Appendix 4.13A Potrero HOPE SF Master Plan Draft EIR Water Demand and Wastewater Generation Discharge Memorandum. Prepared by Atkins. May 14, 2012.

MEMORANDUM

To: Rachel Schuett and Nannie Turrell

From: Atkins

Date: Monday, May 14, 2012

Subject: Potrero HOPE SF Master Plan Draft EIR Water Demand and Wastewater Discharge Memorandum

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In order to estimate water demand and wastewater discharge associated with the implementation of the Potrero HOPE SF Master Plan, water demand factors concomitant with the proposed land uses were taken from various San Francisco Bay Area planning documents. Sources for the water demand factors are the San Francisco Public Utilities Commission (SFPUC) 2010 Urban Water Management Plan (UWMP), the Treasure Island/Yerba Buena Island Redevelopment Project EIR, and the 300 Airport Boulevard Project EIR (City of Burlingame).

The 2010 UWMP was used to determine appropriate residential and retail water demand factors. The Potrero HOPE SF Master Plan would consist of multi-family housing units, commercial land uses, and a community center.

This memo includes water demand and wastewater discharge projections for Alternative 1, Proposed Action Alternative as well as Alternative 2, Reduced Development Alternative; Alternative 3, Housing Replacement Alternative; and Alternative 4, No Build Alternative.

ALTERNATIVE 1 – PROPOSED ACTION ALTERNATIVE

Residential Demand

To determine a multi-family residential water demand factor, the following calculations/assumptions were utilized:

- According to SFPUC 2010 UWMP, total citywide multi-family residential retail demand for 2010 was 29.2 million gallons per day (mgd);
- Total number of multi-family housing units citywide in 2010 was 239,999. The average number of residents per multi-family housing unit for 2010 was 2;
- Therefore, 29,200,000 gallons per day/239,999 housing units/2 persons per housing unit[1] = **60.8 gallons per person per day (gpcd).**[2]

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[1] SFPUC 2010 Urban Water Management Plan, Appendix D, Table 6: SFPUC Retail Demand Model Updated Multi Family Persons Per Household Projection. Page 9 of 49, April 21, 2011, website: http://sfwater.org/modules/showdocument.aspx?documentid=1054, accessed April 11, 2012.

Commercial Demand

- According to the 2010 UWMP Appendix D, the water demand rate for the retail sector is **53.9 gallons per employee day (GED).**

Community Center Demand

- According to the Treasure Island/Yerba Buena Island Redevelopment Project EIR, the demand factor for a Community Center land use is approximately **0.105 gpd per square foot (gpd/sf).**[3]

Open Space/Irrigation Demand

- According to the water demand analysis prepared by BKF Engineers for the recent 300 Airport Boulevard Project in the City of Burlingame, irrigation water demand is equal to **0.05 gpd/sf.**

Calculations

Alternative 1, Proposed Action. Table 1 presents the land uses that would be developed under the proposed action and their respective size and anticipated occupancy (where applicable).

TABLE 1
ALT 1 - PROPOSED ACTION SUMMARY TABLE

	Total	Residents/Employees
Total Housing Units	1,700	3,876
Retail/Flex Space	up to 15,000 sf	34[b]
Community	up to 35,000 sf	--
Open Space[a]	approximately 7 acres	--

Source: BRIDGE Housing, 2012.

Note:

a. Includes parks, plazas, stairs, hillsides, shared courtyards, and private yards.

b. Association of Bay Area Governments, 1987 Input-Output Model and Economic Multipliers for the San Francisco Bay Region, March 1995. Multiplier for "Retail Trade" requires 450 sf per employee. As such 15,000 sf of proposed retail/450 sf = ~34 employees.

Table 2 summarizes the proposed project's land uses, associated water demand factors, and total water demand for each land use.

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2 For comparison the Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR relied on a residential water demand rate of 62 gallons per day per capita based on the 2005 SFPUC UWMP average combined single-family and multi-family residential demand rate. According to the 2010 SFPUC UWMP, the combined single-family and multi-family residential water demand rate is 50 gallons per day per capita (see page 34 of the 2010 SFPUC UWMP).

3 This calculation used water demand from the Pier 1 Community Center, as identified in the Treasure Island/Yerba Buena Redevelopment Project EIR. Water demand = 3,675 gpd; Pier 1 Community Center = 35,000 sf; 3,675 gpd/35,000 sf = 0.105 gpd/sf

TABLE 2
ALT 1 - PROPOSED ACTION WATER DEMAND

Use	Total Use Area	Residents/Employees	Demand Factor	Water Demand (mgd)
Residential	1,700	3,876	60.8 gpcd	0.24
Retail/Flex Space	up to 15,000 sf	34[b]	53.9 ged	0.0018
Community	up to 35,000 sf	--	0.105 gpd/sf	0.0037
Open Space[a]	approximately 7 acres	--	0.05 gpd/sf	0.015
			TOTAL	**0.26**

Source: BRIDGE Housing, 2012.

Note:

a. Includes parks, plazas, stairs, hillsides, shared courtyards, and private yards.

b. Association of Bay Area Governments, 1987 Input-Output Model and Economic Multipliers for the San Francisco Bay Region, March 1995. Multiplier for "Retail Trade" requires 450 sf per employee. As such 15,000 sf of proposed retail/450 sf = ~34 employees.

Based on the summation of the individual water demand calculations presented in Table 2, the total water demand associated with the proposed project would be approximately **0.26 mgd or 95 million gallons per year (mgy).**

Wastewater Discharge

According to a response to data request from Betsey Eagon, SFPUC, approximately 90 percent of water supplied is discharged as wastewater into the sewer system. As such, the estimated wastewater discharge for Alternative 1, the Project Action Alternative is **0.234 mgd** (0.26 mgd *0.90 = 0.234 mgd). This equates to approximately **85 mgy** of wastewater discharge.

ALTERNATIVE 2 – REDUCED DEVELOPMENT ALTERNATIVE

The same water demand factors identified for Alternative 1, above, were used to determine residential, commercial, community center, and irrigation demand for Alternative 2.

Calculations

Alternative 2, Reduced Development Alternative. Table 3 presents the land uses that would be developed under the Reduced Development Alternative and their respective size and anticipated occupancy (where applicable).

TABLE 3
ALT 2 - REDUCED DEVELOPMENT ALTERNATIVE SUMMARY TABLE

	Total	Residents/Employees
Total Housing Units	1,280	2,918
Retail/Flex Space	up to 15,000 sq ft	34[b]
Community	up to 25,000 sq ft	--
Open Space[a]	approximately 7 acres	--

Source: BRIDGE Housing, 2010.

Notes:

a. Includes parks, plazas, stairs, hillsides, shared courtyards, and private yards.

b. Association of Bay Area Governments, 1987 Input-Output Model and Economic Multipliers for the San Francisco Bay Region, March 1995. Multiplier for "Retail Trade" requires 450 sf per employee. As such 20,000 sf of proposed retail/450 sf = ~34 employees.

Table 4 summarizes the Reduced Development Alternative's land uses, associated water demand factors, and total water demand for each land use.

TABLE 4
ALT 2 - REDUCED DEVELOPMENT ALTERNATIVE WATER DEMAND

Use	Total Use Area	Residents/Employees	Demand Factor	Water Demand (mgd)
Residential	1,280	2,918	60.8 gpcd	0.177
Retail/Flex Space	up to 15,000 sq ft	34[b]	53.9 ged	0.0018
Community	up to 25,000 sq ft	--	0.105 gpd/sf	0.0026
Open Space[a]	approximately 7 acres	--	0.05 gpd/sf	0.015

Source: BRIDGE Housing, 2012.

Note:

a. Includes parks, plazas, stairs, hillsides, shared courtyards, and private yards.

b. Association of Bay Area Governments, 1987 Input-Output Model and Economic Multipliers for the San Francisco Bay Region, March 1995. Multiplier for "Retail Trade" requires 450 sf per employee. As such 15,000 sf of proposed retail/450 sf = ~34 employees.

As shown in Table 4, above, the total water demand associated with the Reduced Density Alternative would be approximately **0.2 mgd** or **73 mgy.**

Wastewater Discharge

Using the same methodology as described for Alternative 1, the estimated wastewater discharge for Alternative 2 is **0.18 mgd** (0.2 mgd*0.90 = 0.18 mgd). This equates to approximately **65.7 mgy** of wastewater discharge.

ALTERNATIVE 3 – HOUSING REPLACEMENT ALTERNATIVE

Alternative 3 would replace the existing onsite structures in kind. No additional housing units would be constructed and the existing number of residents would not change. Under this alternative, there would be no change in water demand or wastewater discharge.

ALTERNATIVE 4 – NO BUILD ALTERNATIVE

Under this alternative the existing structures and tenants on the project site would remain and no new buildings or uses would be constructed. Therefore, the water demand and wastewater discharge would not change.

Appendix 4.13B Paula Kehoe, Director of Water Resources, San Francisco Public Utilities Commission, Letter to Bill Wycko RE: Water Supply Assessment for the Proposed Potrero HOPE SF Project, July 6, 2011.

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July 6, 2011

Bill Wycko
San Francisco Planning Department
1650 Mission Street, Suite 400
San Francisco, CA 94 103-2479

RE: Water Supply Assessment for the Proposed Potrero HOPE SF Project

Dear Mr. Wycko,

I am writing in response to your request for an assessment of adequate water supply for the Proposed Potrero HOPE SF Project, a partnership between the Mayor's Office of Housing and the San Francisco Housing Authority (SFHA). The project proposes to redevelop the Potrero Terrace and the Potrero Annex housing projects as part of a program to revitalize distressed public housing developments in San Francisco. The project site currently contains 606 public housing units. The project proposes to demolish and replace these units one-for-one and construct up to 1,700 residential units (including the 606) for a variety of income levels. The proposed project would also include: up to 30,000 square feet (sf) of retail/flex space, up to 50,000 sf of community space, and approximately seven acres of open space including parks, plazas, stairs, hillsides, shared courtyards, and private yards, as well as new vehicle connections, new pedestrian connections, a new circulation concept, and new transit stops. In addition, the proposed project would incorporate green construction and sustainable principles.

As required by amendments to the California Environmental Quality Act (CEQA) (Public Resources Code sections 21000 et. seq.) and the California Water Code (sections 10620-106031 and sections 10855-10912) "public water systems" such as the San Francisco Public Utilities Commission (SFPUC), and cities and counties approving certain development projects under CEQA, in this case the San Francisco Planning Department (City Planning), must conduct a water supply assessment for large development projects[1] and include such assessment in environmental review documents prepared for the project. The Water Code further requires the governing body of the public water supplier to approve a water supply assessment for each qualifying development at a regular or special meeting. Alternatively, Water Code section 10910 allows the public water supplier's most recent Urban Water Management Plan to fulfill the water supply assessment requirement if the Urban Water Management Plan accounted

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Anson Moran
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[1] Projects covered by the new provisions include (1) proposed residential development of more than 500 dwelling units; (2) proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space; (3) proposed commercial office building employing more than 1;000 persons or having more than 250,000 square feet; (4) proposed hotel or motel, or both, having more than 500 rooms; (5) proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area; (6) mixed use project than includes one or more of the projects specified in this subdivision; 7) project that would demand an amount of water equivalent to or greater than, the amount of water required by a 500 dwelling unit project

for the projected water demand associated with the proposed development subject to the water supply assessment.

The SFPUC adopted the 2010 Urban Water Management Plan (UWMP) for the City and County of San Francisco on June 14, 2011. The 2010 UWMP was prepared in accordance with the Urban Water Management Planning Act of 1983, as amended through 2010. The 2010 UWMP provides water demand projections for the City and County of San Francisco through the year 2035. These projections are based on ABAG Projections 2009 and ABAG Sustainable Communities Strategy Baseline Update 2010, which provide projected growth for the City through the year 2035. ABAG projections were then reviewed and refined by City and County of San Francisco Planning using up-to-date planning information for the City. City Planning staff have attested that the ABAG projections have taken into account all known and expected future development in the City.

In coordination with the adoption of the 2010 UWMP, the SFPUC also adopted a resolution affirming that future development in the City and County of San Francisco had been incorporated into the Urban Water Management Plan's water demand projections. This resolution will serve as the required water supply and demand assessment for qualifying development projects in San Francisco between now and 2015, when the SFPUC is required to update the Urban Water Management Plan. In the event that the projected water demand for a future qualifying development project is not included in the 2010 UWMP, the SFPUC will work with the Planning Department to prepare an individual water supply and demand assessment as required by the Water Code for future Commission approval.

The Planning Department has confirmed the proposed project was included in the growth projections used in the 2010 UWMP. As such, the SFPUC has included the water demands associated with the proposed project in future water demands for the City and County of San Francisco. The 2010 UWMP provides plans to meet the City and County of San Francisco's future water demands through 2035. The proposed project will not result in major expansion of the water utility system.

Please fee free to contact Molly Petrick with any further questions or concerns at (415) 934-5767 or mpetrick@sfwater.org

Sincerely,

Paula Kehoe
Director of Water Resources, SFPUC

Cc: Rachel Schuett, Planning Department

Appendix 4.13C SFPUC Water Supply Assessment for the Potrero HOPE SF Master Plan. June 17, 2013.

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June 17, 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 Potrero HOPE SF Master Plan

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 Potrero HOPE SF Master Plan, 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. 2010.0515, San Francisco Planning Department).

1.1.1 <u>The SFPUC's 2010 UWMP and 2013 Water Availability Study</u>

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.***

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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 more than 500 residential dwelling units. 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

As part of the HOPE SF Program, a partnership between the Mayor's Office of Housing and the San Francisco Housing Authority, BRIDGE Housing Corporation proposes a primarily residential mixed-use project that would include up to 1,700 multifamily housing units and about 7 acres of open space. The proposed project would be developed on an approximately 39-acre site located in the Potrero Hill neighborhood about one and one-half blocks west of I-280 and four blocks east of U.S. 101. The site is roughly bounded by 22nd Street and the Potrero Hill Recreation Center and adjacent properties to the north; Texas Street to the east; 26th Street to the south; and Wisconsin Street to the west. The project site consists of several parcels and is currently developed with 606 units of multifamily public housing with associated internal roadways and surface parking lots. All of the existing buildings would be demolished and the street pattern would be reconfigured as part of the project, resulting in about 13.2 acres of paved streets. In addition, the proposed project would include up to 1,000 vehicle parking spaces in garages and up to 640 on-street parking spaces, along with approximately 415 bicycle parking spaces throughout the site.

Construction of the proposed project is expected to occur in three phases between 2015 and 2025 or later. Phase 1 would be occupied by 2020, Phase 2 would be occupied by 2025, and Phase 3 would be occupied after 2025. Upon completion of all three phases, the project would have up to approximately 3,876 residents; currently, there are about 1,200 residents on site.

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
Annual Average	**63.3**	**50.6**	**22.45**

Source: Western Regional Climate Center (www.wrcc.dri.edu), 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

BRIDGE Housing's CEQA consultants for the proposed project 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 BRIDGE Housing'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[1]

	2015	2020	2025	2030	2035
Total Demand of Proposed Project (mgd)	-	0.06	0.19	0.26	0.26

mgd = million gallons per day

Note:
1. Construction of the proposed project is expected in occur in three phases between 2015 and 2025 or later. Assumptions regarding phasing and occupancy are described in the Project Demand Memo cover letter from the San Francisco Planning Department (Attachment C).

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)[1]	83.7	83.4	82.4	82.5	84.2
Proposed Project Demand (mgd)	-	0.06	0.19	0.26	0.26
Portion of Total Retail Demand[2]	-	0.07%	0.23%	0.32%	0.31%

mgd = million gallons per day

Notes:
1. Retail water demands per ***Table 6 of the Water Availability Study***.
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 a range of 0.07 to 0.32 percent of the total In-City retail water demand between 2020 and 2035.

Table 4: Projected Supply and Demand Comparison (mgd)

		Normal Year[1,2]	Single Dry Year[1,2]	Multiple Dry Years		
				Year 1[1,2]	Year 2[2,3]	Year 3[2,3]
2015	Total Retail Demand	83.7	83.7	83.7	83.7	83.7
	Total Retail Supply – Existing Supplies Only[4]	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[4]	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit)[5]	(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[4]	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[4]	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[4]	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[4]	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[4]	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[4]	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[4]	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit)[6]	(0.7)	(0.7)	(0.7)	(2.2)	(2.2)
	Total Retail Supply – Existing & Future Supplies[4]	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 percent, 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 with occupancy of Phase 1 in 2020, 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@sfwater.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).[1]

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.

[1] 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[2]

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.[3]

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[2] For more detailed information on the RWS, see Section 2.1 of the SFPUC's 2010 UWMP.

[3] 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.

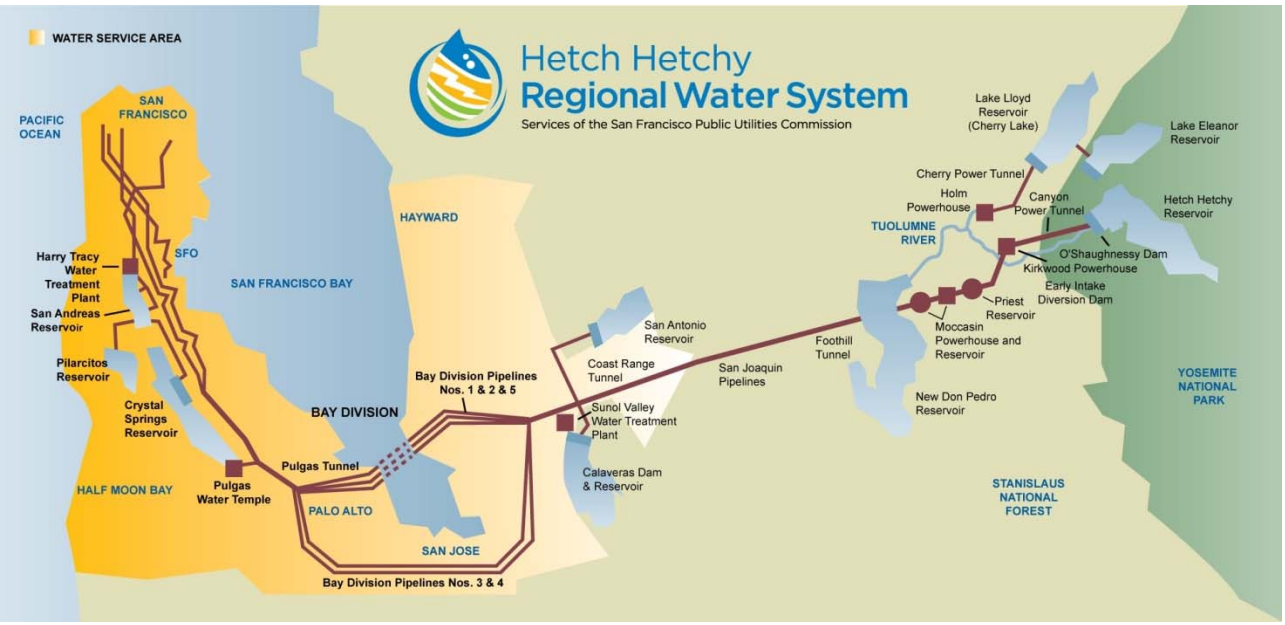

Figure 1: SFPUC Regional Water System

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.[4]

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.

[4] 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.[5]
- 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:[6]

- 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[7]

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

[5] This 20% rationing level applies to retail and wholesale customers combined. No rationing level is specified for retail customers only.

[6] 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.

[7] 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.[8]

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).[9] 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.[10] The WSAP Tier 1 Plan allocates the available water supply between retail and wholesale customers as follows.

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[8] See Section 4.06 of the wholesale Water Supply Agreement.

[9] Refer to the 2010 Urban Water Management Plan Appendix G for full text of the WSAP.

[10] 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[1]		Single Dry Year[1]		Multiple Dry Years[1,2]					
				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

Notes:
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.[11] 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.

[11] 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[12]

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

[12] 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 20th 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[13]

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

[13] 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.

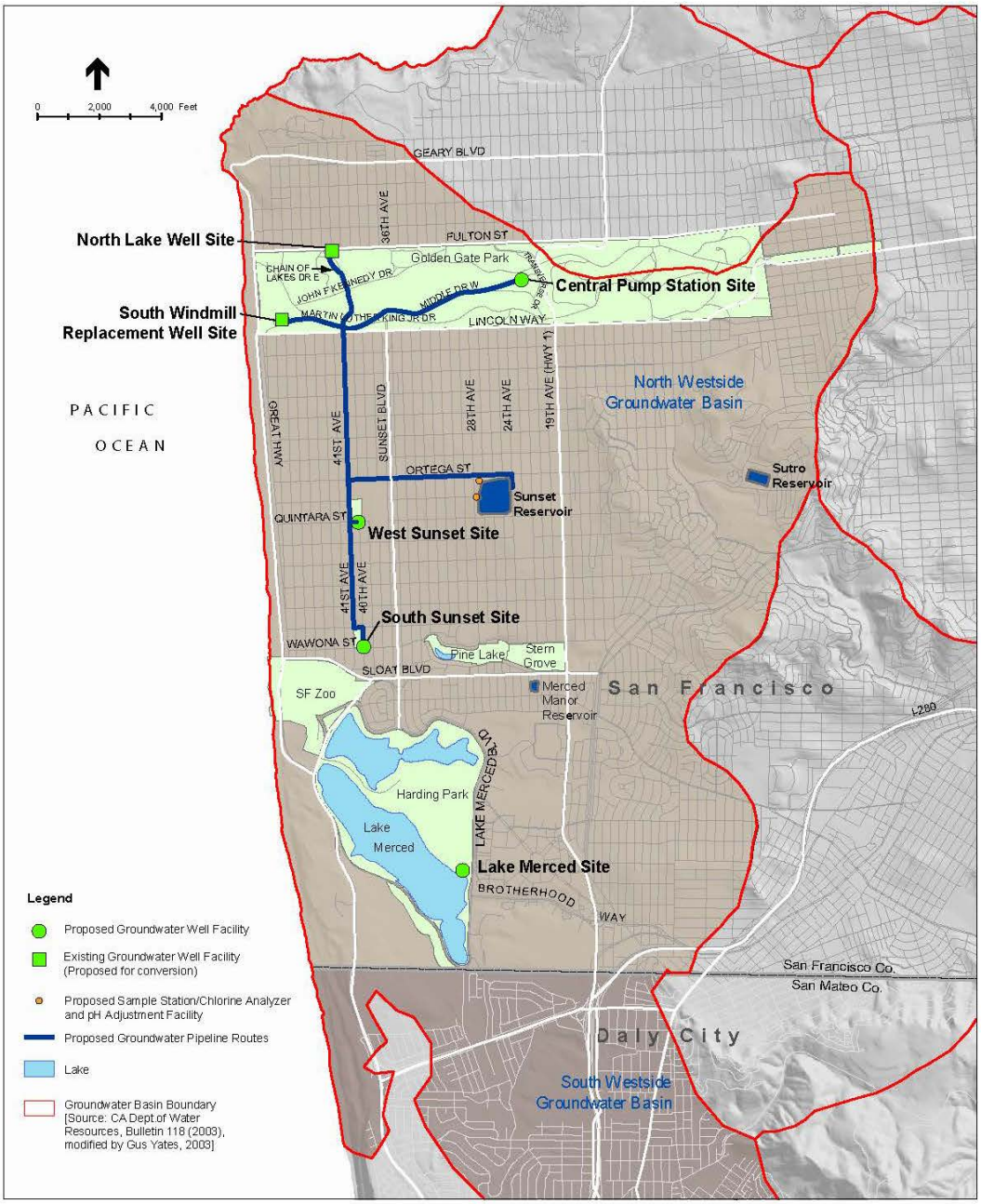

Figure 2: San Francisco Groundwater Supply Project

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.

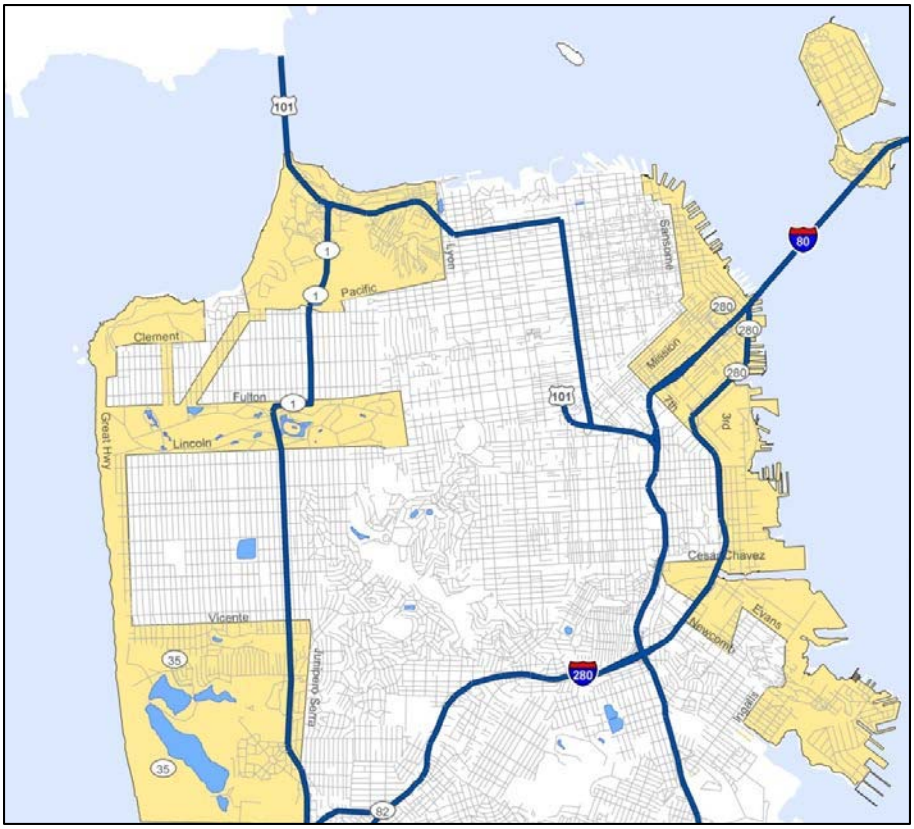

Figure 3: San Francisco's Designated Recycled Water Use Areas

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
Existing Supply Sources					
RWS Watersheds - Retail Allocation	81.0	81.0	81.0	81.0	81.0
Suburban Groundwater & Subsurface Diversions[1]	0.7	0.7	0.7	0.7	0.7
North Westside Groundwater Basin[2]	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
Existing Supplies Subtotal	**83.5**	**83.5**	**83.5**	**83.5**	**83.5**
Future Supply Sources[3]					
Future North Westside Groundwater Basin Expansion[2]	0.0	2.8	2.8	2.8	2.8
Future Recycled Water Projects	0.0	2.0	4.0	4.0	4.0
Future Supplies Subtotal	**0.0**	**4.8**	**6.8**	**6.8**	**6.8**
TOTAL PROJECTED SUPPLIES	**83.5**	**88.3**	**90.3**	**90.3**	**90.3**

Notes:

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.
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.
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.)

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[14], 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
Existing Supply Sources					
RWS Watersheds - Retail Allocation	79.5	79.5	79.5	79.5	79.5
Groundwater & Subsurface Diversions[1]	0.7	0.7	0.7	0.7	0.7
North Westside Groundwater Basin[2]	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
Existing Supplies Subtotal	**82.0**	**82.0**	**82.0**	**82.0**	**82.0**
Future Supply Sources[3]					
Future North Westside Groundwater Basin Expansion[2]	0.0	2.8	2.8	2.8	2.8
Future Recycled Water Projects	0.0	2.0	4.0	4.0	4.0
Future Supplies Subtotal	**0.0**	**4.8**	**6.8**	**6.8**	**6.8**
TOTAL PROJECTED MULTIPLE DRY-YEAR SUPPLIES	**82.0**	**86.8**	**88.8**	**88.8**	**88.8**

Notes:
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.
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.
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.

[14] 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
Housing Units Projections					
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
Net Change	**(1,761)**	**1,575**	**4,167**	**6,935**	**11,235**
Employment Projections					
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
Net Change	**52,002**	**78,471**	**59,552**	**41,818**	**35,068**

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[1]	2015	2020	2025	2030	2035
In-City Retail Customers						
Single-Family Residential[2]	16.1	16.7	15.5	14.8	14.4	14.3
Multi-Family Residential[2]	24.9	28.1	27.7	27.6	27.9	28.6
Non-Residential[2]	23.2	26.5	27.7	27.5	27.7	28.7
Other In-City Demands[4,7]	0.2	0.2	0.2	0.2	0.2	0.2
In-City Irrigation Uses[5,7]	1.5	1.5	1.5	1.5	1.5	1.5
Losses[2,3]	6.9	5.1	5.2	5.2	5.2	5.3
In-City Retail Subtotal	**72.8**	**78.1**	**77.8**	**76.8**	**76.9**	**78.6**
Suburban Retail Customers						
Single-Family Residential[7]	0.1	0.1	0.1	0.1	0.1	0.1
Non-Residential[7]	3.7	4.3	4.3	4.3	4.3	4.3
Hetch Hetchy Water & Power Customers[6,7]	1.2	1.2	1.2	1.2	1.2	1.2
Suburban Retail Subtotal	**5.0**	**5.6**	**5.6**	**5.6**	**5.6**	**5.6**
Total Retail Demand	**77.8**	**83.7**	**83.4**	**82.4**	**82.5**	**84.2**

Notes:

1. 2012 data are based on actual billing data.
2. 2015-2035 projections were generated using the SFPUC Retail Demand Model and include savings from passive and active conservation.
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.
4. Builders and Contractors, Docks and Ships.
5. Irrigation at Golden Gate Park, the Great Highway, and the San Francisco Zoo.
6. Hetch Hetchy Water & Power Customers include Lawrence Livermore National Laboratory, Groveland Community Services District and other incidental uses.
7. 2015-2035 projections are based on average historic consumption, which has remained relatively constant over the past 20 years.

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).

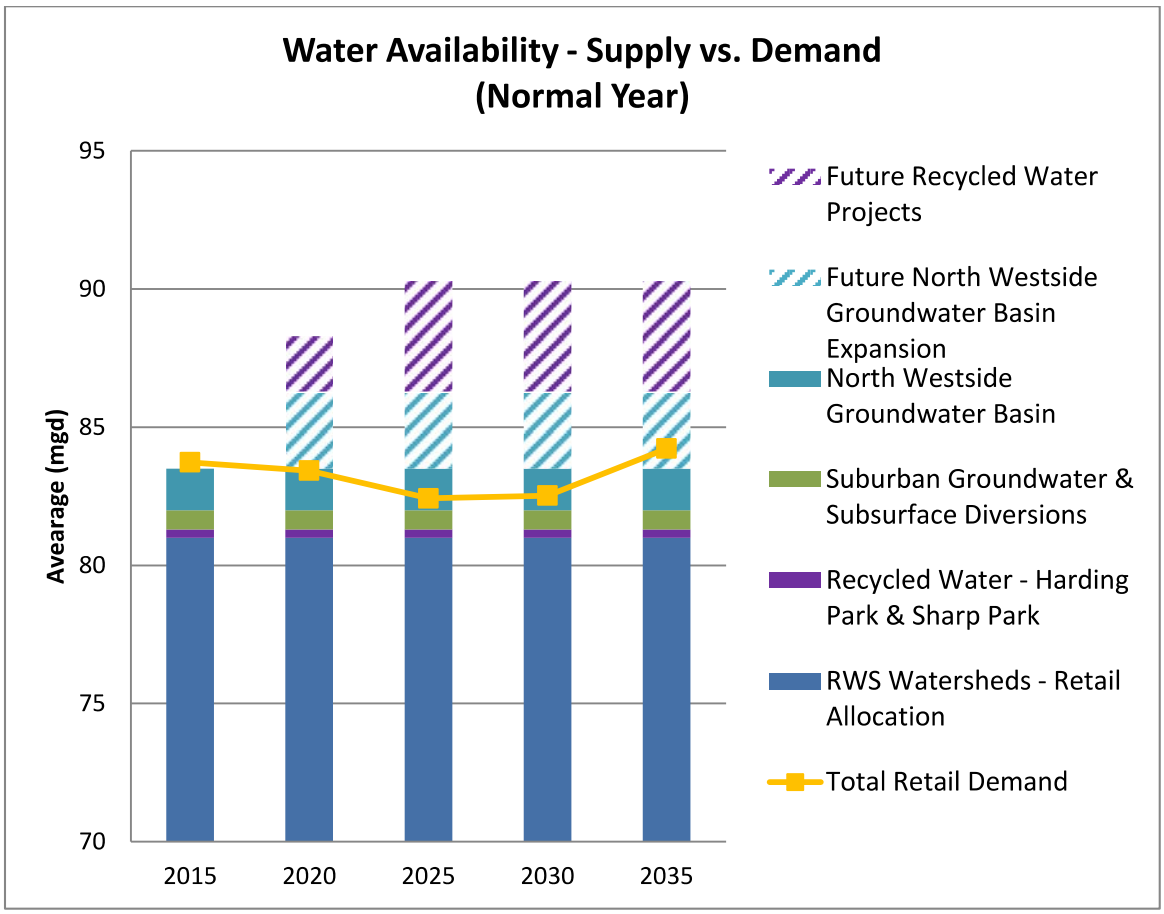

Figure 4: Normal-Year Supply and Demand Comparison

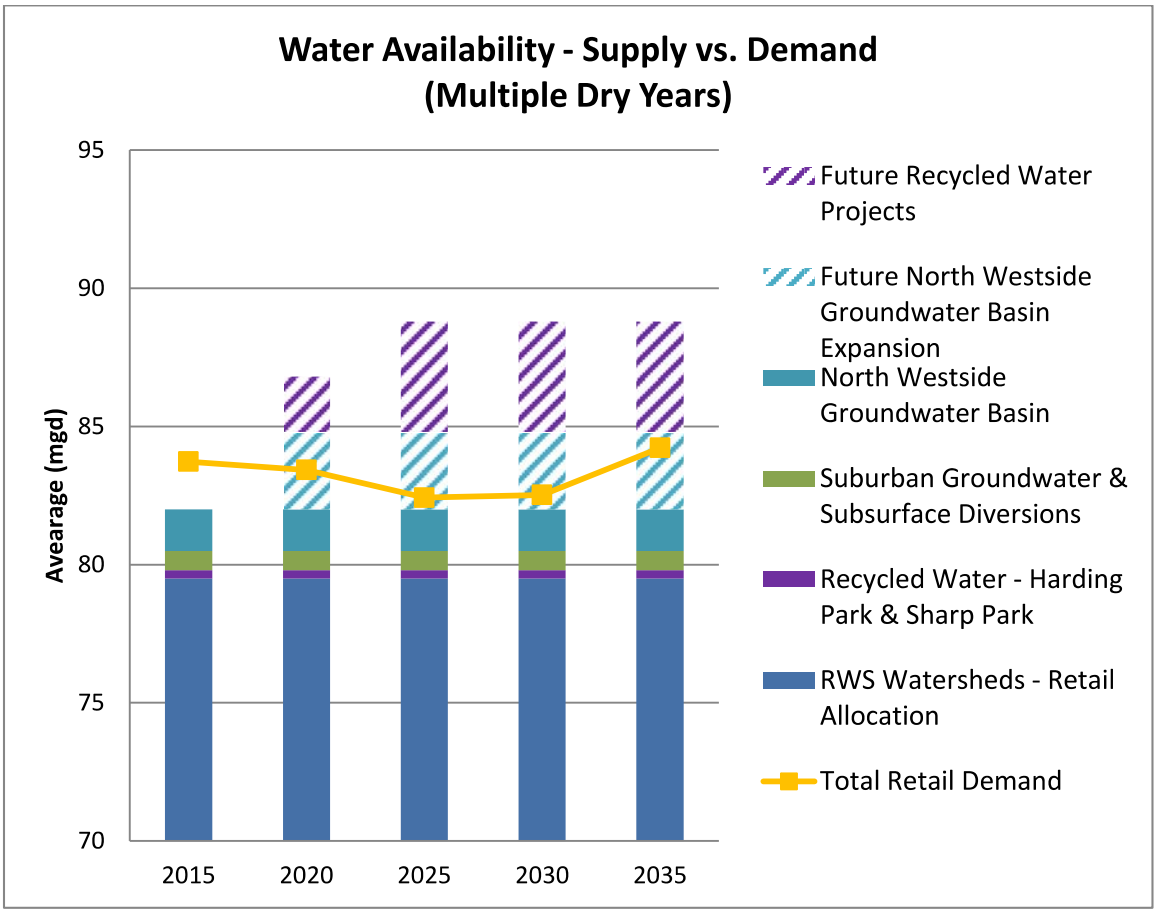

Figure 5: Multiple Dry-Year Supply and Demand Comparison

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[1,2]	Single Dry Year[1,2]	Multiple Dry Years		
				Year 1[1,2]	Year 2[2,3]	Year 3[2,3]
2015	Total Retail Demand	83.7	83.7	83.7	83.7	83.7
	Total Retail Supply – Existing Supplies Only[4]	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[4]	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit)[5]	(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[4]	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[4]	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[4]	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[4]	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[4]	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[4]	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[4]	83.5	83.5	83.5	82.0	82.0
	Surplus/(Deficit)[6]	(0.7)	(0.7)	(0.7)	(2.2)	(2.2)
	Total Retail Supply – Existing & Future Supplies[4]	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

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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) or telephone (415-575-6818).

Sincerely,

John Rahaim
Director of Planning

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

Appendix B - SFPUC Memorandum

San Francisco Water Power Sewer
Services of the San Francisco Public Utilities Commission

525 Golden Gate Avenue, 13th Floor
San Francisco, CA 94102
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MEMO

February 22, 2013

To: Steve Ritchie, Assistant General Manager, Water Enterprise

From: Paula Kehoe, Water Resources Director

Re: Updates to 2011 Retail Conservation Plan

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)

Single Family In-City Retail Demand (mgd)	2005	2010	2015	2020	2025	2030	2035
Basline Demand without Codes or SFPUC Conservation Programs	**19.6**	**20.3**	**20.4**	**20.5**	**20.5**	**20.6**	**20.9**
Less Savings from Codes	*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**
Less Savings from 2005-30 SFPUC Conservation Programs	*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**
Savings from Codes & SFPUC Conservation Programs	***0.9***	***2.2***	***3.7***	***4.9***	***5.8***	***6.3***	***6.5***
Multi Family In-City Retail Demand (mgd)	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Basline Demand without Codes or SFPUC Conservation Programs	**29.8**	**32.1**	**33.0**	**34.7**	**36.2**	**37.9**	**39.7**
Less Savings from Codes	*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**
Less Savings from 2005-30 SFPUC Conservation Programs	*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**
Savings from Codes & SFPUC Conservation Programs	***1.3***	***2.9***	***4.9***	***7.0***	***8.6***	***10.0***	***11.2***
Non Residential In-City Retail Demand (mgd)	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Basline Demand without Codes or SFPUC Conservation Programs	**25.7**	**25.2**	**28.9**	**31.4**	**32.0**	**32.8**	**33.9**
Less Savings from Codes	*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**
Less Savings from 2005-30 SFPUC Conservation Programs	*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**
Savings from Codes & SFPUC Conservation Programs	***0.1***	***1.0***	***2.5***	***3.7***	***4.5***	***5.1***	***5.2***
Other (mgd)	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Builders & Contractors, Docks & Shipping	0.2	0.2	0.2	0.2	0.2	0.2	0.2
System Losses Excluding Meter Under-Registration (mgd)[1]	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Calculated as % of Adjusted Baseline Demand	5.0	5.0	5.1	5.2	5.2	5.2	5.3
Total In-City Retail Demand (mgd)	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Basline Demand without Codes or SFPUC Conservation Programs	**80.3**	**82.8**	**87.7**	**92.0**	**94.2**	**96.7**	**100.0**
Less Savings from Codes	*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**
Less Savings from 2005-30 SFPUC Conservation Programs	*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**
Savings from Codes & SFPUC Conservation Programs	***2.3***	***6.2***	***11.0***	***15.6***	***18.8***	***21.3***	***22.9***
Per Capita Demand (Gal/Day/Person)							
Population (1,000)	787	835	855	875	896	917	963
Basline Demand without 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

[1] 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 exluding 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)

Single Family In-City Retail Demand (mgd)	**2010**	**2012**	**2014**	**2016**	**2018**	**2020**
Basline Demand without Codes or SFPUC Conservation Programs	**20.3**	**20.3**	**20.3**	**20.4**	**20.4**	**20.5**
Less Savings from Codes	*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**
Less Savings from 2005-30 SFPUC Conservation Programs	*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**
Savings from Codes & SFPUC Conservation Programs	***2.2***	***2.8***	***3.4***	***3.9***	***4.4***	***4.9***
Multi Family In-City Retail Demand (mgd)	**2010**	**2012**	**2014**	**2016**	**2018**	**2020**
Basline Demand without Codes or SFPUC Conservation Programs	**32.1**	**32.5**	**32.8**	**33.4**	**34.0**	**34.7**
Less Savings from Codes	*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**
Less Savings from 2005-30 SFPUC Conservation Programs	*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**
Savings from Codes & SFPUC Conservation Programs	***2.9***	***3.7***	***4.5***	***5.3***	***6.1***	***7.0***
Non Residential In-City Retail Demand (mgd)	**2010**	**2012**	**2014**	**2016**	**2018**	**2020**
Basline Demand without Codes or SFPUC Conservation Programs	**25.2**	**26.7**	**28.2**	**29.4**	**30.4**	**31.4**
Less Savings from Codes	*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**
Less Savings from 2005-30 SFPUC Conservation Programs	*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**
Savings from Codes & SFPUC Conservation Programs	***1.0***	***1.6***	***2.2***	***2.7***	***3.2***	***3.7***
Other (mgd)	**2010**	**2012**	**2014**	**2016**	**2018**	**2020**
Builders & Contractors, Docks & Shipping	0.2	0.2	0.2	0.2	0.2	0.2
System Losses Excluding Meter Under-Registration (mgd)[1]	**2010**	**2012**	**2014**	**2016**	**2018**	**2020**
Calculated as % of Adjusted Baseline Demand	5.0	5.1	5.1	5.1	5.2	5.2
Total In-City Retail Demand (mgd)	**2010**	**2012**	**2014**	**2016**	**2018**	**2020**
Basline Demand without Codes or SFPUC Conservation Programs	**82.8**	**84.8**	**86.7**	**88.6**	**90.3**	**92.0**
Less Savings from Codes	*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**
Less Savings from 2005-30 SFPUC Conservation Programs	*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**
Savings from Codes & SFPUC Conservation Programs	***6.2***	***8.1***	***10.1***	***12.0***	***13.8***	***15.6***
Per Capita Demand (Gal/Day/Person)						
Population (1,000)	835	843	851	859	867	875
Basline Demand without 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

[1] 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 exluding 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

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San Francisco,
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Reception:
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Planning
Information:
415.558.6377

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**

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.[1] ABAG maintains its own set of regional models and develops each forecast with its in-house experts and private economic consultants.[2] 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.[3] 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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[1] Please see ABAG's summary of its research and forecasting on its website: http://www.abag.ca.gov/planning/research/index.html

[2] 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.

[3] 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 –

Potrero HOPE SF Master Plan Demand Memo

SAN FRANCISCO
PLANNING DEPARTMENT

MEMO

1650 Mission St.
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San Francisco,
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Reception:
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DATE: June 4, 2013

TO: Fan Lau, SFPUC

FROM: Elizabeth Purl, Environmental Planning

CC: Chris Kern, SFPUC

RE: Potrero HOPE SF Master Plan Project Water Supply Assessment Request - Revised

The purpose of this memorandum is to provide the specific project information necessary for the San Francisco Public Utilities Commission (SFPUC) to prepare a Water Supply Assessment (WSA) for the proposed Potrero HOPE SF Master Plan Project (Potrero HOPE Project). 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." Specifically, the project description and estimated project water demand are detailed below. Estimated water demand is based upon calculations prepared by the CEQA consultant for the proposed project (see the attached memo dated May 14, 2012 from Atkins). This memo supersedes the previous submittal for this project dated May 30, 2013.

Project Description

The Potrero HOPE Project (project) is a primarily residential mixed-use project that would include up to 1,700 multifamily housing units and about 7 acres of open space. **Table 1** summarizes the existing uses and proposed uses under the project. The proposed project would be developed on an approximately 39-acre site located in the Potrero Hill neighborhood about one and one-half blocks west of I-280 and four blocks east of U.S. 101. The site is roughly bounded by 22nd Street and the Potrero Hill Recreation Center and adjacent properties to the north; Texas Street to the east; 26th Street to the south; and Wisconsin Street to the west. The project site consists of several parcels and is currently developed with 606 units of multifamily public housing with associated internal roadways and surface parking lots. All of the existing buildings would be demolished and the street pattern would be reconfigured as part of the project, resulting in about 13.2 acres of paved streets. In addition, the proposed project would include up to 1,000 vehicle parking spaces in garages and up to 640 on-street parking spaces, along with approximately 415 bicycle parking spaces throughout the site.

Upon completion, the project would have up to approximately 3,876 residents; currently, there are about 1,200 residents on site.

Table 1: Existing and Proposed Uses

Use	Existing	Proposed	Net New
Residential	606 units	1,700 units	1,094
Institutional (Community Center)	-	35,000 gsf[1]	35,000 gsf
Retail/Flex Space	-	15,000 gsf	15,000 gsf

Note: mgd = million gallons per day

Project Water Demand

Water demand was calculated using water demand factors from various planning documents, including the 2010 Urban Water Management Plan (UWMP) prepared by the SFPUC (see attached memo dated May 14, 2012 prepared by Atkins). Please note that the inputs used are based on the maximum total number of residential units and square footage of the proposed project, and these numbers do not take into consideration existing occupied building space and residents. Project alternatives are being considered that could reduce the number of units and the project population; however, the maximum proposed project is used here to provide a conservative "worst-case" scenario. Furthermore, the calculations are based on a higher per-capita water demand than is used by the SFPUC in the 2010 UWMP.

The total annual water demand of the proposed project would be 95 million gallons per year (or 0.26 million gallons per day). Table 2 summarizes water demand based on land uses.

Table 2: Projected Water Demand

Use	Units/Area	Residents/ Employees	Demand Factor	Water Demand (mgd)[1]
Residential	1,700 units	3,876	60.8 gpcd[2]	0.24
Retail/Flex Space	15,000 gsf	34	53.9 gpcd	0.0018
Community Center	35,000 gsf	-	0.105 gpd/sf[3]	0.0037
Open Space	7 acres	-	0.05 gpd/sf	0.015
Total				**0.26**

Source: Bridge Housing/Atkins
Notes:
1. mgd = million gallons per day
2. gpcd = gallons per capita per day
3. gpd/sf = gallons per day per square foot

Construction of the proposed project is expected to occur in three phases between 2015 and 2025 or later. Although the precise number of units in each phase is not known at this time, it was assumed that the first phase would include approximately 25 percent of the residential units; the second phase would include approximately 50 percent of the residential units, as

well as the retail/flex and community center components; and the remaining 25 percent of the residential units would be built out in the third phase. Phase 1 would be occupied by 2020, Phase 2 would be occupied by 2025, and Phase 3 would be occupied after 2025. **Table 3** summarizes water demand based on project phasing.

Table 3: Water Demand Based on Project Phasing

	2015	2020	2025	2030	2035
Total Demand of Proposed Project (mgd)	-	0.06	0.19	0.26	0.26

Note: mgd = million gallons per day

Project Water Discharge

Approximately 90 percent of water supplied is discharged as wastewater into the sewer system. The wastewater discharge is therefore estimated at 0.234 mgd (0.26 mgd*0.90= 0.234 mgd).

We appreciate your attention to this request. Should you have questions or need additional information from the Planning Department or the project sponsor, please contact me at 415-575-9028 or elizabeth.purl@sfgov.org.

MEMORANDUM

To: Rachel Schuett and Nannie Turrell

From: Atkins

Date: Monday, May 14, 2012

Subject: Potrero HOPE SF Master Plan Draft EIR Water Demand and Wastewater Discharge Memorandum

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In order to estimate water demand and wastewater discharge associated with the implementation of the Potrero HOPE SF Master Plan, water demand factors concomitant with the proposed land uses were taken from various San Francisco Bay Area planning documents. Sources for the water demand factors are the San Francisco Public Utilities Commission (SFPUC) 2010 Urban Water Management Plan (UWMP), the Treasure Island/Yerba Buena Island Redevelopment Project EIR, and the 300 Airport Boulevard Project EIR (City of Burlingame).

The 2010 UWMP was used to determine appropriate residential and retail water demand factors. The Potrero HOPE SF Master Plan would consist of multi-family housing units, commercial land uses, and a community center.

This memo includes water demand and wastewater discharge projections for Alternative 1, Proposed Action Alternative as well as Alternative 2, Reduced Development Alternative; Alternative 3, Housing Replacement Alternative; and Alternative 4, No Build Alternative.

ALTERNATIVE 1 – PROPOSED ACTION ALTERNATIVE

Residential Demand

To determine a multi-family residential water demand factor, the following calculations/assumptions were utilized:

- According to SFPUC 2010 UWMP, total citywide multi-family residential retail demand for 2010 was 29.2 million gallons per day (mgd);
- Total number of multi-family housing units citywide in 2010 was 239,999. The average number of residents per multi-family housing unit for 2010 was 2;
- Therefore, 29,200,000 gallons per day/239,999 housing units/2 persons per housing unit[1] = **60.8 gallons per person per day (gpcd).**[2]

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[1] SFPUC 2010 Urban Water Management Plan, Appendix D, Table 6: SFPUC Retail Demand Model Updated Multi Family Persons Per Household Projection. Page 9 of 49, April 21, 2011, website: http://sfwater.org/modules/showdocument.aspx?documentid=1054, accessed April 11, 2012.

Commercial Demand

- According to the 2010 UWMP Appendix D, the water demand rate for the retail sector is **53.9 gallons per employee day (GED).**

Community Center Demand

- According to the Treasure Island/Yerba Buena Island Redevelopment Project EIR, the demand factor for a Community Center land use is approximately **0.105 gpd per square foot (gpd/sf).**[3]

Open Space/Irrigation Demand

- According to the water demand analysis prepared by BKF Engineers for the recent 300 Airport Boulevard Project in the City of Burlingame, irrigation water demand is equal to **0.05 gpd/sf.**

Calculations

Alternative 1, Proposed Action. Table 1 presents the land uses that would be developed under the proposed action and their respective size and anticipated occupancy (where applicable).

TABLE 1
ALT 1 - PROPOSED ACTION SUMMARY TABLE

	Total	Residents/Employees
Total Housing Units	1,700	3,876
Retail/Flex Space	up to 15,000 sf	34[b]
Community	up to 35,000 sf	--
Open Space[a]	approximately 7 acres	--

Source: BRIDGE Housing, 2012.

Note:

a. Includes parks, plazas, stairs, hillsides, shared courtyards, and private yards.

b. Association of Bay Area Governments, 1987 Input-Output Model and Economic Multipliers for the San Francisco Bay Region, March 1995. Multiplier for "Retail Trade" requires 450 sf per employee. As such 15,000 sf of proposed retail/450 sf = ~34 employees.

Table 2 summarizes the proposed project's land uses, associated water demand factors, and total water demand for each land use.

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2 For comparison the Candlestick Point-Hunters Point Shipyard Phase II Development Plan EIR relied on a residential water demand rate of 62 gallons per day per capita based on the 2005 SFPUC UWMP average combined single-family and multi-family residential demand rate. According to the 2010 SFPUC UWMP, the combined single-family and multi-family residential water demand rate is 50 gallons per day per capita (see page 34 of the 2010 SFPUC UWMP).

3 This calculation used water demand from the Pier 1 Community Center, as identified in the Treasure Island/Yerba Buena Redevelopment Project EIR. Water demand = 3,675 gpd; Pier 1 Community Center = 35,000 sf; 3,675 gpd/35,000 sf = 0.105 gpd/sf

TABLE 2
ALT 1 - PROPOSED ACTION WATER DEMAND

Use	Total Use Area	Residents/Employees	Demand Factor	Water Demand (mgd)
Residential	1,700	3,876	60.8 gpcd	0.24
Retail/Flex Space	up to 15,000 sf	34[b]	53.9 ged	0.0018
Community	up to 35,000 sf	--	0.105 gpd/sf	0.0037
Open Space[a]	approximately 7 acres	--	0.05 gpd/sf	0.015
			TOTAL	**0.26**

Source: BRIDGE Housing, 2012.

Note:

a. Includes parks, plazas, stairs, hillsides, shared courtyards, and private yards.

b. Association of Bay Area Governments, 1987 Input-Output Model and Economic Multipliers for the San Francisco Bay Region, March 1995. Multiplier for "Retail Trade" requires 450 sf per employee. As such 15,000 sf of proposed retail/450 sf = ~34 employees.

Based on the summation of the individual water demand calculations presented in Table 2, the total water demand associated with the proposed project would be approximately **0.26 mgd or 95 million gallons per year (mgy).**

Wastewater Discharge

According to a response to data request from Betsey Eagon, SFPUC, approximately 90 percent of water supplied is discharged as wastewater into the sewer system. As such, the estimated wastewater discharge for Alternative 1, the Project Action Alternative is **0.234 mgd** (0.26 mgd *0.90 = 0.234 mgd). This equates to approximately **85 mgy** of wastewater discharge.

ALTERNATIVE 2 – REDUCED DEVELOPMENT ALTERNATIVE

The same water demand factors identified for Alternative 1, above, were used to determine residential, commercial, community center, and irrigation demand for Alternative 2.

Calculations

Alternative 2, Reduced Development Alternative. Table 3 presents the land uses that would be developed under the Reduced Development Alternative and their respective size and anticipated occupancy (where applicable).

TABLE 3
ALT 2 - REDUCED DEVELOPMENT ALTERNATIVE SUMMARY TABLE

	Total	Residents/Employees
Total Housing Units	1,280	2,918
Retail/Flex Space	up to 15,000 sq ft	34[b]
Community	up to 25,000 sq ft	--
Open Space[a]	approximately 7 acres	--

Source: BRIDGE Housing, 2010.

Notes:

a. Includes parks, plazas, stairs, hillsides, shared courtyards, and private yards.

b. Association of Bay Area Governments, 1987 Input-Output Model and Economic Multipliers for the San Francisco Bay Region, March 1995. Multiplier for "Retail Trade" requires 450 sf per employee. As such 20,000 sf of proposed retail/450 sf = ~34 employees.

Table 4 summarizes the Reduced Development Alternative's land uses, associated water demand factors, and total water demand for each land use.

TABLE 4
ALT 2 - REDUCED DEVELOPMENT ALTERNATIVE WATER DEMAND

Use	Total Use Area	Residents/Employees	Demand Factor	Water Demand (mgd)
Residential	1,280	2,918	60.8 gpcd	0.177
Retail/Flex Space	up to 15,000 sq ft	34[b]	53.9 ged	0.0018
Community	up to 25,000 sq ft	--	0.105 gpd/sf	0.0026
Open Space[a]	approximately 7 acres	--	0.05 gpd/sf	0.015

Source: BRIDGE Housing, 2012.

Note:

a. Includes parks, plazas, stairs, hillsides, shared courtyards, and private yards.

b. Association of Bay Area Governments, 1987 Input-Output Model and Economic Multipliers for the San Francisco Bay Region, March 1995. Multiplier for "Retail Trade" requires 450 sf per employee. As such 15,000 sf of proposed retail/450 sf = ~34 employees.

As shown in Table 4, above, the total water demand associated with the Reduced Density Alternative would be approximately **0.2 mgd** or **73 mgy.**

Wastewater Discharge

Using the same methodology as described for Alternative 1, the estimated wastewater discharge for Alternative 2 is **0.18 mgd** (0.2 mgd*0.90 = 0.18 mgd). This equates to approximately **65.7 mgy** of wastewater discharge.

ALTERNATIVE 3 – HOUSING REPLACEMENT ALTERNATIVE

Alternative 3 would replace the existing onsite structures in kind. No additional housing units would be constructed and the existing number of residents would not change. Under this alternative, there would be no change in water demand or wastewater discharge.

ALTERNATIVE 4 – NO BUILD ALTERNATIVE

Under this alternative the existing structures and tenants on the project site would remain and no new buildings or uses would be constructed. Therefore, the water demand and wastewater discharge would not change.

Appendix 4.13D CCSF. Public Utilities Commission Resolution No. 13-0110. July 9, 2013.

PUBLIC UTILITIES COMMISSION

City and County of San Francisco

RESOLUTION NO. **13-0110**

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 Potrero HOPE SF Master Plan's 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 Potrero HOPE SF Master Plan; 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 Potrero HOPE SF Master Plan, 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 Potrero HOPE SF Master Plan 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.

Donna Hood

Secretary, Public Utilities Commission