**.

Local recycled water supplies, including the Harding Park Recycled Water Project and Pacifica Recycled Water Project, are described in **Section 2.1.3 of the Water Availability Study**.

### **2.3 Planned Retail Water Supply Sources**

The San Francisco Groundwater Supply Project is described in **Section 2.2.1 of the Water Availability Study**.

The proposed Westside and Eastside Recycled Water Projects are described in **Section 2.2.2 of the Water Availability Study**.

### **2.4 Summary of Current and Future Retail Water Supplies**

A breakdown of water supply sources for meeting SFPUC retail water demand through 2035 in normal years is provided in **Section 2.3 of the Water Availability Study**.

### **2.5 Dry-Year Water Supplies**

A description of dry-year supplies developed under WSIP, future options that SFPUC is exploring, and a breakdown of water supply sources for meeting SFPUC retail water demand through 2035 in multiple dry years are provided in **Section 2.4 of the Water Availability Study**. For a single dry year, the retail RWS allocation and, thus, the breakdown of water supply sources would be the same as those in a normal year.

## **3.0 Water Demand**

This section reviews the climatic and demographic factors that may affect San Francisco's water use, projected retail water demands, and the demand associated with the proposed project.

### **3.1 Climate**

San Francisco has a Mediterranean climate. Summers are cool and winters are mild with infrequent rainfall. Temperatures in the San Francisco area average 57 degrees Fahrenheit annually, ranging from the mid-40s in winter to the upper 60s in late summer. Strong onshore flow of wind in summer keeps the air cool, generating fog through September. The warmest temperatures generally occur in September and October. Rainfall in the San Francisco area averages about 22 inches per year and is generally confined to the "wet" season from late October to early May. Except for occasional light drizzles from thick marine stratus clouds, summers are nearly completely dry. A summary of the temperature and rainfall data for the City of San Francisco is included in Table 1.



**Table 1: San Francisco Climate Summary**

Month	Average Maximum Temperature (°F)	Average Minimum Temperature (°F)	Average Monthly Rainfall (inches)
January	58.0	45.7	4.36
February	60.3	47.3	4.41
March	61.4	48.1	2.98
April	62.3	49.1	1.38
May	63.2	50.9	0.68
June	64.8	52.7	0.18
July	65.6	54.3	0.02
August	66.6	55.3	0.06
September	68.1	55.0	0.19
October	67.8	53.3	1.04
November	61.2	48.1	2.85
December	58.3	45.9	4.33
<b>Annual Average</b>	<b>63.3</b>	<b>50.6</b>	<b>22.45</b>
Source: Western Regional Climate Center ( <a href="http://www.wrcc.dri.edu">www.wrcc.dri.edu</a> ), 1981-2010 data from two San Francisco monitoring stations (Mission Dolores/SF#047772 and Richmond/SF#047767).			

### **3.2 Projected Growth**

For a comparison of the 2009 and 2012 LUA projections for housing and employment through 2035, **see Section 3.1 of the Water Availability Study**.

### **3.3 Projected Retail Water Demands**

In-City retail water demands are estimated using the City's Retail Water Use Models, which were updated with the latest housing and employment projections from LUA 2012. **See Section 3.2 of the Water Availability Study** for tabulated retail water demand projections through 2035 and a description of the model methodology.

### **3.4 Proposed Project Water Demand**

Golden State Warriors, LLC's water resource consultants provided a memo describing the methods and assumptions used to estimate the water demand of the proposed project, along with the resulting demand (Attachment C). The SFPUC reviewed the memo to ensure that the methodology is appropriate for the types of proposed water uses, the assumptions are valid and thoroughly documented along with verifiable data sources, and a professional standard of care was used. The SFPUC concluded that the demand estimates provided by Golden State Warriors, LLC's consultants are reasonable. Water demand associated with the proposed project over the 20-year planning horizon is shown in the following table.



**Table 2: Water Demand Based on Project Phasing**

	2015 <sup>1</sup>	2020	2025	2030	2035
Total Demand of Proposed Project (mgd)	0	0.109	0.109	0.109	0.109
mgd = million gallons per day					
<b>Note:</b>					
1. Construction of the proposed project is anticipated to begin in 2015 with completion in 2017.					

The San Francisco Planning Department has determined that the proposed project is encompassed within the projections presented in LUA 2012 as indicated in the letter from the Planning Department to the SFPUC (Attachment B). Therefore, the demand of the proposed project is also encompassed within the San Francisco retail water demands that are presented in **Section 3.2 of the Water Availability Study**, which considers retail water demand based on the LUA 2012 projections. The following table shows the demand of the proposed project relative to total retail demand.

**Table 3: Proposed Project Demand Relative to Total Retail Demand**

	2015	2020	2025	2030	2035
Total Retail Demand (mgd) <sup>1</sup>	83.7	83.4	82.4	82.5	84.2
Proposed Project Demand (mgd)	0	0.109	0.109	0.109	0.109
Portion of Total Retail Demand <sup>2</sup>	0%	0.13%	0.13%	0.13%	0.13%
mgd = million gallons per day					
<b>Notes:</b>					
1. Retail water demands per <b>Table 6 of the Water Availability Study</b> .					
2. The proposed project is accounted for in the LUA 2012 projections and subsequent retail water demand projections.					

## 4.0 Conclusion

### 4.1 Comparison of Projected Supply and Demand

**Section 4.0 of the Water Availability Study** compares the SFPUC's retail water supplies and demands through 2035 during normal year, single dry-, and multiple dry-year periods. See Table 4, below, which is repeated from the Water Availability Study (Table 7, Attachment A). As explained previously in Section 3.4, water demands associated with the proposed project are already captured in the retail demand projections presented in the Water Availability Study. The proposed project is expected to represent 0.13 percent of the total In-City retail water demand.



**Table 4: Projected Supply and Demand Comparison (mgd)**

		Normal Year <sup>1,2</sup>	Single Dry Year <sup>1,2</sup>	Multiple Dry Years		
				Year 1 <sup>1,2</sup>	Year 2 <sup>2,3</sup>	Year 3 <sup>2,3</sup>
2015	Total Retail Demand	83.7	83.7	83.7	83.7	83.7
	Total Retail Supply – Existing Supplies Only <sup>4</sup>	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit)	(0.2)	(0.2)	(0.2)	(1.7)	(1.7)
	Total Retail Supply – Existing & Future Supplies <sup>4</sup>	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit) <sup>5</sup>	(0.2)	(0.2)	(0.2)	(1.7)	(1.7)
2020	Total Retail Demand	83.4	83.4	83.4	83.4	83.4
	Total Retail Supply – Existing Supplies Only <sup>4</sup>	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit)	0.1	0.1	0.1	(1.4)	(1.4)
	Total Retail Supply – Existing & Future Supplies <sup>4</sup>	88.3	88.3	88.3	86.8	86.8
	Surplus/(Deficit)	4.9	4.9	4.9	3.4	3.4
2025	Total Retail Demand	82.4	82.4	82.4	82.4	82.4
	Total Retail Supply – Existing Supplies Only <sup>4</sup>	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit)	1.1	1.1	1.1	(0.4)	(0.4)
	Total Retail Supply – Existing & Future Supplies <sup>4</sup>	90.3	90.3	90.3	88.8	88.8
	Surplus/(Deficit)	7.9	7.9	7.9	6.4	6.4
2030	Total Retail Demand	82.5	82.5	82.5	82.5	82.5
	Total Retail Supply – Existing Supplies Only <sup>4</sup>	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit)	1.0	1.0	1.0	(0.5)	(0.5)
	Total Retail Supply – Existing & Future Supplies <sup>4</sup>	90.3	90.3	90.3	88.8	88.8
	Surplus/(Deficit)	7.8	7.8	7.8	6.3	6.3
2035	Total Retail Demand	84.2	84.2	84.2	84.2	84.2
	Total Retail Supply – Existing Supplies Only <sup>4</sup>	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit) <sup>6</sup>	(0.7)	(0.7)	(0.7)	(2.2)	(2.2)
	Total Retail Supply – Existing & Future Supplies <sup>4</sup>	90.3	90.3	90.3	88.8	88.8
	Surplus/(Deficit)	6.1	6.1	6.1	4.6	4.6

**Notes:**  
 1. Normal-year retail water supplies per *Table 3 of the Water Availability Study*.  
 2. Retail water demands per *Table 6 of the Water Availability Study*.  
 3. Year 2 and 3 of multiple dry years per *Table 4 of the Water Availability Study*.  
 4. Existing and future supply sources per *Table 3 (repeated in Table 4) of the Water Availability Study*.  
 5. The deficit shown for 2015 in a normal year with existing and future supplies represents less than a 0.25% shortfall and during a multiple dry-year drought event represents a 2.0% shortfall, which can be easily managed through voluntary conservation measures or rationing. Current retail demand in FY11/12 was 77.8 mgd. If retail demand exceeds the available water supply of 83.5 mgd, the Water Supply Agreement allows the SFPUC to import additional water from the RWS, with mitigation implemented by the SFPUC and potential environmental surcharges if RWS deliveries exceed the 265 mgd interim supply limitation. (Total RWS deliveries in FY11/12 were 219.4 mgd.)  
 6. The deficit shown for 2035 is projected if none of the local groundwater and recycled water projects are implemented as described in *Section 2.2 of the Water Availability Study*.

As concluded in **Section 4.1 of the Water Availability Study**, the LUA 2012 projections result in a retail demand in 2035 of 84.2 mgd, which represents a 3.3 mgd, or 4%, increase over the 2035 demand projections estimated in the 2010 UWMP. The ability to meet the demand of the retail customers is in large part due to development of 10 mgd of local WSIP supplies, including conservation, groundwater, and recycled water. These supplies are anticipated to be fully implemented over the next 10 years.

If planned future water supply projects (i.e., San Francisco Groundwater Supply Project, Westside Recycled Water Project, and Eastside Recycled Water Project) are not implemented, normal-year supplies may not be enough to meet projected retail demands. To balance any water supply deficits during normal years, the SFPUC may import additional water from the RWS, with mitigation implemented by the SFPUC and potential environmental surcharges if RWS deliveries exceed the 265 mgd interim supply limitation.

If dry-year supply projects (i.e., Calaveras Dam Replacement Project, Lower Crystal Springs Dam Improvements Project, Upper Alameda Creek Filter Gallery Project, GSR Project, and water transfers) are not implemented, existing dry year supplies may not be enough to meet projected retail demands. To balance any water supply deficits during dry years, the SFPUC may reduce system deliveries and impose customer rationing.

The SFPUC remains committed to meeting the level of service goals and objectives outlined under WSIP. In addition, the SFPUC is currently exploring other future supplies, including:

- Development of additional conservation and recycling.
- Development of additional groundwater supplies.
- Securing of additional water transfer volumes.
- Increasing Tuolumne River supply.
- Revising the Upper Alameda Creek Filter Gallery Project capacity.
- Development of a desalination project.

#### **4.2 Findings**

Regarding the availability of water supplies to serve the proposed project beginning in 2017, the SFPUC finds, based on the entire record before it, as follows:

- During normal years, single dry years, and multiple dry years, the SFPUC has sufficient water supplies to serve the proposed project.
- With the addition of planned retail supplies, the SFPUC has sufficient water supplies available to serve its retail customers, including the demands of the proposed project, existing customers, and foreseeable future development.

Approval of this WSA by the Commission is not equivalent to approval of the development project for which the WSA is prepared. A WSA is an informational document required to be prepared for use in the City's environmental review of a project under CEQA. It assesses the adequacy of water supplies to serve the proposed project and cumulative demand.

If there are any questions or concerns, please contact Steve Ritchie at (415) 934-5736 or [SRitchie@sfgwater.org](mailto:SRitchie@sfgwater.org).

## **Attachment A –**

### **2013 Water Availability Study**



# 2013 Water Availability Study

for the City and County of San Francisco

Prepared by:

The San Francisco Public Utilities Commission

May 2013



San Francisco  
**Water Power Sewer**

Services of the San Francisco Public Utilities Commission

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## 1.0 Introduction and Background

### 1.1 Purpose of this Study

Water Code Sections 10910-10915 require urban water suppliers to evaluate water supply availability to inform environmental review for qualifying projects ("water demand projects") defined in Water Code Section 10912(a). Water Code Section 10910 requires the preparation of a "water supply assessment" (WSA) for water demand projects that include a determination of whether available water supplies are sufficient to serve the demand generated by the project, as well as reasonably foreseeable cumulative demand over a 20 year period, including years of normal precipitation, single dry, and multiple dry years. If the water supplies needed by a water demand project were accounted for in the water supplier's most recent 5 year Urban Water Management Plan (UWMP), under Water Code Section 10910(c)(2), the water supplier may incorporate the requested information from the UWMP in preparing a WSA for a water demand project.

The SFPUC's most recent UWMP adopted in 2010 relied on the San Francisco Planning Department's (SF Planning) 2009 Land Use Allocation (LUA) projections of housing and employment growth in San Francisco to estimate future retail water demands. In summer 2012, SF Planning updated the 2009 LUA to incorporate the Association of Bay Area Government's (ABAG) Sustainable Community Strategy Jobs-Housing Connections Scenario as detailed in a memorandum from SF Planning to the SFPUC dated January 28, 2013 (Appendix A). SF Planning's 2012 LUA projects an additional 11,235 new dwelling units and 35,068 new jobs in San Francisco by 2035 over the previous 2009 LUA projections considered in the SFPUC's 2010 Urban Water Management Plan (UWMP).<sup>1</sup>

As a result of 2012 LUA projections, the SFPUC concluded that its 2010 UWMP no longer accounted for all projected retail water demands. The SFPUC will not be preparing an updated UWMP until 2015. Therefore, during this interim period, the SFPUC has developed this Water Availability Study (Study) to document the SFPUC's current and projected retail water supplies when compared to projected retail water demands associated with these projects and anticipated new growth in San Francisco under the 2012 LUA projections. This Study incorporates and utilizes the information in the 2010 UWMP, but includes the following:

- Updated retail demand projections based on the 2012 LUA housing and employment projections, and updates to the SF Retail Demand Model as detailed in a memorandum from the SFPUC dated February 22, 2013 (Appendix B).
- Updated project description and schedule for the San Francisco Groundwater Supply Project based on the SFPUC San Francisco Groundwater Supply Project Draft Environmental Impact Report (EIR) (March 2013).
- Updated schedule for the Eastside Recycled Water Project based on SFPUC planning efforts to date.
- Updated schedules for dry-year water supply projects.

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<sup>1</sup> The projected increase in demand results largely from the incorporation of Senate Bill (SB) 375 in retail demand projections. SB 375 requires ABAG and the Metropolitan Transportation Commission to develop a Bay Area Sustainable Communities Strategy that 1) achieves a greenhouse gas emissions reduction target set by the California Air Resources Board by reducing vehicle travel through colocation of housing and mass transit, and 2) identifies a strategy to meet the Bay Area's entire housing need by income level within the Bay Area.

The information and conclusions of this Study, in concert with the background information provided in the 2010 UWMP that is incorporated into this Study, can be used in the development of water supply assessments for pending water demand projects.

## **1.2 Background**

This section provides a broad overview of the Regional Water System (RWS); the SFPUC water rights; the Water System Improvement Program (WSIP); the relationship of the SFPUC's retail water customers to wholesale customers; and historic trends in retail and wholesale water demands.

### **1.2.1 The SFPUC Regional Water System<sup>2</sup>**

The SFPUC, a department of the City and County of San Francisco, owns and operates the RWS. The RWS supplies water to both SFPUC wholesale customers and retail customers, the latter primarily in San Francisco. Historically, the RWS has supplied approximately 96% of the SFPUC's retail water demands. The remaining portion of the SFPUC's retail water supply comes from local groundwater and secondary treated recycled water. Groundwater in San Francisco is used primarily for irrigation at local parks and on highway medians. Recycled water is used mostly at municipal facilities for wastewater treatment process water, sewer box flushing, and similar wash down operations. These local supplies are discussed in greater detail in Section 2.1.

In 1934, San Francisco combined the Hetch Hetchy system and Spring Valley system to create the SFPUC RWS. The rights to store and divert water at Pilarcitos, San Andreas, Crystal Springs, and Calaveras Reservoirs were originally held by the Spring Valley Water Company, which was formed in 1862. San Francisco purchased Spring Valley in 1930.

The RWS currently delivers an annual average of approximately 219 million gallons per day (mgd) to 2.6 million users in Tuolumne, Alameda, Santa Clara, San Mateo, and San Francisco counties. The RWS is a complex system, shown in Figure 1, and supplies water from two primary sources:

- Tuolumne River through the Hetch Hetchy Reservoir, and
- Local runoff into Bay Area reservoirs in the Alameda and Peninsula watersheds.

Water from Hetch Hetchy Reservoir provides the majority of the water supply available to the SFPUC. On average, the Hetch Hetchy Project provides over 85% of the water delivered to the SFPUC's service area. The amount of water available to the SFPUC from the RWS is constrained by hydrology, physical facilities, and institutional parameters such as the 1913 Raker Act (38 Stat. 242) that allocate the water supply of the Tuolumne River between San Francisco and the Modesto and Turlock Irrigation Districts downstream. Due to these constraints, the SFPUC is very dependent on reservoir storage to maximize the reliability of its water supplies. During dry years, the SFPUC has a very small share of Tuolumne River runoff available and the local Bay Area watersheds produce very little water. Reservoir storage is critical during drought cycles because it enables the SFPUC to carry over water supply from wet years to dry years. During droughts the water received from the Hetch Hetchy system can amount to over 93% of the total water delivered. As explained in Section 1.2.3, the SFPUC is implementing a Water System Improvement Program ("WSIP") to assure the long-term adequacy of its water system. The SFPUC developed WSIP water supply objectives based on RWS supplies forecasted for a conservative "design drought" of 8.5 years.<sup>3</sup>

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<sup>2</sup> For more detailed information on the RWS, see Section 2.1 of the SFPUC's 2010 UWMP.

<sup>3</sup> For more detailed information on use of the design drought, see Section 5.1.2 of the 2010 UWMP.



Bay Area reservoirs provide on average approximately 15% of the water delivered by the SFPUC RWS. The local watershed facilities are operated to conserve local runoff for delivery. On the San Francisco Peninsula, the SFPUC utilizes Crystal Springs Reservoir, San Andreas Reservoir, and Pilarcitos Reservoir to capture local watershed runoff. In the Alameda Creek watershed, the SFPUC constructed the Calaveras Reservoir and San Antonio Reservoir. In addition to capturing runoff, San Antonio, Crystal Springs, and San Andreas reservoirs also provide storage for Hetch Hetchy diversions. The local watershed facilities also serve as an emergency water supply in the event of an interruption to Hetch Hetchy diversions.



Figure 1: SFPUC Regional Water System

### 1.2.2 Water Rights

San Francisco owns "pre-1914" appropriative water rights to store and deliver water from Hetch Hetchy, Cherry and Eleanor Reservoirs in the Tuolumne River watershed and locally from the Alameda and Peninsula watersheds. The SFPUC also diverts and stores water in San Antonio Reservoir under an appropriative water right license granted by the State Water Resources Control Board (SWRCB) in 1976.

Appropriative water rights allow the holder to divert water from a source to a place of use not connected to the water source. These rights are based on seniority and use of water must be reasonable, beneficial, and not wasteful. In 1914, California established a formal water rights permit system, which is administered by the SWRCB. The SWRCB has sole authority to issue and administer post-1914 appropriative water rights, but has limited jurisdiction over pre-1914 appropriative water rights.

The 1912 Freeman Report identified the ultimate diversion rate from the Tuolumne River to the Bay Area as 400 mgd, and the City used this as the basis for designing the export capacity of the Hetch Hetchy project. The City has sufficient water rights for current diversions and the ultimate planned export of 400 mgd to the Bay Area.

In the 1913 Raker Act, the United States granted rights-of-way to the San Francisco over public land for purposes of constructing the Hetch Hetchy project. The Act recognizes the senior water rights of the Turlock and Modesto Irrigation Districts (TID and MID) to divert water from the Tuolumne River, and the City must bypass certain flows through its Tuolumne River reservoirs to TID and MID. By agreement, the City, TID, and MID have supplemented these Raker Act obligations to increase the TID and MID

entitlements to account for other senior Tuolumne River water rights and allow the City to "pre-pay" TID and MID their entitlement by storing water in the Don Pedro water bank. The City is required to bypass inflow to TID and MID totaling 2,416 cubic feet per second (cfs) or natural daily flow, whichever is less, at all times (as measured at La Grange), except for April 15 to June 13, when the requirement is 4,066 cfs or natural daily flow as measured at La Grange, whichever is less.

### **1.2.3 The Water System Improvement Program**

To enhance the ability of the SFPUC water system to meet the service goals for water quality, seismic reliability, delivery reliability, and water supply, the SFPUC is undertaking the WSIP. The WSIP is a \$4.6 billion, multi-year, capital program to upgrade the RWS. The program will deliver improvements that enhance the SFPUC's ability to provide reliable, affordable, high-quality drinking water to its wholesale customers and retail customers in an environmentally sustainable manner.<sup>4</sup>

As required under the California Environmental Quality Act (CEQA), SF Planning prepared a Program Environmental Impact Report (PEIR) for the WSIP. The PEIR analyzed the water supply effects of the WSIP at a project-level of detail and analyzed the WSIP facility improvement projects at a program-level of detail. The PEIR was certified by the San Francisco Planning Commission on October 30, 2008. On the same day, the SFPUC adopted the Phased WSIP Variant option in Resolution No. 08-200. The phased WSIP includes the following program elements:

- Full implementation of all WSIP facility improvement projects;
- Water supply delivery to RWS customers through 2018;
- Water supply sources (265 mgd average annual from SFPUC watersheds; 10 mgd of conservation, recycled water, and groundwater in San Francisco; and 10 mgd of conservation, recycled water, and groundwater from the wholesale service area);
- Dry-year water transfers coupled with the Westside Groundwater Basin Conjunctive Use project to ensure drought reliability;
- Reevaluation of 2030 demand projections, RWS wholesale water purchase requests, and water supply options by 2018 and a separate SFPUC decision by 2018 regarding water deliveries after 2018; and
- Provision of financial incentives to limit water sales to an average annual 265 mgd "interim supply limitation" from the SFPUC watersheds through 2018.

The WSIP facility improvement projects approved by the SFPUC in 2008 included the implementation of groundwater, recycled water, and conservation projects in San Francisco. Since then, the SFPUC has been completing project-level review of projects requiring further environmental review, and proceeding to implement these projects. The WSIP identified that recycled water and groundwater projects would provide a total of approximately 6 mgd of additional water supply for retail customers, and another 4 mgd would be derived from active and passive conservation measures. The water supply goal in Resolution No. 08-200 was established to meet customer water needs in non-drought and drought periods. The water supply goal would be achieved under the following WSIP system performance objectives:

- Meet average annual water demand of 265 mgd (the interim supply limitation) from the SFPUC watersheds for retail and wholesale customers during non-drought years for system demands through 2018.

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<sup>4</sup> For more information on the WSIP, see Sections 3.1.1 and 3.1.2 of the 2010 UWMP.



- Meet dry-year delivery needs through 2018 while limiting rationing to a maximum 20% system-wide reduction in water service during extended droughts.<sup>5</sup>
- Diversify water supply options during non-drought and drought periods.
- Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

Although the Phased WSIP Variant is designed to keep deliveries from exceeding an annual average target level of about 265 mgd, the SFPUC may deliver more than this interim supply limitation if necessary. In the event the SFPUC must deliver more than 265 mgd to its customers from its watersheds, the SFPUC must implement the WSIP PEIR mitigation measures associated with these impacts in proportion to the extent of the exceedance. In implementing the Phased WSIP Variant, the need could arise to temporarily increase deliveries from the watersheds over the 265 mgd interim supply limitation to meet customer water delivery needs in the near term, because of public health and safety considerations and because it might not be possible to implement all proposed local conservation, recycling, and groundwater projects and actions in time to meet unanticipated increases in customer demands. The mitigation measures identified in the PEIR to address potential impacts that could arise from RWS deliveries in excess of the interim supply limitation are:<sup>6</sup>

- Avoidance of flow changes in the lower Tuolumne River below La Grange dam by reducing demand for water from Don Pedro Reservoir (i.e., via a water transfer agreement with MID/TID and/or other water agencies such that the acquired water is developed through actions that result in reduction of demand on Don Pedro Reservoir and subsequently no change in the release pattern from La Grange dam)
- Fishery habitat enhancement
- Lower Tuolumne River Riparian Habitat Enhancement

As an incentive to keep RWS deliveries below the 265 mgd interim supply limitation, the SFPUC and its wholesale customers agreed to pay "environmental enhancement surcharges" for deliveries in excess of 265 mgd, as described in the next section.

#### **1.2.4 Allocation of Water Between SFPUC Retail and Wholesale Customers<sup>7</sup>**

The SFPUC provides water to both retail and wholesale customers. While this Study concerns water availability for retail customers, it is important to understand the contractual relationship between retail and wholesale customers to properly characterize the amount of water available to retail customers in normal and drought years. Approximately 2.6 million people within San Francisco, San Mateo, Santa Clara, Alameda, and Tuolumne Counties rely entirely or in part on the water supplied from the RWS by the SFPUC. Approximately one-third of RWS supplies are served directly to retail customers, primarily in San Francisco, and about two-thirds to wholesale customers outside San Francisco by contractual agreement. There are limited numbers of retail customers outside San Francisco.

The wholesale customers, except the cities of San Jose and Santa Clara, are collectively entitled to 184 mgd – the so called "Supply Assurance" – from the RWS under the terms of a 1984 contract and

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<sup>5</sup> This 20% rationing level applies to retail and wholesale customers combined. No rationing level is specified for retail customers only.

<sup>6</sup> For a full description of these mitigation measures, see Section 6.4.2 of the WSIP PEIR, Measures 5.3.6-4a, 5.3.6-4b, and 5.3.7.-6.

<sup>7</sup> For more detailed information on the allocation of water, see Section 4.3.1 of the 2010 UWMP.

settlement agreement. The Supply Assurance represents a dedication of water supply by the City of San Francisco to the wholesale customer group. San Jose and Santa Clara are temporary, interruptible customers that are not included within the 184 mgd Supply Assurance. But for purposes of defining the interim supply limitation of 265 mgd, the total 184 mgd wholesale share of the interim supply limitation, while equal to the Supply Assurance, also includes a total of 9 mgd (4.5 mgd each) for San Jose and Santa Clara, who retain their temporary, interruptible status. One of the decisions deferred by the SFPUC in the adoption of the Phased WSIP Variant was whether or not to increase the Supply Assurance above 184 mgd. The 2009 wholesale Water Supply Agreement requires the SFPUC to make this decision by December 31, 2018, along with deciding whether or not to make San Jose and Santa Clara permanent customers.<sup>8</sup>

The SFPUC memorialized many of the WSIP commitments in the 2009 Water Supply Agreement with its 26 wholesale customers approved by the SFPUC in Resolution No. 08-0201 following adoption of the WSIP. The Supply Assurance continues to be in effect during the 25-year term of the 2009 Water Supply Agreement. In the wholesale Water Supply Agreement, the SFPUC agreed to:

- Meet average annual demand of 265 mgd (the interim supply limitation) from the SFPUC RWS for retail and wholesale customers during non-drought years for system demands through 2018;
- Achieve levels of service during extended droughts, including by implementing an agreed upon Water Shortage Allocation Plan (WSAP) for the allocation of water between wholesale and retail customers during shortages of up to 20%; and
- Allocate the 265 mgd interim supply limitation as follows: 81 mgd for San Francisco retail customers and 184 mgd for wholesale customers. If deliveries from the RWS exceed 265 mgd, San Francisco retail and wholesale customers would be charged volumetric environmental enhancement surcharges based on their respective amount(s) of excess use, i.e., retail customers would pay the surcharge if retail use exceeds 81 mgd, and individual wholesale customers would pay the surcharge if water deliveries exceed their allotted share (their individual "interim supply allocations") of the total 184 mgd wholesale interim supply limitation.

The wholesale Water Supply Agreement allows the SFPUC to temporarily reduce water deliveries to wholesale customers to a volume that is less than the Supply Assurance in response to emergencies, scheduled maintenance activities, and drought. During droughts, the WSAP outlines procedures for allocating water from the RWS to retail and wholesale customers during system-wide shortages of 20% or less (Tier 1 Plan).<sup>9</sup> Section 3.11.C of the Water Supply Agreement authorizes the wholesale customers to adopt a methodology for allocating the collective wholesale allocation among the individual wholesale customers (Tier 2 Plan). For shortages in excess of 20%, the SFPUC will meet with the wholesale customers to determine if modifications to the Tier 1 Plan can be agreed upon by the SFPUC and the wholesale customers. If they cannot agree, the SFPUC may allocate water in its discretion, subject to challenge by the wholesale customers, unless all of the wholesale customers direct that a particular Tier 2 allocation methodology be used.<sup>10</sup> The WSAP Tier 1 Plan allocates the available water supply between retail and wholesale customers as follows.

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<sup>8</sup> See Section 4.06 of the wholesale Water Supply Agreement.

<sup>9</sup> Refer to the 2010 Urban Water Management Plan Appendix G for full text of the WSAP.

<sup>10</sup> Generally speaking, the differential allocation of water between retail and wholesale customers during droughts by the SFPUC must be reasonable and may include factors such as relative percentage of indoor/outdoor water use, per capita use, and other discretionary criteria.



**Table 1: Retail/Wholesale Water Allocation during System-wide Water Shortage**

Level of System-wide Reduction in Water Use Required	SFPUC Retail Share of Available Water	Wholesale Customer Share (Collectively)
5% or less	35.5%	64.5%
6% to 10%	36.0%	64.0%
11% to 15%	37.0%	63.0%
16% to 20%	37.5%	62.5%

Based on the WSAP allocations presented above in Table 1, Table 2 shows SFPUC RWS retail supply schedules during normal-, single dry-, and multiple dry-year periods. For the purposes of developing these allocations, the SFPUC assumed a delivery goal of 265 mgd. System-wide shortages were applied to a demand of 265 mgd and the subsequent allocations between retail and wholesale collectively.

**Table 2: SFPUC Retail RWS Allocations in Normal, Dry, and Multiple Dry Years**

Normal Year <sup>1</sup>		Single Dry Year <sup>1</sup>		Multiple Dry Years <sup>1,2</sup>					
				Year 1		Year 2		Year 3	
(mgd)	(%)	(mgd)	(%)	(mgd)	(%)	(mgd)	(%)	(mgd)	(%)
81.0	100	81.0	100	81.0	100	79.5	98.1	79.5	98.1
<b>Notes:</b> 1. The allocations presented are valid throughout the 20-year projection. 2. Under the WSAP, the SFPUC retail allocations at a 10% shortage are 85.86 mgd. However, due to the Phased WSIP Variant, only 81 mgd of RWS supply is shown.									

The greater reductions in water supply that are required of wholesale customers, as shown in Table 1, reflect the fact that wholesale customers, to varying degrees, can conserve more water than retail customers in San Francisco due to much greater use of water for landscape irrigation in suburban areas. According to the WSAP allocations, the SFPUC's retail water supplies would decrease by 1.5 mgd, or 1.9%, to 79.5 mgd beginning in Year 2 of multiple dry-year periods. It is well within the ability of retail customers to collectively reduce their demand by this amount through voluntary conservation or rationing. In comparison, during the 1987-1992 drought in San Francisco, the SFPUC experienced system-wide shortages of 25 to nearly 45%. As the drought progressed, SFPUC retail customers were required to reduce total consumption by 14%, up to approximately 32%. A Retail Water Shortage Allocation Plan was adopted by the SFPUC in 2001 to formalize a three-stage program of action to be taken in San Francisco to reduce water use during a drought.<sup>11</sup> The first stage of action targets a reduction of 5-10% via voluntary measures. Table 2 shows water available to retail customers from the RWS over the next 20 years during Years 2 and 3 of multiple dry years, excluding existing and potentially available local water supplies such as groundwater.

The SFPUC remains committed to implementing conservation as an important component of its water supply portfolio. The retail water demands presented in this Study reflect passive and active conservation measures, including a total savings potential of up to 4 mgd by 2018 from active conservation, and 5 mgd by 2035. For more detailed information on the SFPUC's demand management programs, see Section 6 of the 2010 UWMP.

<sup>11</sup> For more detailed information on the Retail Water Shortage Allocation Plan, see Section 5.4.2 of the 2010 UWMP.

## 2.0 Retail Water Supply Analysis

This section reviews San Francisco's existing and projected retail water supplies.

### 2.1 Existing Retail Supplies

#### 2.1.1 Retail Supplies from the Regional Water System

The SFPUC retail customer share of the 265 mgd interim supply limitation from the RWS is 81 mgd. While the RWS is physically capable of delivering more water than the 265 mgd interim supply limitation to wholesale and retail customers, the Phased WSIP Variant adopted by the SFPUC seeks to limit water sales to 265 mgd in order to allow the SFPUC and its wholesale customers to further evaluate locally available supplies prior to reaching a decision to increase diversions from the Tuolumne River within the SFPUC's established water rights. This Study assumes that the normal-year retail share of 81 mgd will continue to be available through the Study horizon of 2035. As described in Section 1.2, the SFPUC can increase deliveries from the RWS over 265 mgd to meet combined retail and wholesale needs during normal years. To do so, the SFPUC would need to implement mitigation measures required in the WSIP PEIR and impose the environmental enhancement surcharges described in Section 1.2.4.

#### 2.1.2 Local Groundwater Supplies

San Francisco overlies all or part of seven un-adjudicated groundwater basins. These groundwater basins include the Westside, Lobos, Marina, Downtown, Islais Valley, South, and Visitation Valley basins. The Lobos, Marina, Downtown and South basins are located wholly within the City limits, while the remaining three extend south into San Mateo County. The portion of the Westside Basin aquifer located within San Francisco is referred to as the North Westside Basin. With the exception of the Westside and Lobos basins, all of the basins are generally inadequate to supply groundwater for municipal supply due to low yield, contamination, or potential subsidence concerns. There is currently no adopted groundwater management plan for the SFPUC's groundwater basins.

Early in its history, San Francisco made use of the local groundwater, springs, and spring-fed surface water, using between 6.0 mgd and 8.5 mgd prior to 1934. After imports of water from the Hetch Hetchy Reservoir began in October 1934, the municipal water supply system began to rely almost exclusively on surface water from the Alameda and Peninsula watersheds and from the Hetch Hetchy Water and Power Project. Local groundwater use, however, has continued in the City.

##### Westside Groundwater Basin – San Francisco<sup>12</sup>

With an area of about 45 square miles, the Westside Groundwater Basin is the largest in San Francisco and is currently used to meet retail water demands for some irrigation customers. The Westside Groundwater Basin is separated from the Lobos Basin to the north by a northwest-trending bedrock ridge through the northeastern part of Golden Gate Park. San Bruno Mountain and San Francisco Bay form the eastern boundary, and the San Andreas Fault and Pacific Ocean form the western boundary. The southern limit of the Westside Groundwater Basin is defined by an area of high bedrock that separates it from the San Mateo Plain Groundwater Basin. The basin opens to the Pacific Ocean on the northwest and San Francisco Bay on the southeast. Portions of the Westside Groundwater Basin, primarily from Lake Merced south, contain three aquifers known as the Shallow Aquifer, Primary Production Aquifer, and Deep Aquifer. The Shallow and Primary Production Aquifers also occur north of Lake Merced

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<sup>12</sup> The primary source of information provided in this section is the SFPUC San Francisco Groundwater Supply Project Draft EIR (March 2013).



depending on the presence or absence of subsurface clay layers. The basin has not been adjudicated nor has it been identified by DWR as overdrafted, or as projected to be overdrafted in the future.

The Westside Groundwater Basin can be subdivided into northern and southern portions by the county line separating San Francisco and San Mateo counties. No geologic features restrict groundwater flow between the northern and southern parts of the groundwater basin. The 14-square-mile portion of the Westside Groundwater Basin north of the San Francisco/San Mateo County line is referred to as the North Westside Groundwater Basin, and the 31-square-mile portion of the Westside Groundwater Basin south of the San Francisco/San Mateo County line is referred to as the South Westside Groundwater Basin. Existing retail groundwater sources are pumped from the North Westside Groundwater Basin.

Since 1926, groundwater has been pumped from wells located in Golden Gate Park and the San Francisco Zoo in the North Westside Groundwater Basin. Based on flow meter data, about 1.5 mgd is produced by these wells.

The SFPUC has implemented a groundwater monitoring program to evaluate groundwater elevations and quality, along with water elevations at Lake Merced. The monitoring system includes a single well or clusters of two or more wells at 19 locations. Groundwater levels in each well are monitored continuously using pressure transducers or are measured quarterly by hand. Based on regular groundwater monitoring conducted in the North Westside Groundwater Basin since 2004, groundwater levels along the Pacific Coast and north of Lake Merced have generally remained above sea level in the Shallow and Primary Production Aquifers.

The SFPUC samples groundwater at five monitoring well locations semiannually to monitor general water quality in the groundwater basin, including four locations near Lake Merced and one at the West Sunset Playground. Three of the locations near Lake Merced include both a Shallow Aquifer and Primary Production Aquifer monitoring well. The monitored parameters include total alkalinity, calcium, magnesium, sodium, potassium, bicarbonate, hardness, chloride, nitrate, sulfate, TDS, pH, and specific conductance. In addition, some wells have been monitored for iron and manganese.

#### Central Groundwater Sub Basin – Livermore/Amador Valley

The SFPUC delivers about 0.4 mgd of groundwater to the Castlewood community in Pleasanton from a well field operated by the SFPUC. These deliveries are historic artifacts of Spring Valley Water Company groundwater exports to San Francisco in the early decades of the 20<sup>th</sup> century. This groundwater is drawn from the Central Groundwater Sub Basin in the Livermore/Amador Valley. DWR has not identified this basin as over-drafted, nor as projected to be over-drafted in the future. These wells are metered and have been in operation for several decades. The system serving Castlewood is not connected to the RWS.

#### Sunol Infiltration Gallery Subsurface Diversion – Sunol

The Sunol Infiltration Gallery (SIG) is located adjacent to Alameda Creek in Sunol, south of the SFPUC's Sunol Pump Station. The SIG is approximately 2,000 feet long and consists of a concrete box structure with 10-foot 8-inch height and a 6-foot width. The bottom of the box structure is open to allow infiltration. The SIG discharges into the Sunol Aqueduct at the Water Temple. About 0.3 mgd of groundwater is delivered to the Sunol Valley Golf Club from the SIG prior to any connection to the RWS.

### **2.1.3 Local Recycled Water Supplies**

From 1932 to 1981, the City's McQueen Treatment Plant, using an activated sludge process, provided recycled water to Golden Gate Park for irrigation and flow augmentation of its streams and lakes. Due to changes in State regulations, the plant could no longer meet standards, and the City closed the McQueen plant and discontinued use of recycled water in Golden Gate Park.

Currently, recycled water use in San Francisco is limited, but the SFPUC is moving forward with expanding the use within the City. Disinfected secondary-treated recycled water from the SFPUC's Southeast Water Pollution Control Plant is used on a limited basis for wash-down operations, and is provided to construction contractors for soil compaction and dust control and other nonessential construction purposes. Current use of recycled water for these purposes does not materially contribute to reducing the retail demands.

The Harding Park Recycled Water Project uses available recycled water from the North San Mateo County Sanitation District (NSMCSD) located in Daly City, to irrigate Harding Park and Fleming Park golf courses in San Francisco. The SFPUC partnered with the NSMCSD for this project which completed construction and began using recycled water in October 2012. Average annual use of recycled water at Harding Park is estimated at 0.23 mgd.

The Pacifica Recycled Water Project will provide recycled water to irrigate the Sharp Park Golf Course in Pacifica (which is owned by the City) and other nearby areas. When completed, the project will save approximately 40 million gallons of drinking water each year. SFPUC has partnered with the North Coast County Water District on this project. Major project construction was completed in spring 2012 and customer retrofits are underway, with recycled water deliveries anticipated to begin in 2013.

## **2.2 Planned Retail Water Supply Sources**

To reliably and sustainably meet the future water needs of its retail customers, the SFPUC has several WSIP facility projects in the planning stages for maintaining normal- and dry-year water supplies for both wholesale and retail customers, and is diversifying its water supply portfolio through the development of local water supplies such as increasing recycled water and groundwater production. These sources of supply were described and analyzed programmatically in the WSIP PEIR and in the 2010 UWMP. Projects related to these efforts are described below.

### **2.2.1 San Francisco Groundwater Supply Project<sup>13</sup>**

The San Francisco Groundwater Supply Project proposes two phases for the construction of up to six wells and associated facilities in the western part of San Francisco to extract up to 4 mgd of groundwater from the North Westside Groundwater Basin for potable use and distribution in the City. Phase 1 would include the construction and operation of four new well facilities to supply an annual average of approximately 2.5 to 3.0 mgd of groundwater. Phase 1 is anticipated to come online and begin water delivery in mid-2016. At initial startup, project well operation would be limited to a maximum combined capacity of 1 mgd as part of an adaptive management program. After one year of monitoring for possible seawater intrusion and adverse effects on Lake Merced, the SFPUC may increase annual pumping by 1 mgd each year, up to a total of 3 mgd during Phase 1 of the project and 4 mgd when Phase 2 is implemented.

Phase 2 would include the conversion of the two existing Golden Gate Park irrigation well facilities currently in use and the operation of the converted irrigation wells to provide an additional annual average of approximately 1.0 to 1.5 mgd of groundwater. Phase 2 of the project would only be implemented after the Westside Recycled Water Project is approved and constructed (anticipated 2018) to provide a new recycled water supply for irrigation uses at Golden Gate Park and nearby golf courses. The extracted groundwater, which would be used both for regular and emergency potable water supply purposes, would

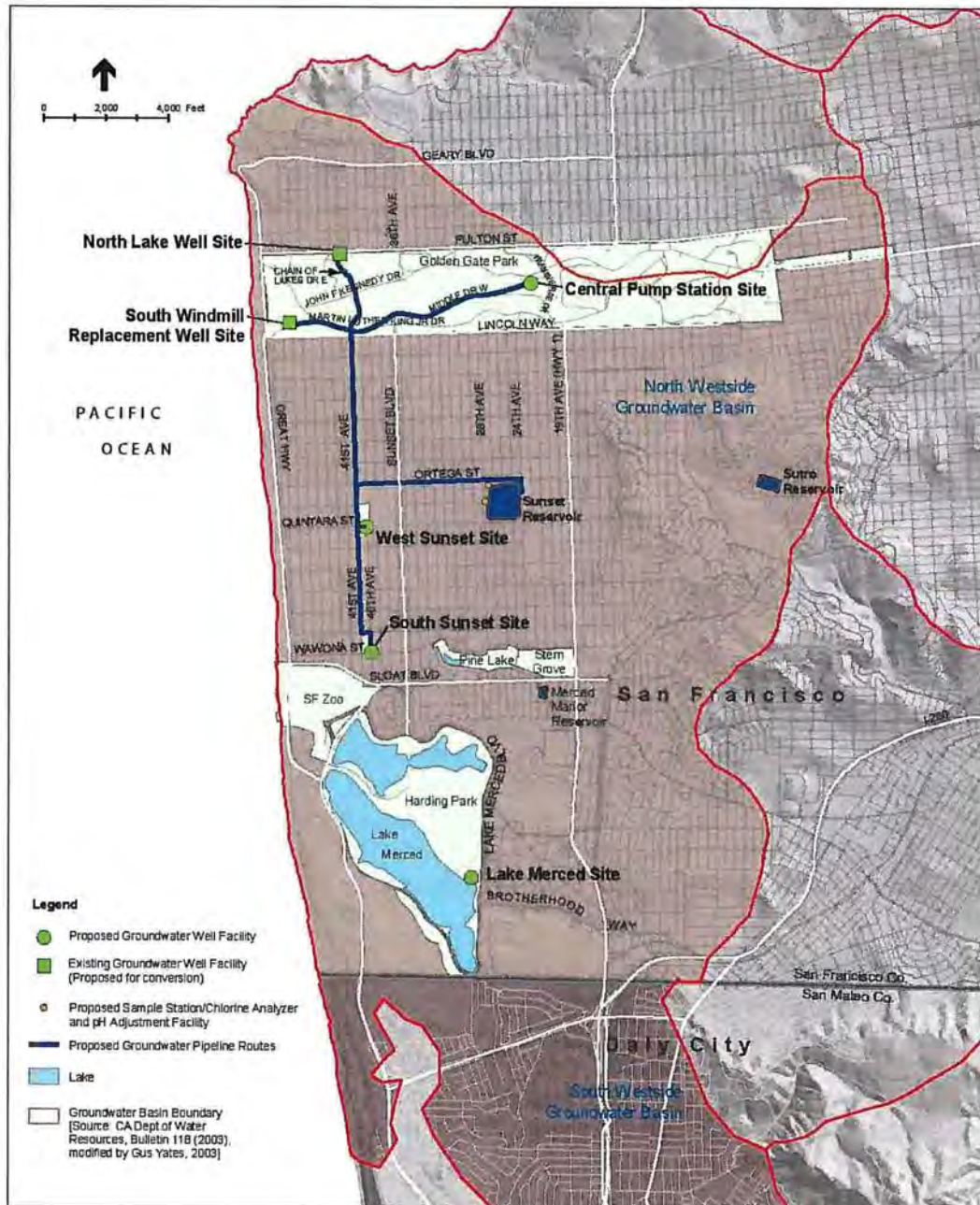
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<sup>13</sup> The primary source of information provided in this section is the SFPUC San Francisco Groundwater Supply Project Draft EIR (March 2013), which analyzes this project at a project-level of environmental review.



be disinfected and blended with imported surface water before entering the municipal drinking water system.

A distribution system (including pipelines and connection points) would connect five of the groundwater well facilities to Sunset Reservoir. The sixth well would connect to the Lake Merced Pump Station (which pumps water to both Sutro and Sunset Reservoirs). The groundwater would be blended with San Francisco's municipal water supply and distributed to local customers through the Sunset and Sutro Reservoirs. Figure 2 provides an overview schematic of the project and identifies the locations of all wells and the boundaries of the North Westside Groundwater Basin.



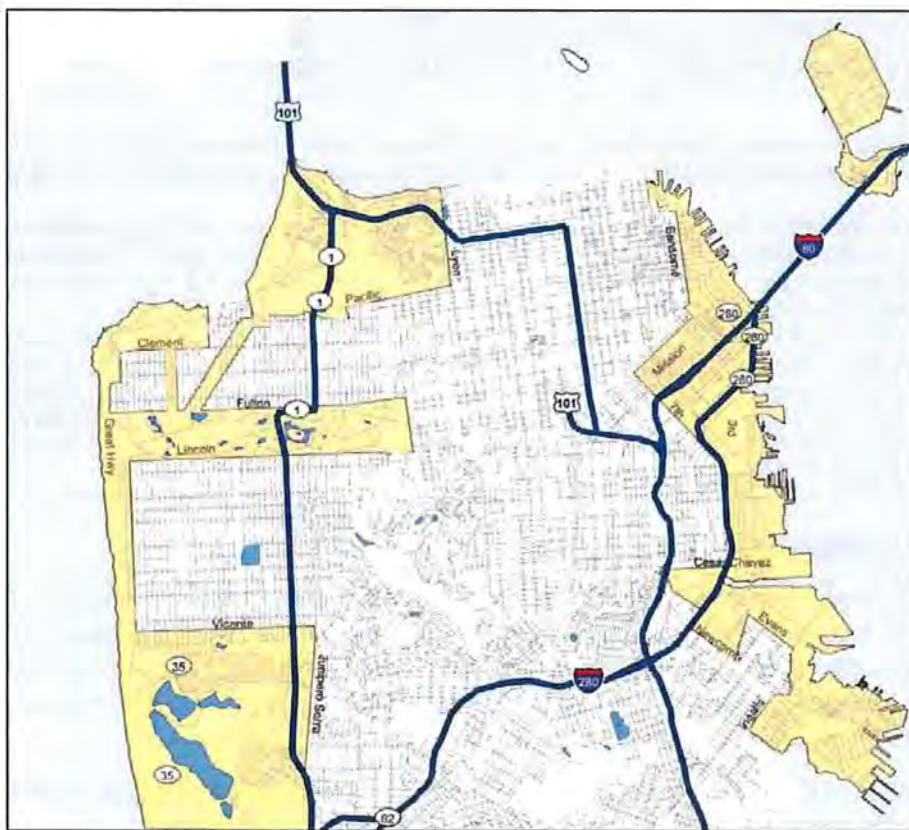
**Figure 2: San Francisco Groundwater Supply Project**



### 2.2.2 **Future Recycled Water Supply Projects**

The SFPUC also has plans to develop the proposed Westside and Eastside Recycled Water Projects in San Francisco (retail service area). These projects would provide up to 4 mgd of recycled water to a variety of users in San Francisco – primarily for landscape irrigation, toilet flushing, and industrial purposes – and are detailed below. Figure 3 shows areas on the western and eastern sides of the City that are designated for municipal recycled water use.

- The proposed Westside Project would construct a tertiary recycled water plant and associated pipelines to replace surface and groundwater currently used to irrigate Golden Gate Park, Lincoln Park and Golf Course, and the Presidio Golf Course. Additionally recycled water would be used for various non-potable uses in Golden Gate Park, including those at the California Academy of Sciences. The proposed treatment facility site was relocated to the SFPUC's Oceanside Plant in early 2012, and preliminary design for the new site is underway. The project-level environmental review for the new project is anticipated to begin in mid-2013.
- The SFPUC completed a recycled water demand assessment of potential customers on the eastern side of San Francisco, and identified a demand potential of up to 2 mgd to be served by the proposed Eastside Recycled Water Project. The planning of Eastside Recycled Water Project treatment and distribution facilities was initiated in late 2011, with the goal of identifying a preferred project in 2013. The WSIP contains funding for planning, design, and project-level environmental review for the proposed Eastside Recycled Water Project.



**Figure 3: San Francisco's Designated Recycled Water Use Areas**



### 2.3 Summary of Current and Future Retail Water Supplies

Table 3 provides a breakdown of current and projected water supply sources for meeting SFPUC retail water demand over the next 20 years.

**Table 3: SFPUC Retail Water Supplies 2015-2035 in a Normal Year (mgd)**

Water Supply Sources	2015	2020	2025	2030	2035
<b>Existing Supply Sources</b>					
RWS Watersheds - Retail Allocation	81.0	81.0	81.0	81.0	81.0
Suburban Groundwater & Subsurface Diversions <sup>1</sup>	0.7	0.7	0.7	0.7	0.7
North Westside Groundwater Basin <sup>2</sup>	1.5	1.5	1.5	1.5	1.5
Recycled Water - Harding Park & Sharp Park	0.3	0.3	0.3	0.3	0.3
<b>Existing Supplies Subtotal</b>	<b>83.5</b>	<b>83.5</b>	<b>83.5</b>	<b>83.5</b>	<b>83.5</b>
<b>Future Supply Sources<sup>3</sup></b>					
Future North Westside Groundwater Basin Expansion <sup>2</sup>	0.0	2.8	2.8	2.8	2.8
Future Recycled Water Projects	0.0	2.0	4.0	4.0	4.0
<b>Future Supplies Subtotal</b>	<b>0.0</b>	<b>4.8</b>	<b>6.8</b>	<b>6.8</b>	<b>6.8</b>
<b>TOTAL PROJECTED SUPPLIES</b>	<b>83.5</b>	<b>88.3</b>	<b>90.3</b>	<b>90.3</b>	<b>90.3</b>
<b>Notes:</b> <ol style="list-style-type: none"> <li>1. These sources consist of groundwater use at Castlewood (not connected to RWS) of approximately 0.4 mgd, and subsurface diversions to Sunol Golf of approximately 0.3 mgd taken from the Sunol Infiltration Gallery.</li> <li>2. The North Westside Groundwater Basin is currently used for irrigation. In-City groundwater use will be expanded for potable use with the San Francisco Groundwater Supply Project. Approximately 1.2 mgd of existing groundwater use will be converted to potable use (for a total of 4.0 mgd) once the Westside Recycled Water project is completed as a substitute irrigation water supply.</li> <li>3. The implementation of proposed future supply sources is contingent on completion of necessary project-level environmental review and project approval. If these supplies are not available as planned, and if retail demand exceeds the available water supply, the Water Supply Agreement allows the SFPUC to import additional water from the RWS, with mitigation implemented by the SFPUC and potential environmental surcharges if RWS deliveries exceed the 265 mgd interim supply limitation. (Total RWS deliveries in FY11/12 were 219.4 mgd.)</li> </ol>					

### 2.4 Dry-Year Water Supplies

As an established major water supplier for the Bay Area region, the SFPUC is responsible for securing and managing its existing RWS supplies and planning for future needs, as well as securing its own retail supplies. During a drought, the SFPUC projects that retail and wholesale customers would experience a reduction in the amount of water received from the RWS. The WSIP water supply program includes development of the following dry-year supplies for the RWS:

- Restoration of Calaveras Reservoir capacity via the Calaveras Dam Replacement Project, which is currently under construction and anticipated to be completed in 2018;
- Restoration of Crystal Springs Reservoir capacity via the Lower Crystal Springs Dam Improvements Project, which was completed in 2013;



- Recapture of Calaveras Reservoir releases via the Upper Alameda Creek Filter Gallery Project<sup>14</sup>, which is currently in the design phase and anticipated to be completed in 2019;
- Increase in groundwater storage volume and recapture via the Regional Groundwater Storage and Recovery (GSR) Project (a.k.a. Westside Basin Groundwater Conjunctive Use Project), for which the project-level Draft EIR was published on April 10, 2013, and construction is anticipated to be completed in 2016; and
- Water transfers, which are currently under negotiation.

The total available water supply during droughts would be allocated between wholesale and retail customers as described in Section 1.2.4.

Table 4 provides a breakdown of water supplies for meeting SFPUC retail demand over the next 20 years during Years 2 and 3 of multiple dry years. Local groundwater and recycled water supplies are assumed to remain constant regardless of a normal or dry year.

**Table 4: SFPUC Retail Water Supplies 2015-2035 in Years 2 and 3 of Multiple Dry Years (mgd)**

Water Supply Sources	2015	2020	2025	2030	2035
<b>Existing Supply Sources</b>					
RWS Watersheds - Retail Allocation	79.5	79.5	79.5	79.5	79.5
Groundwater & Subsurface Diversions <sup>1</sup>	0.7	0.7	0.7	0.7	0.7
North Westside Groundwater Basin <sup>2</sup>	1.5	1.5	1.5	1.5	1.5
Recycled Water - Harding Park & Sharp Park	0.3	0.3	0.3	0.3	0.3
<b>Existing Supplies Subtotal</b>	<b>82.0</b>	<b>82.0</b>	<b>82.0</b>	<b>82.0</b>	<b>82.0</b>
<b>Future Supply Sources<sup>3</sup></b>					
Future North Westside Groundwater Basin Expansion <sup>2</sup>	0.0	2.8	2.8	2.8	2.8
Future Recycled Water Projects	0.0	2.0	4.0	4.0	4.0
<b>Future Supplies Subtotal</b>	<b>0.0</b>	<b>4.8</b>	<b>6.8</b>	<b>6.8</b>	<b>6.8</b>
<b>TOTAL PROJECTED MULTIPLE DRY-YEAR SUPPLIES</b>	<b>82.0</b>	<b>86.8</b>	<b>88.8</b>	<b>88.8</b>	<b>88.8</b>
<b>Notes:</b> <ol style="list-style-type: none"> <li>1. These sources consist of groundwater use at Castlewood (not connected to RWS) of approximately 0.4 mgd, and subsurface diversions to Sunol Golf of approximately 0.3 mgd taken from the Sunol Infiltration Gallery.</li> <li>2. The North Westside Groundwater Basin is currently used for irrigation. In-City groundwater use will be expanded for potable use with the San Francisco Groundwater Supply Project. Approximately 1.2 mgd of existing groundwater use will be converted to potable use (for a total of 4.0 mgd) once the Westside Recycled Water project is completed as a substitute irrigation water supply.</li> <li>3. The implementation of proposed future supply sources is contingent on completion of necessary project-level environmental review and project approval. These sources are intended to diversify normal-year supplies and meet dry-year needs as well.</li> </ol>					

<sup>14</sup> Although the Upper Alameda Creek Filter Gallery Project is not listed as a dry-year water supply project under WSIP, it is listed in this section because the infrastructure required to make the releases are included in the Calaveras Dam Replacement Project scope.

Continued progress on the dry-year supply projects is an important component of the SFPUC's dry-year water supply program. As part of the reservoir capacity projects, the SFPUC agreed to provide instream flow releases below Calaveras Dam and Lower Crystal Springs Dam, as well as bypass flows below Alameda Creek Diversion Dam, to obtain required federal and state resource agency permits for construction of those projects. The instream flow release requirements for Alameda Creek and San Mateo Creek represent a potential decrease in available annual average water supply of 3.9 mgd and 3.5 mgd, respectively, for a total shortfall of 7.4 mgd on an average annual basis. These instream flow releases could potentially create a shortfall in meeting the SFPUC system wide demands of 265 mgd and slightly increase the SFPUC's dry-year water supply needs. The effects of such a shortfall, if any, would occur upon completion of construction of both the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements Project, at the time when the SFPUC will be required to provide the instream flow releases. The SFPUC is currently exploring other future supplies to offset the 7.4 mgd, including:

- Development of additional conservation and recycling.
- Development of additional groundwater supplies.
- Securing of additional water transfer volumes.
- Increasing Tuolumne River supply.
- Revising the Upper Alameda Creek Filter Gallery Project capacity.
- Development of a desalination project.

If multiple dry years occur before the planned dry-year supply projects are implemented, then the SFPUC may impose measures to ensure a balance of supplies and demands. These measures include reducing system deliveries and imposing customer rationing.



### 3.0 Retail Water Demand Analysis

Retail water demands for the SFPUC are separated into In-City customers and suburban customers. Suburban customers are retail customers outside of San Francisco that are billed and served directly by the SFPUC and not through a wholesale agency (including San Francisco County Jail, San Francisco International Airport, NASA Ames Research Center, residents in Sunol and other commercial and residential customers). Suburban retail customer demands have remained relatively constant over the last 20 years. The suburban retail customer demands are not generated by the SFPUC's Retail Water Use Models, but are instead based on historic water use.

#### 3.1 Revised City of San Francisco Growth Projections

SF Planning used the updated growth projections to develop 2012 LUA projections, as detailed in Section 1.1 and in a memorandum from SF Planning to the SFPUC dated January 28, 2013 (Appendix A). This analysis results in a 2035 growth projection that differs from the 2010 UWMP. Table 5 compares the new 2012 LUA growth projections to those used in the 2010 UWMP in 5-year increments from 2015 to 2035.

**Table 5: 2035 Growth Projections for Households and Employment**

	2015	2020	2025	2030	2035
<b>Housing Units Projections</b>					
2009 LUA Projections (used in 2010 UWMP)	363,213	376,109	389,463	403,292	415,000
2012 LUA Projections	361,452	377,684	393,630	410,227	426,235
<b>Net Change</b>	<b>(1,761)</b>	<b>1,575</b>	<b>4,167</b>	<b>6,935</b>	<b>11,235</b>
<b>Employment Projections</b>					
2009 LUA Projections (used in 2010 UWMP)	569,720	599,060	631,790	665,030	698,790
2012 LUA Projections	621,722	677,531	691,342	706,848	733,858
<b>Net Change</b>	<b>52,002</b>	<b>78,471</b>	<b>59,552</b>	<b>41,818</b>	<b>35,068</b>

#### 3.2 Projected Retail Water Demands

In-City retail water demands are estimated using the City's Retail Water Use Models. The models were first developed in 2004 and updated in 2010 and again in 2012, as detailed below. The models incorporate economic and demographic forecast data, including projections of population, housing stock and employment. For additional information in regards to the model methodology, please see Section 4.1.5 of the 2010 UWMP.

In late 2012, SFPUC staff compared the last four years of actual conservation measure savings through fiscal year 2012 with forecasted savings for 2013 to 2018. The comparison showed that some measures could fall short of future estimates (mainly multi-family coin operated washing machines and multi-family toilet direct installs). In response, the SFPUC adjusted forecasted production for these measures. In light of the new growth projections and the model updates, the SFPUC reran the demand model and developed new water demand projections for In-City uses, as detailed in a memo from SFPUC staff dated February 22, 2013 (Appendix B). A summary of all retail water demands for SFPUC is presented in Table 6.



Table 6: San Francisco Retail Water Demands (mgd)

Water Use Entity	2012 <sup>1</sup>	2015	2020	2025	2030	2035
<b>In-City Retail Customers</b>						
Single-Family Residential <sup>2</sup>	16.1	16.7	15.5	14.8	14.4	14.3
Multi-Family Residential <sup>2</sup>	24.9	28.1	27.7	27.6	27.9	28.6
Non-Residential <sup>2</sup>	23.2	26.5	27.7	27.5	27.7	28.7
Other In-City Demands <sup>4,7</sup>	0.2	0.2	0.2	0.2	0.2	0.2
In-City Irrigation Uses <sup>5,7</sup>	1.5	1.5	1.5	1.5	1.5	1.5
Losses <sup>2,3</sup>	6.9	5.1	5.2	5.2	5.2	5.3
<b>In-City Retail Subtotal</b>	<b>72.8</b>	<b>78.1</b>	<b>77.8</b>	<b>76.8</b>	<b>76.9</b>	<b>78.6</b>
<b>Suburban Retail Customers</b>						
Single-Family Residential <sup>7</sup>	0.1	0.1	0.1	0.1	0.1	0.1
Non-Residential <sup>7</sup>	3.7	4.3	4.3	4.3	4.3	4.3
Hetch Hetchy Water & Power Customers <sup>6,7</sup>	1.2	1.2	1.2	1.2	1.2	1.2
<b>Suburban Retail Subtotal</b>	<b>5.0</b>	<b>5.6</b>	<b>5.6</b>	<b>5.6</b>	<b>5.6</b>	<b>5.6</b>
<b>Total Retail Demand</b>	<b>77.8</b>	<b>83.7</b>	<b>83.4</b>	<b>82.4</b>	<b>82.5</b>	<b>84.2</b>
<b>Notes:</b> <ol style="list-style-type: none"> <li>1. 2012 data are based on actual billing data.</li> <li>2. 2015-2035 projections were generated using the SFPUC Retail Demand Model and include savings from passive and active conservation.</li> <li>3. Losses reported for 2012 include meter under-registration. Losses for 2015-2035 exclude meter under-registration because they are included in the retail demand projections for residential and non-residential sectors. Meter under-registration losses are estimated at 2.2% of residential and 2.1% of non-residential sector demands. System losses excluding meter under-registration are estimated at 6.86% of sector demand.</li> <li>4. Builders and Contractors, Docks and Ships.</li> <li>5. Irrigation at Golden Gate Park, the Great Highway, and the San Francisco Zoo.</li> <li>6. Hetch Hetchy Water &amp; Power Customers include Lawrence Livermore National Laboratory, Groveland Community Services District and other incidental uses.</li> <li>7. 2015-2035 projections are based on average historic consumption, which has remained relatively constant over the past 20 years.</li> </ol>						

## 4.0 Supply and Demand Comparison

This section compares the SFPUC's retail water supplies and demands through 2035 utilizing the information presented in Sections 2.0 and 3.0. Table 7 compares the SFPUC's retail supplies and demand during normal-year, single dry-, and multiple dry-year periods. Currently, San Francisco has access to an annual average 83.4 mgd from all existing water supply sources. Beginning in 2016, the SFPUC's retail water supplies are projected to increase if the local groundwater and recycled water projects are approved and implemented. The demands estimated in this Study show that the 2012 LUA projections from SF Planning result in an increase in City retail demand. By 2035, the retail demand is estimated at 84.2 mgd, as shown in the figures below. Figure 4 compares the demand to normal-year supplies (from on Table 3), and Figure 5 compares demand to dry-year supplies (from Table 4).

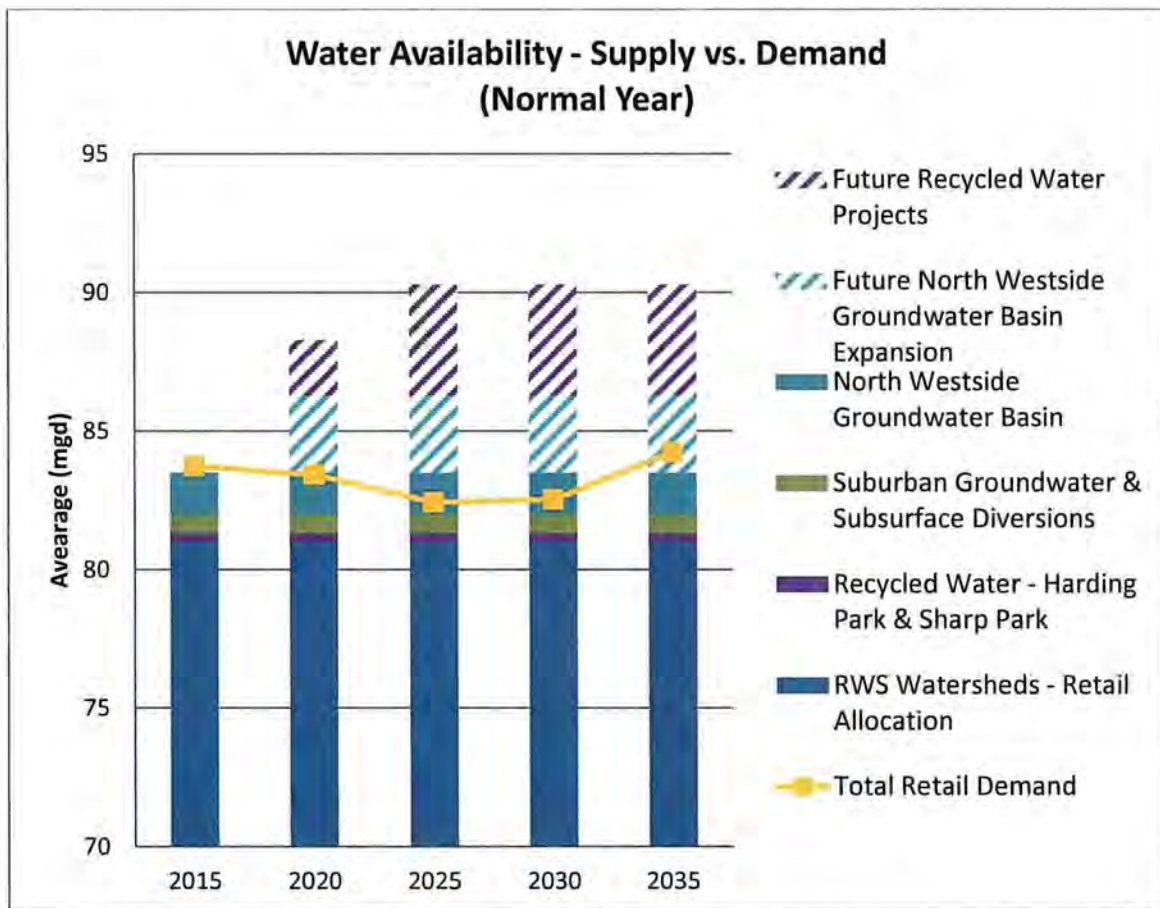
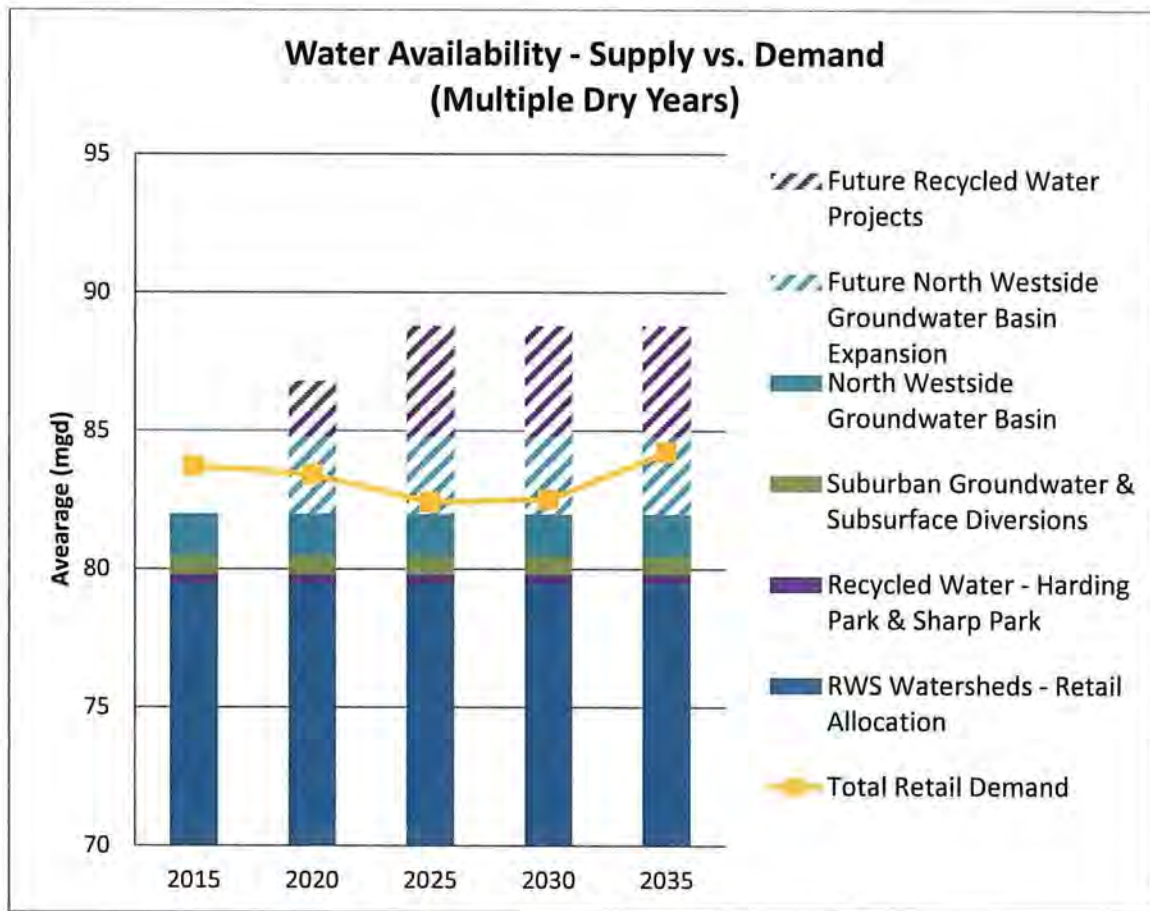


Figure 4: Normal-Year Supply and Demand Comparison





**Figure 5: Multiple Dry-Year Supply and Demand Comparison**

As shown in Table 7, the SFPUC, with its existing and future supplies, can meet the future demands of its retail customers in normal-, single dry-, and multiple dry-year events, with the exception of 2015. The deficit shown in 2015 can be attributed to a number of factors, including being within the margin of error and/or conservative assumptions of the demand model; propagated from aggressive near term employment and housing projections; and/or the result of demand increases prior to full implementation of the 10 mgd of new supplies under the Phased WSIP Variant. The deficit for 2015 in a normal year is 0.2 mgd, which represents less than a 0.25% shortfall. The deficit for 2015 in a multiple dry-year drought event is 1.7 mgd, which represents a 2.0% shortfall. These deficits could be easily managed through voluntary conservation measures or rationing. The SFPUC would have to declare a drought in 2014 to reach Year 2 of a multiple year event by 2015. As shown previously in Table 6, retail demand is currently lower than the 2015 projected demand (FY11/12 demand was 77.8 mgd). In the last 10 years, SFPUC's retail water demand has decreased by almost 10 mgd.

The other deficits shown in Table 7 are projected to occur if future supplies are not implemented as planned. The normal year deficits range from 0.2 to 0.7 mgd, which represent shortfalls of less than 1%. The multiply dry-year deficits range from 0.4 to 2.2 mgd, which represent shortfalls of up to 2.7%. These deficits are comparable to those described above for 2015 under normal-year conditions with future supplies, and could be easily managed through voluntary conservation measures or rationing.



**Table 7: Projected Supply and Demand Comparison (mgd)**

		Normal Year <sup>1,2</sup>	Single Dry Year <sup>1,2</sup>	Multiple Dry Years		
				Year 1 <sup>1,2</sup>	Year 2 <sup>2,3</sup>	Year 3 <sup>2,3</sup>
2015	Total Retail Demand	83.7	83.7	83.7	83.7	83.7
	Total Retail Supply – Existing Supplies Only <sup>4</sup>	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit)	(0.2)	(0.2)	(0.2)	(1.7)	(1.7)
	Total Retail Supply – Existing & Future Supplies <sup>4</sup>	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit) <sup>5</sup>	(0.2)	(0.2)	(0.2)	(1.7)	(1.7)
2020	Total Retail Demand	83.4	83.4	83.4	83.4	83.4
	Total Retail Supply – Existing Supplies Only <sup>4</sup>	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit)	0.1	0.1	0.1	(1.4)	(1.4)
	Total Retail Supply – Existing & Future Supplies <sup>4</sup>	88.3	88.3	88.3	86.8	86.8
	Surplus/(Deficit)	4.9	4.9	4.9	3.4	3.4
2025	Total Retail Demand	82.4	82.4	82.4	82.4	82.4
	Total Retail Supply – Existing Supplies Only <sup>4</sup>	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit)	1.1	1.1	1.1	(0.4)	(0.4)
	Total Retail Supply – Existing & Future Supplies <sup>4</sup>	90.3	90.3	90.3	88.8	88.8
	Surplus/(Deficit)	7.9	7.9	7.9	6.4	6.4
2030	Total Retail Demand	82.5	82.5	82.5	82.5	82.5
	Total Retail Supply – Existing Supplies Only <sup>4</sup>	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit)	1.0	1.0	1.0	(0.5)	(0.5)
	Total Retail Supply – Existing & Future Supplies <sup>4</sup>	90.3	90.3	90.3	88.8	88.8
	Surplus/(Deficit)	7.8	7.8	7.8	6.3	6.3
2035	Total Retail Demand	84.2	84.2	84.2	84.2	84.2
	Total Retail Supply – Existing Supplies Only <sup>4</sup>	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit) <sup>6</sup>	(0.7)	(0.7)	(0.7)	(2.2)	(2.2)
	Total Retail Supply – Existing & Future Supplies <sup>4</sup>	90.3	90.3	90.3	88.8	88.8
	Surplus/(Deficit)	6.1	6.1	6.1	4.6	4.6

**Notes:**

1. Normal-year retail water supplies per Table 3.
2. Retail water demands per Table 6.
3. Year 2 and 3 of multiple dry years per Table 4.
4. Existing and future supply sources per Table 3 (repeated in Table 4).
5. The deficit shown for 2015 in a normal year with existing and future supplies represents less than a 0.25% shortfall and during a multiple dry-year drought event represents a 2.0% shortfall, which can be easily managed through voluntary conservation measures or rationing. Current retail demand in FY11/12 was 77.8 mgd. If retail demand exceeds the available water supply of 83.5 mgd, the Water Supply Agreement allows the SFPUC to import additional water from the RWS, with mitigation implemented by the SFPUC and potential environmental surcharges if RWS deliveries exceed the 265 mgd interim supply limitation. (Total RWS deliveries in FY11/12 were 219.4 mgd.)
6. The deficit shown for 2035 is projected if none of the local groundwater and recycled water projects are implemented as described in Section 2.2.

Whether or not future supplies are available, if the SFPUC determines in a particular year that projected total RWS storage is less than target storage levels devised in relation to the design drought, it may implement the terms of the WSAP to achieve a combined average reduction in wholesale and retail water use of up to 20 percent. In addition, the SFPUC currently serves approximately 1.0 mgd to retail irrigation lessees on an interruptible basis. It is anticipated that the San Francisco Groundwater Supply Project will provide an additional 1.0 mgd of water supplies beginning in mid-2016.

In addition, if retail demand exceeds the available water supply of 83.5 mgd in normal years, the Water Supply Agreement allows the SFPUC to import additional water from the RWS. If combined retail and wholesale RWS deliveries exceed the 265 mgd interim supply limitation, the SFPUC retail customers would be required to pay an environmental enhancement surcharge for RWS deliveries over 81 mgd as detailed previously in Section 1.2.4. In addition, the SFPUC would need to implement mitigation measures per the WSIP PEIR as described in Section 1.2.3. (Total RWS deliveries in FY11/12 were 219.4 mgd.)

#### **4.1 Conclusion**

The updated 2012 SF Planning projections result in a retail demand in 2035 of 84.2 mgd, which represents a 3.3 mgd, or 4%, increase over the 2035 demand projections estimated in the 2010 UWMP. The ability to meet the demand of the retail customers is in large part due to development of 10 mgd of local WSIP supplies, including conservation, groundwater, and recycled water. These supplies are anticipated to be fully implemented over the next 10 years.

If planned, future water supply projects (i.e., San Francisco Groundwater Supply Project [or Westside Groundwater Basin Expansion], Westside Recycled Water Project, and Eastside Recycled Water Project) are not implemented, normal-year supplies may not be enough to meet projected retail demands. To balance any water supply deficits during normal years, the SFPUC may import additional water from the RWS, with mitigation implemented by the SFPUC and potential environmental surcharges if RWS deliveries exceed the 265 mgd interim supply limitation.

If dry-year supply projects (i.e., Calaveras Dam Replacement Project, Lower Crystal Springs Dam Improvements Project, Upper Alameda Creek Filter Gallery Project, GSR Project, and water transfers) are not implemented, existing dry year supplies may not be enough to meet projected retail demands. To balance any water supply deficits during dry years, the SFPUC may reduce system deliveries and impose customer rationing.

The SFPUC remains committed to meeting the level of service goals and objectives outlined under WSIP. In addition, the SFPUC is currently exploring other future supplies, including:

- Development of additional conservation and recycling.
- Development of additional groundwater supplies.
- Securing of additional water transfer volumes.
- Increasing Tuolumne River supply.
- Revising the Upper Alameda Creek Filter Gallery Project capacity.
- Development of a desalination project.

## **Appendix A - SF Planning Memorandum**





# SAN FRANCISCO PLANNING DEPARTMENT

January 28, 2013

Michael P. Carlin  
Deputy General Manager, SFPUC  
525 Golden Gate Street  
San Francisco, CA 94102

**Subject: Projections of growth 2015-2035**

Dear Michael:

I am forwarding you the Department's current growth projections as requested by Paula Kehoe, Manager, Water Resources Planning, SFPUC. Table 1 shows the projections for the requested years 2015-2035 from the Planning Department's long range Land Use Allocation (LUA) 2012.

Table 1: Development Projections					
	2015	2020	2025	2030	2035
Households	361,452	377,684	393,630	410,227	426,235
Jobs	621,772	677,531	691,342	706,848	733,858

**Source:** ABAG SCS 2012 (May). SF Planning, Land Use Allocation 2012.

The Planning Department routinely updates its long range LUA when ABAG updates their regional projections, typically, every two years. The Department uses the LUA for a variety of purposes, including analyzing impacts of plans and projects undergoing the environmental review process. This past summer, the Department updated its LUA for the recently released ABAG Sustainable Community Strategy Jobs-Housing Connections Scenario (ABAG SCS 2012).

In updating the LUA, the Department's method uses the best information available to allocate the growth to location. That information includes proposed and entitled projects (the "pipeline"), area plan development potential, and parcels with high development potential located outside area plan boundaries. The Planning Department assumed full buildout over the forecast period of the six large development projects at the beginning of their environmental review, namely Giants/Mission Rock (Sea Wall Lot 337 & Pier 48), Warriors Arena (Piers 30-32), Pier 70 Master Plan, 5M (901 Mission Street-Chronicle Building), Moscone Center Expansion, and the Central Corridor Plan.

If you or your staff have any questions, please contact Scott Edmondson, AICP, by email ([Scott.Edmondson@sfgov.org](mailto:Scott.Edmondson@sfgov.org)) or telephone (415-575-6818).

Sincerely,

John Rahaim  
Director of Planning

CC: Paula Kehoe (SFPUC), Scott Edmondson & Aksel Olsen (Planning Department)

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## **Appendix B - SFPUC Memorandum**



## MEMO

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February 22, 2013

To: Steve Ritchie, Assistant General Manager, Water Enterprise

From: Paula Kehoe, Water Resources Director

Re: Updates to 2011 Retail Conservation Plan

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This memo summarizes two areas of updated data that revise some conservation and demand estimates noted in the SFPUC's 2011 Retail Water Conservation Plan.

### 1) Updated Conservation Measure Production

The 2011 Retail Water Conservation Plan published in June 2011 notes a maximum conservation potential of 5 mgd demand reduction by 2018. The Plan also notes that the SFPUC regularly evaluates and reports on conservation activities. To that end, in late 2012, the SFPUC compared the last four years of actual conservation measure production through fiscal year 2012 with forecasted production for 2013 to 2018. The comparison showed that some measures could fall short of future estimates (mainly multi-family coin operated washing machines and multi-family toilet direct installs). In response, the SFPUC adjusted forecasted production for these measures, which resulted in a reduction of the overall estimated conservation potential to 4.1 mgd savings in 2018. The SFPUC intends to prepare a complete update of the Retail Water Conservation Plan every five years along with the Urban Water Management Plan. The next major update will be in 2015.

### 2) Updated Population and Employment Data

In January 2013, the San Francisco Planning Department provided the SFPUC updated population and employment projections for 2015 through 2035 from the Planning Department's long range Land Use Allocation (LUA) 2012. The Planning Department routinely updates its long range LUA when the Association of Bay Area Governments (ABAG) updates its regional projections, typically, every two years. These updated projections represent an increase in households in 2020 through 2035 and jobs in 2015 through 2035 used in the version of the SFPUC's forecast model that provided demand projections in the 2011 Retail Water Conservation Plan.

The attached, revised Tables 16 and 17 from the *SFPUC Retail Demand Model Update and Calibration Technical Memo* contained in Appendix A of the 2011 Retail Water Conservation Plan incorporate the updated conservation measure production, population and employment data noted in items 1 and 2 above.

Edwin M. Lee  
Mayor

Art Torres  
President

Vince Courtney  
Vice President

Ann Moller Caen  
Commissioner

Francesca Vietor  
Commissioner

Anson Moran  
Commissioner

Harlan L. Kelly, Jr.  
General Manager





**Table 16 - Revised 2/2013 to Reflect Updates to Measure Production, Housing and Employment Data**  
**SFPUC In-City Retail Demand Projection: 2005 - 2035**  
**(mgd)**

<b>Single Family In-City Retail Demand (mgd)</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Baseline Demand <u>without</u> Codes or SFPUC Conservation Programs	19.6	20.3	20.4	20.5	20.5	20.6	20.9
<i>Less Savings from Codes</i>	0.9	1.6	2.4	3.4	4.0	4.6	5.0
Adjusted Baseline Demand	18.7	18.7	17.9	17.1	16.5	16.0	15.8
<i>Less Savings from 2005-30 SFPUC Conservation Programs</i>	0.0	0.6	1.3	1.6	1.7	1.7	1.5
Demand with Codes & SFPUC Conservation Programs	18.7	18.1	16.7	15.5	14.8	14.4	14.3
<i>Savings from Codes &amp; SFPUC Conservation Programs</i>	0.9	2.2	3.7	4.9	5.8	6.3	6.5
<b>Multi Family In-City Retail Demand (mgd)</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Baseline Demand <u>without</u> Codes or SFPUC Conservation Programs	29.8	32.1	33.0	34.7	36.2	37.9	39.7
<i>Less Savings from Codes</i>	1.3	2.7	4.3	6.2	7.7	9.0	10.1
Adjusted Baseline Demand	28.4	29.3	28.8	28.5	28.6	28.9	29.6
<i>Less Savings from 2005-30 SFPUC Conservation Programs</i>	0.0	0.2	0.6	0.8	0.9	1.0	1.0
Demand with Codes & SFPUC Conservation Programs	28.4	29.1	28.1	27.7	27.6	27.9	28.6
<i>Savings from Codes &amp; SFPUC Conservation Programs</i>	1.3	2.9	4.9	7.0	8.6	10.0	11.2
<b>Non Residential In-City Retail Demand (mgd)</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Baseline Demand <u>without</u> Codes or SFPUC Conservation Programs	25.7	25.2	28.9	31.4	32.0	32.8	33.9
<i>Less Savings from Codes</i>	0.1	0.5	1.0	1.6	1.9	2.3	2.5
Adjusted Baseline Demand	25.6	24.7	27.9	29.9	30.0	30.5	31.4
<i>Less Savings from 2005-30 SFPUC Conservation Programs</i>	0.01	0.50	1.45	2.17	2.51	2.79	2.70
Demand with Codes & SFPUC Conservation Programs	25.6	24.2	26.5	27.7	27.5	27.7	28.7
<i>Savings from Codes &amp; SFPUC Conservation Programs</i>	0.1	1.0	2.5	3.7	4.5	5.1	5.2
<b>Other (mgd)</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Builders & Contractors, Docks & Shipping	0.2	0.2	0.2	0.2	0.2	0.2	0.2
<b>System Losses Excluding Meter Under-Registration (mgd)<sup>1</sup></b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Calculated as % of Adjusted Baseline Demand	5.0	5.0	5.1	5.2	5.2	5.2	5.3
<b>Total In-City Retail Demand (mgd)</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>	<b>2030</b>	<b>2035</b>
Baseline Demand <u>without</u> Codes or SFPUC Conservation Programs	80.3	82.8	87.7	92.0	94.2	96.7	100.0
<i>Less Savings from Codes</i>	2.3	4.8	7.7	11.1	13.7	15.8	17.7
Adjusted Baseline Demand	78.0	78.0	80.0	80.9	80.5	80.9	82.4
<i>Less Savings from 2005-30 SFPUC Conservation Programs</i>	0.0	1.3	3.3	4.6	5.2	5.5	5.2
Demand with Codes & SFPUC Conservation Programs	78.0	76.6	76.7	76.4	75.3	75.4	77.1
<i>Savings from Codes &amp; SFPUC Conservation Programs</i>	2.3	6.2	11.0	15.6	18.8	21.3	22.9
<b>Per Capita Demand (Gal/Day/Person)</b>							
Population (1,000)	787	835	855	875	896	917	963
Baseline Demand <u>without</u> Codes or SFPUC Conservation Programs	102	99	103	105	105	105	104
Adjusted Baseline Demand	99	93	94	92	90	88	86
Demand with Codes & SFPUC Conservation Programs	99	92	90	87	84	82	80

<sup>1</sup> Meter under-registration losses are included in the retail demands for residential and non-residential sectors.  
Meter under-registration losses estimated at 2.2% of residential and 2.1% of non-residential sector demands. System losses excluding meter under-registration estimated at 6.86% of sector demand of the "codes only" demand projection.

**Table 17 - Revised 2/2013 to Reflect Updates to Measure Production, Housing and Employment Data**  
**SFPUC In-City Retail Water Demand Projections: 2010 - 2020**  
**(mgd)**

<b>Single Family In-City Retail Demand (mgd)</b>	<b>2010</b>	<b>2012</b>	<b>2014</b>	<b>2016</b>	<b>2018</b>	<b>2020</b>
Baseline Demand <u>without</u> Codes or SFPUC Conservation Programs	20.3	20.3	20.3	20.4	20.4	20.5
<i>Less Savings from Codes</i>	1.6	1.9	2.3	2.6	3.0	3.4
Adjusted Baseline Demand	18.7	18.4	18.1	17.8	17.4	17.1
<i>Less Savings from 2005-30 SFPUC Conservation Programs</i>	0.6	0.9	1.1	1.3	1.5	1.6
Demand with Codes & SFPUC Conservation Programs	18.1	17.5	16.9	16.4	16.0	15.5
<i>Savings from Codes &amp; SFPUC Conservation Programs</i>	2.2	2.8	3.4	3.9	4.4	4.9
<b>Multi Family In-City Retail Demand (mgd)</b>	<b>2010</b>	<b>2012</b>	<b>2014</b>	<b>2016</b>	<b>2018</b>	<b>2020</b>
Baseline Demand <u>without</u> Codes or SFPUC Conservation Programs	32.1	32.5	32.8	33.4	34.0	34.7
<i>Less Savings from Codes</i>	2.7	3.3	4.0	4.6	5.4	6.2
Adjusted Baseline Demand	29.3	29.1	28.9	28.7	28.6	28.5
<i>Less Savings from 2005-30 SFPUC Conservation Programs</i>	0.2	0.4	0.5	0.7	0.7	0.8
Demand with Codes & SFPUC Conservation Programs	29.1	28.7	28.3	28.0	27.9	27.7
<i>Savings from Codes &amp; SFPUC Conservation Programs</i>	2.9	3.7	4.5	5.3	6.1	7.0
<b>Non Residential In-City Retail Demand (mgd)</b>	<b>2010</b>	<b>2012</b>	<b>2014</b>	<b>2016</b>	<b>2018</b>	<b>2020</b>
Baseline Demand <u>without</u> Codes or SFPUC Conservation Programs	25.2	26.7	28.2	29.4	30.4	31.4
<i>Less Savings from Codes</i>	0.5	0.7	0.9	1.1	1.3	1.6
Adjusted Baseline Demand	24.7	26.0	27.3	28.3	29.1	29.9
<i>Less Savings from 2005-30 SFPUC Conservation Programs</i>	0.5	0.9	1.3	1.6	1.9	2.2
Demand with Codes & SFPUC Conservation Programs	24.2	25.1	26.0	26.7	27.2	27.7
<i>Savings from Codes &amp; SFPUC Conservation Programs</i>	1.0	1.6	2.2	2.7	3.2	3.7
<b>Other (mgd)</b>	<b>2010</b>	<b>2012</b>	<b>2014</b>	<b>2016</b>	<b>2018</b>	<b>2020</b>
Builders & Contractors, Docks & Shipping	0.2	0.2	0.2	0.2	0.2	0.2
<b>System Losses Excluding Meter Under-Registration (mgd)<sup>1</sup></b>	<b>2010</b>	<b>2012</b>	<b>2014</b>	<b>2016</b>	<b>2018</b>	<b>2020</b>
Calculated as % of Adjusted Baseline Demand	5.0	5.1	5.1	5.1	5.2	5.2
<b>Total In-City Retail Demand (mgd)</b>	<b>2010</b>	<b>2012</b>	<b>2014</b>	<b>2016</b>	<b>2018</b>	<b>2020</b>
Baseline Demand <u>without</u> Codes or SFPUC Conservation Programs	82.8	84.8	86.7	88.6	90.3	92.0
<i>Less Savings from Codes</i>	4.8	6.0	7.1	8.4	9.7	11.1
Adjusted Baseline Demand	78.0	78.8	79.6	80.2	80.5	80.9
<i>Less Savings from 2005-30 SFPUC Conservation Programs</i>	1.3	2.1	2.9	3.6	4.1	4.6
Demand with Codes & SFPUC Conservation Programs	76.6	76.6	76.6	76.6	76.5	76.4
<i>Savings from Codes &amp; SFPUC Conservation Programs</i>	6.2	8.1	10.1	12.0	13.8	15.6
<b>Per Capita Demand (Gal/Day/Person)</b>						
Population (1,000)	835	843	851	859	867	875
Baseline Demand <u>without</u> Codes or SFPUC Conservation Programs	99	101	102	103	104	105
Adjusted Baseline Demand	93	93	94	93	93	92
Demand with Codes & SFPUC Conservation Programs	92	91	90	89	88	87

<sup>1</sup> Meter under-registration losses are included in the retail demands for residential and non-residential sectors. Meter under-registration losses estimated at 2.2% of residential and 2.1% of non-residential sector demands. System losses excluding meter under-registration estimated at 6.86% of sector demand of the "codes only" demand projection.

## **Attachment B –**

**Communications from San Francisco Planning Department**





# SAN FRANCISCO PLANNING DEPARTMENT

**MEMO**

**DATE:** June 13, 2013

**TO:** SF Planning EP Planners & SFPUC Planners

**FROM:** Scott T. Edmondson, AICP; Aksel Olsen

**RE:** Project Types Represented in the Land Use Allocation

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This Memorandum explains the Planning Department's Land Use Allocation (LUA) and the types of projects included in the LUA. The 2012 LUA is the most recent update and uses the Association of Bay Area Governments' (ABAG) May 2012 Jobs-Housing Connection Scenario. As this memorandum explains, the Planning Department expects that the LUA will encompass the vast majority of development proposals that project sponsors will present to the Planning Department. This memorandum also identifies possible unusual circumstances under which EP Planners and the SF PUC Planners may want to consult further with the Planning Department's Information and Analysis Group to determine whether a project is encompassed within the LUA.

## **ABAG's Projections of San Francisco's Economic Growth and the LUA**

The LUA takes ABAG's 30-year projections of citywide household and job growth and allocates them to smaller geographic units, in this case, the traffic analysis zones of the SF Transportation Authority's Countywide Transportation Model. Thus, the LUA does not project growth but simply allocates ABAG's growth projections to subarea locations within the city. The current 2012 LUA uses ABAG's Jobs-Housing Connection Scenario projections for San Francisco and covers the period from 2010 to 2040; these projections were released in May 2012 and are represented in five-year increments.

ABAG derives its demographic and economic growth projections from assumptions about long-term demographic and economic growth.<sup>1</sup> ABAG maintains its own set of regional models and develops each forecast with its in-house experts and private economic consultants.<sup>2</sup> The forecasting is informed by the best information and assumptions available through federal and State agencies, such as the State Department of Finance, and private sources. However, ABAG develops its forecast based on local knowledge from over 50 years of forecasting and develops the forecast to reflect local conditions in contrast to more general forecasting assumptions of State or federal sources. ABAG's estimate of total citywide growth for the 30-year period is expected to best represent actual growth at the end of the 30-year period. However, projected growth for any portion of the projection period, such as growth in a one-year or a five-year period, would be expected to vary from actual growth in such periods. Within the 30-year growth projection period, higher than average growth periods could be followed by lower than average growth periods such that growth over the period would ultimately equal the projected 30-year

total. All projection methodologies make assumptions based on the best available information at the time. To minimize the effects of imprecision intrinsic to any projections methodology when used in for planning decisions, ABAG follows professional best practices and updates its projections every two years. Accordingly, the Planning Department updates its LUA every two years. The planning practice of frequently updating projections and plans allows the incorporation of new information over time to provide for the most up-to-date projections.

The SFPUC updates its Urban Water Management Plan (UWMP) every five years. The UWMP typically relies on LUA projections or similar information. But, because the LUA is updated every two years, the SFPUC may want to review the LUA issued within SFPUC's 5-year UWMP cycle; and if it varies in a significant way from the SFPUC's projections used in its UWMP, discuss with Planning whether it should make any changes in its own water supply needs assessment during an UWMP cycle.

### **Types of Projects Included in the LUA**

The LUA translates ABAG's projected household and job growth into total expected development in San Francisco over a 30-year period. The LUA translates ABAG's household growth into residential housing units and ABAG's job growth into commercial space.<sup>3</sup> Thus, the LUA projections of housing units and commercial space include all project types expected from San Francisco growth, such as housing, office, retail, production-distribution-repair (PDR), visitor, and cultural-institutional-educational (CIE). The LUA does not exclude any project type or potential growth. As such, the LUA and the ABAG economic projections upon which it is based contain the best estimates available of reasonably foreseeable growth and development in San Francisco over a 30-year period.

### **Unusual Circumstances**

The LUA can be considered to include all reasonably expected growth and development and it is frequently updated to correct for expected variations. Nevertheless, there are possible unusual circumstances under which the EP Planners or SFPUC Planners may want to request further Planning Department consultation with the Information and Analysis Group to determine if a particular project falls within the LUA. ABAG's projections and the Department's LUA take into account urban economic trends and based on that information capture all reasonably foreseeable growth in San Francisco. Limited capital and aggregate demand of any urban economy constrains growth. However, occasionally the reality or perception may arise that a project lies outside the normal growth constraints of the San Francisco economy for some reason, and therefore lies outside ABAG's projection's and the Department's current spatial allocation in its LUA.

One can envision the rare case of a project arising outside the City's economy (demand and capital) from an organization not located in San Francisco using nonprofit foundation funds or private donations to construct a large institutional project in San Francisco, such as a major hospital, a university, or an office complex. These projects would represent spending and demand beyond that normally active in the San Francisco economy, and therefore represent net additions to projected growth beyond that captured by ABAG's projections and reflected in the Department's LUA. Indicative characteristics of such projects

would include those with non-local sponsors, of large size, and for an institutional land use. Alternatively, very large project proposals from local project sponsors active in the SF economy involving a large site, land assembly, a planned unit development (PUDs), master plans, or area plan and rezoning proposals may warrant individual assessment for a range of reasons even though they are likely captured in ABAG's projections and the LUA. Such projects would be similar to recent projects such as Hunters Point/Candlestick, Park Merced, Treasure Island, Pier 70 Master Plan, Eastern Neighborhoods, or the Transit Center District Plan.

The bi-annual update of ABAG's projections and the LUA would be able to capture development associated with such projects. However, should such a project be proposed between updates, the EP Planners and SFPUC could treat its appearance as sufficient cause to request the Planning Department's assistance in determining whether to consider the project outside the latest LUA projections.

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<sup>1</sup> Please see ABAG's summary of its research and forecasting on its website: <http://www.abag.ca.gov/planning/research/index.html>

<sup>2</sup> ABAG describes its current Jobs-Housing Scenario policy-based forecast here:  
[http://onebayarea.org/pdf/JHCS/May\\_2012\\_Jobs\\_Housing\\_Connection\\_Strategy\\_Appendices\\_Low\\_Res.pdf](http://onebayarea.org/pdf/JHCS/May_2012_Jobs_Housing_Connection_Strategy_Appendices_Low_Res.pdf).

<sup>3</sup> The LUA citywide totals only differ slightly, up to within one percent of ABAG totals (+/-). The difference is produced by LUA's complex method of translating ABAG projections into development (residential units and commercial space) and allocating total citywide growth to subarea locations. The minor difference between the LUA and ABAG citywide totals is real in absolute terms, but not in the sense that they are different projections. The one percent difference does not constitute a difference of projections. ABAG and MTC consider variation of one percent in citywide totals, plus or minus, as sufficiently representing ABAG's projections for consistency with the MTC regional projections and modeling purposes (congestion management, etc.). Even if a few versions of the LUA must be done to make minor subarea spatial allocation corrections, as long as the LUA's citywide totals are within one percent of ABAG's projections, and ABAG's projections have not changed, the LUA citywide totals have not effectively changed either. Any of those LUA versions' citywide totals fully represent the same unchanged ABAG projection totals.



## **Attachment C –**

### **Golden State Warriors Project Demand Memo**



# SAN FRANCISCO PLANNING DEPARTMENT

**MEMO**

**DATE:** May 6, 2013  
**TO:** Fan Lau, SFPUC  
**FROM:** Chris Kern, Environmental Planning  
**CC:** Elizabeth Purl, Environmental Planning  
Brett Bollinger, Environmental Planning  
**RE:** Golden State Warriors Project Water Supply Assessment Request

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The purpose of this memorandum is to request that the San Francisco Public Utilities Commission (SFPUC) prepare a Water Supply Assessment (WSA) for the proposed Golden State Warriors project at Piers 30-32 and Seawall Lot 330 in compliance with CEQA Guidelines Section 15155 and Sections 10910 through 10915 of the California Water Code. The project sponsor has provided project information intended to meet the requirements outlined in the SFPUC memo dated March 13, 2013 entitled "Project Demand Memo for Preparation of WSA." A summary of the project description and estimated project water demand, both prepared by the project sponsor's consultant, are attached.

Should you have questions or need additional information from the Planning Department or the project sponsor, please contact me at 415-575-9037 or [chris.kern@sfgov.org](mailto:chris.kern@sfgov.org) or Elizabeth Purl at 415-575-9028 or [elizabeth.purl@sfgov.org](mailto:elizabeth.purl@sfgov.org).



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Redwood City, CA 94065  
(650) 482-6300, Fax (650) 482-6399

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## TECHNICAL MEMORANDUM

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**Date:** May 31, 2013

**BKF No.:** 20136004

**To:** Clarke Miller  
Strada Investment Group

**Copies To:**

**From:** Sravan Paladugu, P.E.  
Jacob Nguyen, P.E.

**Subject:** Piers 30-32 and Seawall Lot 330 – Water Demand Memorandum

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The purpose of this memorandum is to discuss the approach used in determining future water demand for the proposed development at Piers 30-32 and Seawall Lot 330 (Project) located in San Francisco, California. This technical memorandum will assist San Francisco Public Utilities Commission (SFPUC) in preparing the Water Supply Assessment (WSA) for the Project per California Water Code Sections 10910 et seq.

The memorandum dated March 13, 2013, from SFPUC requires Project proponents to provide, a) a description of the Project, and b) proposed indoor and outdoor water uses, as part of the Project Demand Memo. The following sections discuss the required items in detail.

### **A. Project Description**

GSW Arena LLC (GSW) proposes to construct a multi-purpose event center and a mixed use development at two sites that are adjacent to The Embarcadero, just south of the Bay Bridge. The event center will be located on Piers 30-32 site, which is at the southeast corner of The Embarcadero and Bryant Street. The mixed use development will be located on Seawall Lot 330 which is at the southwest corner of The Embarcadero and Bryant Street, directly across from Piers 30-32.

#### **Piers 30-32**

Piers 30-32 site is approximately 13-acres and is currently vacant except for a small restaurant building and surface parking. GSW proposes to construct a multi-purpose event center, public open space, a parking facility, maritime uses and visitor-serving retail uses. A summary of the various components of Pier 30-32 are included in Table 1 and are discussed below.

#### Event Center

The proposed event center would have a seating capacity of 18,000 seats, encompass approximately 728,000 gross square feet in area. The event center would serve as the new home of the Golden State Warriors. The event center would host all the home games for the Golden



State Warriors, as well as provide a year-round venue for a variety of other uses including concerts, family shows, conferences, conventions and other sporting events.

The event center main floor would include a full length NBA basketball court for Warriors basketball games, which can also accommodate a stage for performances. Other supporting event center facilities would include player/performer locker rooms, club and press areas, concessions, restrooms, a commissary, and a large marshalling area. The Warriors practice facility and support offices would also be integrated within the event center.

The practice facility would include two full-length NBA basketball courts with approximately 21,000 square feet of playing surface, a weight room and medical treatment facilities, locker rooms, and a players' lounge. A multi-purpose room of approximately 2,000 square feet would be used as a community amenity, including events such as community meetings. The support offices would accommodate Warriors management, coaching and operations staff, administration, finance, marketing, broadcasting, merchandising, public relations, and ticket operations.

#### Open Space Uses

The Piers 30-32 improvements would be designed to integrate public access and open space and to provide public view corridors of San Francisco Bay. At least 50 percent of the area of Piers 30-32 is proposed to be open space. Large areas of the plazas would be landscaped.

#### Other Uses

The Piers 30-32 improvements would include approximately 25,000 square feet of retail and 80,000 square feet of restaurants. The retail and restaurant uses would mainly be in proposed buildings along The Embarcadero. Some retail uses may also be incorporated into the event center as well. A parking garage consisting of approximately 500 spaces would serve the proposed uses and would be completely enclosed within the development.

Table 1 below provides a summary of the proposed land-uses, gross square footage, types of events, and number of days that the events are anticipated to occur. The employment and average event attendance figures are provided by GSW for the purpose of calculating water demand.

**Table 1 – Piers 30-32 Summary of Proposed Land-Uses**

Project Component	Floor Area (GSF)	Capacity/ No. of Seats	Event Type	No. of Events Per Year	Full-time Employees	Event Employees	Average Attendance
Event Center	728,000	18,000	Pre-season games	3	n/a	550	11,000
			Regular season games	41	n/a	550	17,000
			Playoffs (Maximum possible)	16	n/a	550	18,000
			Total non-Warriors Events	161			
			- Concerts	45	n/a	450	12,500
			- Other Sporting	30	n/a	350	7,000
			- Family Shows	55	n/a	350	5,000
			- Other Rentals	31	n/a	350	9,000
Practice Facility & Training Areas <sup>(1)</sup>	21,000		Practice/training	n/a	Part of management staff below	30	n/a
Community Room <sup>(1)</sup>	2,000		Meetings	125	0	0	50
Event Management & Team Operations <sup>(1)</sup>	40,000	n/a		240	250	n/a	n/a
Kitchen <sup>(1)</sup>	32,260	n/a		n/a	n/a	Part of Event staff above	n/a
Retail	25,000	n/a		n/a	100	n/a	2400
Restaurants	80,000	800		n/a	150	n/a	
Fire House	18,000	n/a		n/a	11	n/a	
Parking (stalls)	500						
Landscape Area (at all levels) <sup>(2)</sup>	65,340						
Open Space (other than landscaped areas)	229,700						

(1) The 728,000 GSF noted for the event center includes the square footage identified for these uses.

(2) A higher value (1.5 acres) is used than the current landscape design area of 1.28 acres to be conservative.

**Seawall Lot 330**

Seawall Lot 330 (SWL 330) is approximately 2.3-acres and is currently used as a surface parking lot. GSW proposes to construct a mixed use development, including residential, hotel and retail uses.

The proposed development would include a four-story building (ground level plus three podium levels), above which one 13-story residential tower and a 7-story hotel tower would be developed. The ground level and second floor of the podium facing the Embarcadero would accommodate retail and restaurant uses.

The Project site would include approximately 259 parking spaces within an above-grade garage that is completely enclosed by the proposed residential, hotel and retail uses. The garage would provide off-street parking and loading for residential and hotel uses within the development.

Table 2 below, summarizes the principal characteristics of the proposed uses and gross square footage. Seawall Lot 330 will include landscape areas at ground level and green roof areas above the podium. The landscape and green roof areas will be integrated into the proposed stormwater managed system. The Project will include a swimming pool and two hot tubs, one for residential use and the other for hotel use. Construction at Seawall Lot 330 is anticipated to begin in 2015.

The approximate number of employees expected to serve in the residential, hotel, retail and restaurant uses are provided by Strada Investment Group, the Project development manager.

**Table 2 – Seawall Lot 330 Summary of Proposed Land-Uses**

<b>Project Component</b>	<b>Floor Area (GSF)</b>	<b>No. of Units</b>	<b>Average Unit Size (Sq.Ft.)</b>	<b>Expected Full-time Employees</b>
Residential	208,844	176	1187	12
Hotel	178,406	227	786	182
Retail	22,017	n/a	n/a	73
Restaurant	7,837	n/a	n/a	26
Parking (off-street)	106,339	259		
Landscape (terrace & green roof)	15,000			
Pool & Spa	1,225			



## **B. Water Demand**

The water demand for the proposed Project was calculated using the gross square footage of different land-uses and forecasted employment and visitor attendance data provided by GSW and Strada. The Project indoor water consumption primarily includes water used in restrooms, bathrooms, kitchen, laundry, and by cooling appliances. Proposed outdoor uses include water used for irrigating landscaped areas and cleaning hardscape areas. Water consumption for the proposed land uses was estimated based on: a) end-use data (i.e, fixture and/or appliance) where there is adequate project data to reasonably predict uses, and, b) using standard consumption factors developed for similar land-uses as part of research studies and other projects' water demand assessments.

### **Piers 30-32**

#### *Event Center*

The end-use approach of estimating demand is applied to restroom usage at the Event Center. Restroom usages include showers, lavatory faucets, urinals and water closets. Because the events hosted at the Event Center are expected to attract a significant crowd of spectators, the restroom water usage is anticipated to account for approximately half of the total Project water consumption. The restroom end-use fixture baseline flow rates, duration and average daily use were taken from LEED. The LEED recommended average daily use of fixtures was increased where deemed necessary to reflect Project specific use. For example, average restroom use was assumed to be used by 100% of visitors.

The end-use water demand is calculated separately for full-time employees versus visitors. Also, the demand calculated for a full-time employee is reduced by 25% to calculate demand for part-time event employees who are anticipated to work 6-hours during event days. Conservative assumptions were made to estimate onsite laundry water demand. Laundry items such as bath towels and sports towels are assumed to be generated from 30% of the employees. The factors used in calculating water consumption by the end-use approach are presented in Table 9.

Standard water consumption factors are used for other Event Center uses such as food services and HVAC/cooling, for which end-use details are not available. A standard factor for fast food restaurants was used to estimate the Event Center food service water demand. This approach is conservative in that fast food restaurants typically operate during longer hours than the food service areas at the Event Center, which are limited to event hours.

#### *Other Components*

Other land uses at the Project site include retail, restaurants and open space areas. The indoor water consumption at retail stores include water used in restrooms by employees and customers. The retail water use is estimated based on the end-use approach similar to the Event Center restroom usage. The factors used in calculating water consumption by end-use and references are presented in Table 9. The proposed restaurant land-use will include quick serve food areas and sit-down restaurants. Standard water consumption factors were used to estimate demand for both types of restaurant uses.

Outdoor water uses at the site will include water used for cleaning hardscape areas and irrigating landscaped areas. The irrigation water demand is estimated using San Francisco's average monthly rainfall, evapotranspiration and plant species factors provided in the outdoor water demand calculators developed by the California State Water Resources Control Board and SFPUC. A plant species factor of 0.5 was used for all landscape areas. The water used for cleaning outdoor hardscape areas and indoor facilities (i.e., event center floor areas, walkways, windows, restrooms, etc) was based on information gathered from local vendors.

### **Seawall Lot 330**

#### *Residential Component*

The end-use approach of estimating water demand is applied for the proposed multi-family residential component. The end-uses identified include bathtub, showers, restroom faucets, toilets, clothes washing, dish washing and kitchen faucet uses. The baseline fixture flow rates and duration for showerhead, toilet (water closet), bathroom faucet and kitchen faucet were taken from the 2009 LEED Reference Guide for Green Building Design and Construction. Flow rate and duration for bathtub, washing machine and dishwasher were taken from the SFPUC 2010 Urban Water Management Plan (UWMP) Retail Demand Model for New Multi-Family Residential Water Use model (Retail Demand Model). The average daily use of fixtures and appliances were also taken from the Retail Demand Model. The flow rates, duration and average daily use data is not readily available from the 2011 UWMP Retail Demand Model documentation but are provided as part of the Non-Potable Water Calculator (NP Calculator) developed by SFPUC. As suggested in the 2011 UWMP, 2 residents per dwelling was used to estimate water consumption per dwelling unit. The factors used in calculating water consumption by end-use and references are presented in Table 11.

#### *Hotel Component*

The hotel water demand is generated by employees, hotel guests, in-house laundry operations and HVAC/cooling facilities. Similar to the residential, demand for hotel water consumption was estimated using end-use approach. It is not known at this time if laundry operations will be carried in-house or contracted to outside commercial laundry places. To conservatively estimate demand, it was assumed that the hotel will have an onsite laundry facility to wash clothing generated from guest rooms. It is assumed that each room will generate approximately 8 pounds of towels and bed sheets per day. The HVAC/cooling demand was estimated using the water consumption per square feet of floor area provided in the Potable Offset Investigation Summary Report, dated April 2012. The factors used in calculating water consumption by end-use and references are presented in Table 11.

#### *Retail Component*

The primary water consumption within the retail uses is water used by employees and customers in restrooms. Restroom usages include lavatory faucets, urinals and toilets (water closets). The end-use fixture baseline flow rates, duration, and average daily use were taken from the 2009 LEED Reference Guide. The factors used in calculating water consumption by end-use and references are presented in Table 11.

### *Restaurant Component*

A standard consumption factor developed by American Water Works Association (AWWA) was used to predict restaurant water use. The factors used in calculating water consumption are presented in Table 11.

### *Outdoor Components*

Outdoor water uses at the site will include water used for pool and spa areas, cleaning hardscape areas and irrigating landscaped areas. The irrigation water demand is estimated using San Francisco's average monthly rainfall, evapotranspiration and plant species factors provided in the outdoor water demand calculators developed by the California State Water Resources Control Board and SFPUC. A species factor of 0.5 was used for all landscape areas. The water used for cleaning parking and other outdoor hardscape areas was based on information gathered from local vendors.

### **Baseline Water Demand**

The baseline demand is calculated by applying the baseline fixture flow rates provided in the 2009 LEED Reference Guide (LEED) to end-uses. Table 3 below summarizes the baseline water demand for the various components of the Project.

**Table 3 – Summary of Baseline Water Demand**

<b>Project</b>	<b>Project Component</b>	<b>Floor Area (GSF)</b>	<b>Water Use (MGD)</b>
<b>Piers 30-32</b>	Event Center	728,000	0.031
	Retail	25,000	0.004
	Restaurant	80,000	0.031
	Fire House	18,000	0.001
	Landscape	65,340	0.001
	Washdown & Facility Cleaning		0.002
		Sub Total	0.070
<b>Seawall Lot 330</b>	Residential	208,844	0.020
	Hotel	178,406	0.029
	Retail	22,017	0.002
	Restaurant	7,837	0.003
	Landscape (terrace & green roof)	15,000	0.001
	Pool & Spa	1,225	0.001
	Washdown (parking & other outdoor hardscape areas)		0.000
		Sub Total	0.055
	<b>Total</b>		<b>0.126</b>

Note: See Table 7 and Table 10 (attached) for detailed calculations used in determining the baseline water demand.



**Adjusted Water Demand for Code (with Water Conservation)**

Water conservation measures required as part of the 2011 San Francisco Green Building (SFGB) requirements of Chapter 13C of the San Francisco Building Code will be implemented by the Project. The conservation measures include reducing water consumption using fixtures with low flow rates prescribed by the SFGB requirements for prescriptive approach (Table 13C.5.303.2.3). As such, the baseline demand in the section above was adjusted to new fixture flow rates to calculate the actual anticipated demand.

Other water conservation techniques such as use of water efficient pre-rinse spray valves for food preparation, energy efficient clothes washers and dish washers, and cooling appliances may be used throughout the Project but are not included in calculating water demand. The total water demand after application of conservation measures is shown in the Table 4 below.

**Table 4 – Summary of Adjusted Water Demand for Code**

<b>Project</b>	<b>Project Component</b>	<b>Floor Area (GSF)</b>	<b>Water Use (MGD)</b>
<b>Piers 30-32</b>	Event Center	728,000	0.024
	Retail	25,000	0.003
	Restaurant	80,000	0.031
	Fire House	18,000	0.001
	Landscape	65,340	0.001
	Washdown & Facility Cleaning		0.002
	Sub Total		0.062
<b>Seawall Lot 330</b>	Residential	208,844	0.016
	Hotel	178,406	0.025
	Retail	22,017	0.001
	Restaurant	7,837	0.003
	Landscape (terrace & green roof)	15,000	0.001
	Pool & Spa	1,225	0.001
	Washdown (parking & other outdoor hardscape areas)		0.000
	Sub Total		0.047
<b>Total</b>			<b>0.109</b>

Note: See Table 8 and Table 10 for detailed calculations used in determining water demand with conservation measures.

The total water demand for the proposed Project is estimated to be 0.109 MGD. Construction of the Project is anticipated to begin in 2015 with completion in 2017. A summary of the anticipated water demand for project phasing is shown below in Table 5.

**Table 5 – Water Demand based on Project Phasing**

	<b>2015</b>	<b>2017</b>	<b>2020</b>
<b>Total Demand of proposed Project (MGD)</b>	<b>0</b>	<b>0.109</b>	<b>0.109</b>

The anticipated total water demand for the proposed Project during normal years and single or multiple dry years is shown below in Table 6.

**Table 6 – Water Demand based on Water Year Type**

	<b>Normal</b>	<b>Single dry</b>	<b>Multiple 2</b>	<b>Multiple 3</b>
<b>Total Demand of proposed Project (MGD)</b>	<b>0.109</b>	<b>0.109</b>	<b>0.109</b>	<b>0.109</b>

### **C. Attachments**

Table 7: Piers 30-32 Water Demand by Project Component – Baseline

Table 8: Piers 30-32 Water Demand by Project Component – Adjusted for Code (with Water Conservation)

Table 9: Piers 30-32 Water Consumption by End-Use (Baseline and Adjusted)

Table 10: SWL330 Water Demand by Project Component (Baseline and Adjusted)

Table 11: SWL330 Water Consumption by End-Use (Baseline and Adjusted)

#### **D. References**

American Water Works Association. Commercial and Institutional End Uses of Water, 2000

California Building Standards Commission. 2009. 2008 California Green Building Standard Code. California Code of regulations, Title 24, Part II.

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EPA Water Sense, 2009. Water Efficiency in the Commercial and Institutional Sector: Considerations for a Watersense Program.

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Pacific Institute, 2003. Waste Not, Want Not: The Potential for Urban Water Conservation in California, November 2003.

US Green Building Council, 2009. 2009 LEED Reference Guide For Green Building Design and Construction.

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San Francisco Public Utilities Commission, 2011. 2010 Urban Water Management Plan for the City and County of San Francisco.



[illegible]

**Table 8 - Pier 30-32 Water Demand by Project Component - Adjusted**

[illegible]

Event Center End Uses		Baseline					Adjusted for Code		
<b>1. Visitors</b>									
Type	Baseline Rate <sup>(a)</sup>	Unit	No. of Units <sup>(c)</sup>	Unit	Ave Daily Use <sup>(c)</sup>	GPD per Visitor	Rate (w/ Code) <sup>(a)</sup>	Unit	GPD per Visitor
Lavatory Faucet	0.5	gal/min	0.25	min	1	0	0.4	gal/min	0
Urinals	1	gal/flush	1	flush	1	1	0.5	gal/flush	1
Toilet (Water Closet)	1.6	gal/flush	1	flush	1	2	1.28	gal/flush	1
Misc						0			0
						3			2
<b>2. Full-Time Employees</b>									
Type	Baseline Rate <sup>(a)(b)</sup>	Unit	No. of Units <sup>(b)(d)</sup>	Unit	Ave Daily Use <sup>(b)(d)</sup>	GPD per Employee	Rate (w/ Code) <sup>(a)</sup>	Unit	GPD per Employee
Showerhead	2.5	gal/min	5	min	0.3	4	2	gal/min	3
Lavatory Faucet	0.5	gal/min	0.25	min	3	0	0.4	gal/min	0
Urinals	1	gal/flush	1	flush	2	2	0.5	gal/flush	1
Toilet (Water Closet)	1.6	gal/flush	1	flush	4	6	1.28	gal/flush	5
Kitchen Faucet	2.2	gal/min	0.25	min	1	1	1.8	gal/min	0
Laundry	4	gal/pound	0.5	pound	0.3	1	4	gal/pound	1
						14			10
Notes:									
(a) Baseline flow rate for showerhead, bathroom faucet, toilet, urinals and kitchen faucet are taken from 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 1).									
(b) Gallons of water used by laundry per pound of fabric is taken from webpage @ <a href="http://www.allianceforwaterefficiency.org/commercial_laundry.aspx">http://www.allianceforwaterefficiency.org/commercial_laundry.aspx</a> . The equipment type is assumed to be a washer-extractor which is typical for small to medium size laundries. Laundry is assumed to be generated by players and event performers from showers and other activities. 30% of all the employees are assumed to be players and event performers.									
(c) Duration and Average daily use suggested in the 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 2) were increased to be specific to event uses. All visitors/spectators are assumed to use the restrooms.									
(d) Duration and Average daily use of fixture flow rates are taken from 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 2). Average daily use of showerhead is increased from 0.1 to 0.3.									
(e) Flow rate based on maximum flow rate prescribed by 2011 SF Green Building Requirements (Table 13C.5.303.2.3).									
Retail End Uses		Baseline					Adjusted for Code		
<b>1. Customer</b>									
Type	Baseline Rate <sup>(a)</sup>	Unit	No. of Units <sup>(b)</sup>	Unit	Ave Daily Use <sup>(b)</sup>	GPD per Customer	Rate (w/ Code) <sup>(a)</sup>	Unit	GPD per Customer
Lavatory Faucet	0.5	gal/min	0.25	min	0.5	0	0.4	gal/min	0
Urinals	1	gal/flush	1	flush	0.4	0	0.5	gal/flush	0
Toilet (Water Closet)	1.6	gal/flush	1	flush	0.6	1	1.28	gal/flush	1
						1			1
					GPD per 1000 GSF =	137		GPD per 1000 GSF =	98
					(10 GSF/customer)			(10 GSF/customer)	
<b>2. Employee</b>									
Type	Baseline Rate <sup>(a)</sup>	Unit	No. of Units <sup>(b)</sup>	Unit	Ave Daily Use <sup>(b)</sup>	GPD per Employee	Rate (w/ Code) <sup>(a)</sup>	Unit	GPD per Employee
Lavatory Faucet	0.5	gal/min	0.25	min	3	0	0.4	gal/min	0
Urinals	1	gal/flush	1	flush	2	2	0.5	gal/flush	1
Toilet (Water Closet)	1.6	gal/flush	1	flush	4	6	1.28	gal/flush	5
						9			6
					GPD per 1000 GSF =	35		GPD per 1000 GSF =	26
					(250 GSF/Employee)			(250 GSF/Employee)	
					Total GPD per 1000 GSF =	172		Total GPD per 1000 GSF =	124
Notes:									
(a) Baseline flow rate for Lavatory faucet, toilet and urinals are taken from 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 1).									
(b) Duration and Average daily use of fixture flow rates are taken from 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 2). Average daily use of "Visitor" was used for customers instead of "Retail Customer" uses from WE Table 2 as it seemed more reasonable.									
(c) Flow rate based on maximum flow rate prescribed by 2011 SF Green Building Requirements (Table 13C.5.303.2.3).									

**Notes:**

(a) Baseline flow rate for Lavatory faucet, toilet and urinals are taken from 2009 LEED Reference Guide For Green Building Design and Construction(WE Table 1).

(b) Duration and Average daily use of fixture flow rates are taken from 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 2). Average daily use of "Visitor" was used for customers instead of "Retail Customer" uses from WE Table 2 as it seemed more reasonable.

(c) Flow rate based on maximum flow rate prescribed by 2011 SF Green Building Requirements (Table 13C.5.303.2.3).





**Table 10 - SWL 330 Water Demand by Project Component**
**Baseline Water Demand**

Project Component	GSF	No. of Units	Unit	Unit Rate (gal/day/unit)	Water Use (gal/day)	MGD
1. Residential	208,844	176	Dwelling	112	19,745	0.020
2. Hotel	178,406	227	Room	128	29,025	0.029
3. Retail	22,017	22	1000 Sq.Ft.	86	1,897	0.002
4. Restaurant	7,837	8	1000 Sq.Ft.	339	2,655	0.003
5. Landscape (terrace & green roof)	15,000	15	1000 Sq.Ft.	54	814	0.001
6. Pool & Spa	1,225				888	0.001
7. Washdown (parking & other outdoor hardscape areas)					196	0.000
<b>Total =</b>					<b>55,221</b>	<b>0.055</b>

**Adjusted Water Demand (for code)**

Project Component	GSF	No. of Units	Unit	Unit Rate (gal/day/unit)	Water Use (gal/day)	MGD
1. Residential	208,844	176	Dwelling	89	15,629	0.016
2. Hotel	178,406	227	Room	112	25,415	0.025
3. Retail	22,017	22	1000 Sq.Ft.	62	1,368	0.001
4. Restaurant	7,837	8	1000 Sq.Ft.	339	2,655	0.003
5. Landscape (terrace & green roof)	15,000	15	1000 Sq.Ft.	54	814	0.001
6. Pool & Spa	1,225				888	0.001
7. Washdown (parking & other outdoor hardscape areas)					196	0.000
<b>Total =</b>					<b>46,965</b>	<b>0.047</b>

**Table 11 - SWL 330 Water Consumption By End-Use (Baseline and Adjusted)**

<b>Residential End Uses</b>	<b>Baseline</b>						<b>Adjusted for Code</b>		
<b>1. Residents</b>									
Type	Baseline Rate <sup>(a)(b)</sup>	Unit	No. of Units <sup>(c)</sup>	Unit	Ave Daily Use <sup>(e)</sup>	GPD per Resident	Rate (w/ Code) <sup>(e)</sup>	Unit	GPD per Resident
Showhead	2.5	gal/min	8.2	min	0.65	13	2	gal/min	11
Bathroom Faucet	2.2	gal/min	1.5	min	1	3	1.5	gal/min	2
Bath	25	gal/bath	1	bath	0.1	3	25	gal/bath	3
Washing Machine	36.4	gal/load	1	cycle	0.31	11	26	gal/load	8
Toilet (Water Closet)	1.6	gal/flush	1	flush	4.75	8	1.28	gal/flush	6
Kitchen Faucet	2.2	gal/min	7.82	min	1	17	1.8	gal/min	14
Dishwasher	11.15	gal/cycle	1	cycle	0.04	0	11.15	gal/cycle	0
					GPD per Resident =	56		GPD per Resident =	44
					GPD per DU =	111		GPD per DU =	88
					(2 Residents/DU)			(2 Residents/DU)	
<b>2. Employees</b>									
Type	Baseline Rate <sup>(a)</sup>	Unit	No. of Units <sup>(d)</sup>	Unit	Ave Daily Use <sup>(d)</sup>	GPD per Employee	Rate (w/ Code) <sup>(e)</sup>	Unit	GPD per Employee
Showhead	2.5	gal/min	5	min	0.3	4	2	gal/min	3
Lavatory Faucet	0.5	gal/min	0.25	min	3	0	0.4	gal/min	0
Urinals	1	gal/flush	1	flush	2	2	0.5	gal/flush	1
Toilet (Water Closet)	1.6	gal/flush	1	flush	4	6	1.28	gal/flush	5
Kitchen Faucet	2.2	gal/min	0.25	min	1	1	1.8	gal/min	0
					GPD per Employee =	13		GPD per Employee =	10
					GPD per DU =	1		GPD per DU =	1
					(15 DUs/Employee)			(15 DUs/Employee)	
					Total GPD per Dwelling Unit =	112		Total GPD per Dwelling Unit =	89
Notes:									
(a) Baseline flow rate for showerhead, bathroom faucet, toilet, urinals and kitchen faucet are taken from 2009 LEED Reference Guide For Green Building Design and Construction(WE Table 1). Flow rate for bathtub is taken from SFPUC 2010 Urban Water Management Plan (UWMP) Retail Demand Model for New Multi-Family Residential Water Use. The flow rate is provide in the "Non-Potable Water Calculator" developed by SFPUC.									
(b) Flow rate for washing machine and dishwasher are taken from 2010 UWMP Conservation Model.									
(c) Duration and Average daily use of fixture flow rates are taken from the 2010 UWMP Retail Demand Model for New Multi-Family Residential Water Use.									
(d) Duration and Average daily use of fixture flow rates are taken from 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 2). Average daily showerhead use is increased from 0.1 to 0.3.									
(e) Flow rate based on maximum flow rate prescribed by 2011 SF Green Building Requirements (Table 13C.5.303.2.3). Flow rate for bathroom faucet is taken from 2009 LEED Water Efficiency Table 1.									



**Table 11 - SWL 330 Water Consumption By End-Use (Baseline and Adjusted)**

Table 11 - SWL 330 Water Consumption By End-Use (Baseline and Adjusted)									
Hotel End Uses									
1. Guests									
Type	Baseline Rate <sup>(a)(b)</sup>	Unit	No. of Units <sup>(b)(c)</sup>	Unit	Ave Daily Use <sup>(c)</sup>	GPD per Guest	Rate (w/ Code) <sup>(a)</sup>	Unit	GPD per Guest
Showerhead	2.5	gal/min	8.2	min	1	21	2	gal/min	16
Bathroom Faucet	2.2	gal/min	1.5	min	1	3	1.5	gal/min	2
Toilet (Water Closet)	1.6	gal/flush	1	flush	4.75	8	1.28	gal/flush	6
Icemakers	0.5	gal/meal	2.2	meal	1	1	0.5	gal/meal	1
Misc						0			0
					GPD per Guest =	33			GPD per Guest = 26
					GPD per Room =	66			GPD per Room = 52
					(2 Guests/Room)				(2 Guests/Room)
2. Employees									
Type	Baseline Rate <sup>(a)</sup>	Unit	No. of Units <sup>(d)</sup>	Unit	Ave Daily Use <sup>(d)</sup>	GPD per Employee	Rate (w/ Code) <sup>(a)</sup>	Unit	GPD per Employee
Showerhead	2.5	gal/min	5	min	0.3	4	2	gal/min	3
Lavatory Faucet	0.5	gal/min	0.25	min	3	0	0.4	gal/min	0
Urinals	1	gal/flush	1	flush	2	2	0.5	gal/flush	1
Toilet (Water Closet)	1.6	gal/flush	1	flush	4	6	1.28	gal/flush	5
Kitchen Faucet	2.2	gal/min	0.25	min	1	1	1.8	gal/min	0
					GPD per Employee =	13			GPD per Employee = 10
					GPD per Room =	10			GPD per Room = 8
					(1.25 Rooms/Employee)				(1.25 Rooms/Employee)
3. Laundry per Room <sup>(f)</sup>									
	4	gal/pound	8	pound	1	32	4	gal/pound	32
4. HVAC/Cooling Demand <sup>(g)</sup>									
	0.0196	gal/sf	786	sf	1	15	0.0196	gal/sf	15
5. Misc (cleaning, sanitization, etc)									
						5			5
					<b>Total GPD Per Room =</b>	<b>128</b>			<b>Total GPD Per Room = 112</b>
Notes:									
(a) Baseline flow rate for showerhead, bathroom faucet, toilet, urinals and kitchen faucet are taken from 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 1).									
(b) Gallons of water used by icemakers per meal per capita is taken from Waste Not, Want Not: The Potential for Urban Water Conservation in California, November 2003 (Appendix E Table E5).									
(c) Duration and Average daily use are assumed to be similar to Multi-Family Residential Water Use. Average use of showerhead is increased from 0.65 for residential users to 1 for guests.									
(d) Duration and Average daily use of fixture flow rates are taken from 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 2). Average daily showerhead use is increased from 0.1 to 0.3.									
(e) Flow rate based on maximum flow rate prescribed by 2011 SF Green Building Requirements (Table 13C.5.303.2.3). Flow rate for bathroom faucet is taken from 2009 LEED Water Efficiency Table 1.									
(f) Gallons of water used by laundry per room is taken from Waste Not, Want Not: The Potential for Urban Water Conservation in California, November 2003 (Appendix E Table E5).									
(g) Water demand for cooling is taken from SFPUC Potable Offset Investigation, April 2012. Water required is the average for 12-months.									
Retail End Uses									
1. Customer									
Type	Baseline Rate <sup>(a)</sup>	Unit	No. of Units <sup>(b)</sup>	Unit	Ave Daily Use <sup>(b)</sup>	GPD per Customer	Rate (w/ Code) <sup>(c)</sup>	Unit	GPD per Customer
Lavatory Faucet	0.5	gal/min	0.25	min	0.5	0	0.4	gal/min	0
Urinals	1	gal/flush	1	flush	0.4	0	0.5	gal/flush	0
Toilet (Water Closet)	1.6	gal/flush	1	flush	0.6	1	1.28	gal/flush	1
					GPD per Customer =	1			GPD per Customer = 1
					GPD per 1000 GSF =	57			GPD per 1000 GSF = 41
					(25 GSF/Customer)				(25 GSF/Customer)
2. Employee									
Type	Baseline Rate <sup>(a)</sup>	Unit	No. of Units <sup>(b)</sup>	Unit	Ave Daily Use <sup>(b)</sup>	GPD per Employee	Rate (w/ Code) <sup>(c)</sup>	Unit	GPD per Employee
Lavatory Faucet	0.5	gal/min	0.25	min	3	0	0.4	gal/min	0
Urinals	1	gal/flush	1	flush	2	2	0.5	gal/flush	1
Toilet (Water Closet)	1.6	gal/flush	1	flush	4	6	1.28	gal/flush	5
					GPD per Employee =	9			GPD per Employee = 6
					GPD per 1000 GSF =	29			GPD per 1000 GSF = 21
					(300 GSF/Employee)				(300 GSF/Employee)
					<b>Total GPD per 1000 GSF =</b>	<b>86</b>			<b>Total GPD per 1000 GSF = 62</b>

**Table 11 - SWL 330 Water Consumption By End-Use (Baseline and Adjusted)**

Notes:

(a) Baseline flow rate for Lavatory faucet, toilet and urinals are taken from 2009 LEED Reference Guide For Green Building Design and Construction(WE Table 1).

(b) Duration and Average daily use of fixture flow rates are taken from 2009 LEED Reference Guide For Green Building Design and Construction (WE Table 2). Average daily use of "Visitor" was used for customers instead of "Retail Customer" uses from WE Table 2 as they seemed more reasonable.

(c) Flow rate based on maximum flow rate prescribed by 2011 SF Green Building Requirements (Table 13C.5.303.2.3)

Resturant		Baseline					Adjusted for Code		
Type	Baseline Rate <sup>(a)</sup>	Unit	No. of Units <sup>(b)</sup>	Unit	Ave Daily Use <sup>(c)</sup>	GPD per 1000 GSF	Rate (w/ Code)	Unit	GPD per 1000 GSF
Resturant	24.2	gal/seal	0.02	seats/sf	0.7	339	24.2	gal/seal	339
					GPD per 1000 GSF=	339			GPD per 1000 GSF= 339

Notes:

(a) Flow rate taken from Commercial and Institutional End Uses of Water report by American Water Works Association (Table 2.14)

(b) Assumed four seats in a 10ftX10ft area converging 50% of the GSF

(c) Assumed 70% of the restaurant is full.

Pool & Spa		Baseline					Adjusted for Code		
Type	Baseline Rate	Unit	No. of Units	Unit	Ave Daily Use	GPD	Rate (w/ Code)	Unit	GPD
Evaporation <sup>(a)</sup>	0.067	gal/sf	1,225	sf	1	82	0.067	gal/sf	82
Splash & Carry-off <sup>(b)(c)</sup>	2	gal/guest	454	guests	0.5	454	2	gal/guest	454
	2	gal/resident	352	residents	0.5	352	2	gal/resident	352
						<b>GPD =</b>		<b>GPD =</b>	
						<b>888</b>		<b>888</b>	

Notes:

(a) Evapotranspiration (ET<sub>o</sub>) is taken from SFPUC Non-Potable Water Calculator. ET<sub>o</sub> per year is provided as 39-inches/year or 24.3 gal/sf/year. Average ET<sub>o</sub> per day is 0.067 gpd/sf.

(b) Splash & Carry-off is taken from webpage @ [http://www.allianceforwaterefficiency.org/Health\\_Clubs\\_Introduction.aspx?terms=pool](http://www.allianceforwaterefficiency.org/Health_Clubs_Introduction.aspx?terms=pool) Splash & Carry-off is 2 gal/user Assumed 2 guests/room

(c) Assumed 50% of hotel guests and residents use pool and spa.

Washdown & Facility Cleaning						
Type	Flow Rate <sup>(a)</sup>	Unit	No. of Units <sup>(a)</sup>	Unit	Ave Yearly Use <sup>(b)</sup>	GPY per 1000 GSF
Outdoor Hardscape Washdown	5 gal/min		30	min/1000 sf	6	900
				Project Annual Water Use (gal) = (using hardscape area of 40,000 sf)		36,000
Parking Garage Washdown	5 gal/min		30	min/1000 sf	2	300
				Project Annual Water Use (gal) = (using parking GSF of 107,000 sf)		32,100
Misc Cleaning (assumed to be 5%)						3,405
				Total GPY =		71,505
				Total GPD =		196

**Notes:**

(a) Outdoor power wash flow rate and time required are based on information gathered from local vendors (Puma Power Wash, San Francisco & Clean 'n Seal, Brentwood, CA). A similar flow rate is also provided in the 2008 Watersmart Guidebook prepared by EBMUD. Outdoor hardscapes include hotel and residential access at street level and terrace hardscape areas.

(b) Outdoor hardscape area cleaning is assumed to be occur 6 times/year. General cleaning practice is 2 to 3 times/year based information provided by local vendors.