# 2015 Urban Water Management Plan

## for the City of Burlingame

June 2016

Erler & Kalinowski, Inc.

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## ABBREVIATIONS

| | |
|---|---|
| ABAG | Association of Bay Area Governments |
| ADWF | average dry weather flow |
| AMR | automatic meter reading |
| BAWSCA | Bay Area Water Supply and Conservation Agency |
| CASGEM | California Statewide Groundwater Elevation Monitoring |
| Census | United States Census |
| CII | commercial, industrial, and institutional |
| CUWCC | California Urban Water Conservation Council |
| CWC | California Water Code |
| DMM | demand management measures |
| DRT | Drought Response Tool |
| DOF | Department of Finance |
| DSS Model | Demand Management Decision Support System Model |
| DWR | Department of Water Resources |
| EKI | Erler & Kalinowski, Inc. |
| EOP | Emergency Operations Plan |
| ERP | Emergency Response Plan |
| ETo | reference evapotranspiration |
| GPCD | gallons per capita per day |
| gpf | gallons per flush |
| HET | High-Efficiency Toilet |
| HTWTP | Harry Tracy Water Treatment Plant |
| ISA | Interim Supply Allocation |
| ISG | Individual Supply Guarantee |
| ISL | Interim Supply Limitation |
| MCL | Maximum Contaminant Level |
| MG | million gallons |
| MGD | million gallons per day |
| gpm | gallons per minute |
| PG&E | Pacific Gas & Electric |
| psi | pounds per square inch |
| PWEP | Potable Water Emergency Plan |
| R-GPCD | residential gallons per capita per day |
| RWQCB | Regional Water Quality Control Board |
| RWS | Regional Water System |
| SCADA | Supervisory Control and Data Acquisition |
| SEMS | Standardized Emergency Management System |
| SFPUC | San Francisco Public Utilities Commission |
| SGMA | Sustainable Groundwater Management Act |
| Strategy | BAWSCA Long Term Reliable Water Supply Strategy |
| SWRCB | State Water Resources Control Board |
| Target | water use target |
| TDS | total dissolved solids |
| Title 22 | California Code of Regulations, Title 22 |
| UAW | unaccounted for water |
| USEPA | United States Environmental Protection Agency |
| UWMP | Urban Water Management Plan |

| | |
|---|---|
| UWMP Act | Urban Water Management Planning Act |
| WCIP | Water Conservation Implementation Plan |
| WRPR | Water Rationing Plan Resolution |
| WQD | Water Quality Division |
| WSA | Water Supply Assessment |
| WSAP | Water Shortage Allocation Plan |
| WSCP | Water Shortage Contingency Plan |
| WSIP | Water System Improvement Program |
| WWTP | wastewater treatment plant |

# 1. INTRODUCTION AND PLAN PREPARATION

In 1983, the California Legislature enacted the Urban Water Management Planning Act (UWMP Act) (California Water Code Sections 10610 - 10657). The UWMP Act states that every urban water supplier that provides water to 3,000 or more customers, or that provides over 3,000 acre-feet of water annually, should make every effort to ensure the appropriate level of water service reliability to meet the needs of its customers during normal, dry, and multiple dry years. Historically, the UWMP Act required urban water suppliers to update their Urban Water Management Plan (UWMP or Plan) for submittal to the Department of Water Resources (DWR) in years ending in five and zero. However, because of recent changes in UWMP Act requirements, State law has extended the deadline for the 2015 Plans to 1 July 2016. On behalf of the City of Burlingame (City or Burlingame), Erler & Kalinowski, Inc. (EKI) has prepared this 2015 update to the City's UWMP in accordance with the UWMP Act.

## 1.1 COMPLIANCE WITH THE UWMP ACT, INCLUDING CHANGES SINCE 2010

> *10620. (b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.*

In 2015, the City provided water to more than 3,000 customers, and is therefore subject to requirements of the UWMP Act (see Appendix A, DWR Table 2-1). The City's 2015 UWMP is an individual UWMP that describes how the current and future water resources and demands within the Burlingame service area will be managed to provide an adequate and reliable water supply (see Appendix A, DWR Table 2-2). Additionally, and as applicable, Burlingame's 2015 UWMP reflects the following significant revisions to the UWMP Act that have been made since 2010.

- Demand Management Measures – California Water Code (CWC) Section 10631(f)(1) and (2) Assembly Bill 2067, 2014;
- Submittal date – CWC Section 10621(d) and Assembly Bill 2067, 2014;
- Electronic submittal – CWC Section 10644(a)(2) and Assembly Bill 2067, 2014;
- Standardized forms – CWC Section 10644(a)(2) and Assembly Bill 2067, 2014;
- Water Loss – CWC Section 10631(e)(1)(J) and (e)(3)(A) and (B) Senate Bill 1420, 2014;
- Estimating future water savings – CWC Section 10631(e)(4) and Senate Bill 1420, 2014;
- Voluntary reporting of energy intensity – CWC Section 10631.2(a) and (b) Senate Bill 1036, 2014; and
- Defining water features – CWC Section 10632(b) and Assembly Bill 2409, 2010.

Burlingame's 2015 UWMP has been prepared in general accordance with the format suggested in DWR's *2015 Urban Water Management Plans Guidebook for Urban Water Suppliers*, dated March 2016 (Guidebook; DWR, 2016a). Text from the UWMP Act has been included in blue boxes at beginning of relevant sections of this UWMP. The information presented in the respective UWMP sections and the associated text, figures, tables and charts are collectively intended to fulfill the requirements of that sub-section of the UWMP Act. To the extent

practicable, supporting documentation has also been provided in Appendices A through N. Other sources for the information contained herein are provided in the references section of the document.

Per CWC Section 10644(a)(2), selected information for the 2015 UWMP updates must be presented in standardized tables for electronic submittal to DWR. A complete set of DWR tables is included in Appendix A. In addition, to the extent applicable, text and tables in the main body of the UWMP document have been cross-referenced to the companion DWR tables.

## 1.2 COORDINATION AND OUTREACH

As described below and in Section 9, this UWMP has been prepared in coordination with the Bay Area Water Supply and Conservation Agency (BAWSCA), the BAWSCA member agencies, the San Francisco Public Utilities Commission (SFPUC), the public, and other appropriate entities.

### 1.2.1 Role of BAWSCA and the UWMP Common Language

Among its other functions, BAWSCA represents the City and the 25 other water districts, cities, and utilities, collectively referred to as the "Wholesale Customers", in negotiations and other coordination efforts with the SFPUC. Together with the SFPUC, BAWSCA developed common language for inclusion in each Wholesale Customers' 2015 UWMP regarding the following common issues:

- Description of BAWSCA;
- Regional Water Demand and Conservation Projections;
- Long Term Reliable Water Supply Strategy (Strategy);
- Tier 1 and Tier 2 Water Shortage Allocations;
- Individual Supply Guarantees (ISGs);
- The 2018 Interim Supply Limitation (ISL);
- Interim Supply Allocations (ISAs);
- Environmental Enhancement Surcharge;
- 2018 SFPUC Decisions;
- Quantity and reliability of SFPUC's Wholesale Water Supply;
- Climate Change; and
- The Current Drought (2012 to Present).

For clarification purposes, and as shown below, the common language provided by BAWSCA is shown in grey font and has been indented for emphasis; it is otherwise presented unchanged from the original text provide by BAWSCA. As a result, there may be some redundancy in the information presented and the number of times that certain terms are abbreviated or defined. A description of BAWSCA's role generally and related to the 2015 UWMP development process is provided below.

> BAWSCA provides regional water reliability planning and conservation programming for the benefit of its 26 member agencies that purchase wholesale water supplies from the San Francisco Public Utilities Commission. Collectively, the BAWSCA member agencies deliver water to over 1.74 million residents and nearly 40,000

commercial, industrial and institutional accounts in Alameda, San Mateo and Santa Clara Counties.

BAWSCA also represents the collective interests of these wholesale water customers on all significant technical, financial and policy matters related to the operation and improvement of the SFPUC's Regional Water System (RWS).

BAWSCA's role in the development of the 2015 UWMP updates is to work with its member agencies and the SFPUC to seek consistency among the multiple documents being developed.

### 1.2.2 Wholesale Coordination

*10631. (j) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).*

The SFPUC is a wholesale water supplier to all of the BAWSCA member agencies, and is the only wholesale water supplier to Burlingame. As part of the coordination effort for the 2015 UWMP, and in compliance with CWC Section 10631(j), Burlingame supplied BAWSCA with its water demand projections through 2040 for transmittal to the SFPUC.[1]

Additionally, as described in more detail in Section 6, Burlingame has relied upon the water supply reliability projections provided by the SFPUC for the purposes of analyzing the reliability of its SFPUC supplies during normal and dry years through 2040 (see Appendix A, DWR Table 2-4)[2].

### 1.2.3 Agency Coordination

*10620. (d) (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.*

As a member of BAWSCA and the BAWSCA Water Management Representative Committee, Burlingame has coordinated closely with BAWSCA and its 25 other member agencies

[1] Email to BAWSCA, dated 27 April 2016.
[2] Email from BAWSCA dated 6 January 2016, and information provided by the SFPUC, Appendix G.

throughout the update of Burlingame's UWMP. On 26 January 2016, Burlingame staff representatives attended a webinar on supply reliability hosted by BAWSCA. During the webinar, BAWSCA and the member agencies reviewed the water supply reliability projections provided by the SFPUC, as well as the updated dry year supply allocations described in Section 6. Representatives for the City also attend monthly water management meetings with BAWSCA and its member agencies that, among other topics, include discussion of items pertinent to the preparation of the 2015 UWMPs.

The Burlingame Wastewater Treatment Facility (WWTP) receives wastewater from the Burlingame service area as well as portions of the Town of Hillsborough. The WWTP is owned by the City and operated and maintained by Veolia Water North America, which has contracted with the City since 1972. The City works with Veolia Water North America to provide treated recycled water for internal re-use within the WWTP.

In addition, on 2 February 2016, Burlingame notified the County of San Mateo of Burlingame's intent to prepare this 2015 UWMP and the associated public hearing (Table 1-1). A copy of the notice is provided in Appendix B.

### 1.2.4 Public Participation

> *10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.*

On 24 May 2016 and 2 June 2016, the City published a notice in the *Examiner – Boutique & Villager* daily newspaper informing the public that the 2015 UWMP would be available for public review at the Burlingame City Hall, libraries, and on the Burlingame website, and that a public hearing would be held on 6 June 2016, consistent with requirements of California Government. Copies of the newspaper notices are included in Appendix C. A copy of the Public Review Draft 2015 UWMP was posted on the City's webpage for public review on 24 May 2016.

**Table 1-1**
**Notification to Cities, Counties, and Other Agencies (DWR Table 10-1)**
City of Burlingame, California

| Entity Name | Notification Required (a) | 60-Day Notice (b) | Notice of Public Hearing (c) | Provided Comments |
|---|---|---|---|---|
| Alameda County Water District | | ☐ | ☑ | no |
| Bay Area Water Supply and Conservation Agency | | ☐ | ☑ | no |
| California Water Service | | ☐ | ☑ | no |
| City of Brisbane | | ☐ | ☑ | no |
| City of Burlingame | yes | ☑ | ☑ | no |
| City of Daly City | | ☐ | ☑ | no |
| City of East Palo Alto | | ☐ | ☑ | no |
| City of Foster City/Estero Municipal Improvement District | | ☐ | ☑ | no |
| City of Hayward | | ☐ | ☑ | no |
| City of Menlo Park | | ☐ | ☑ | no |
| City of Millbrae | | ☐ | ☑ | no |
| City of Milpitas | | ☐ | ☑ | no |
| City of Mountain View | | ☐ | ☑ | no |
| City of Palo Alto | | ☐ | ☑ | no |
| City of Redwood City | | ☐ | ☑ | no |
| City of San Bruno | | ☐ | ☑ | no |
| City of Santa Clara | | ☐ | ☑ | no |
| City of Sunnyvale | | ☐ | ☑ | no |
| Coastside County Water District | | ☐ | ☑ | no |
| County of San Mateo | yes | ☑ | ☑ | no |
| Mid-Peninsula Water District | | ☐ | ☑ | no |
| North Coast County Water Dist. | | ☐ | ☑ | no |
| Purissima Hills Water District | | ☐ | ☑ | no |
| San Francisco Public Utilities Commission | | ☐ | ☑ | no |
| San Jose Municipal Water System | | ☐ | ☑ | no |
| Stanford University | | ☐ | ☑ | no |
| Town of Hillsborough | | ☐ | ☑ | no |
| Westborough Water District | | ☐ | ☑ | no |

Abbreviations:
"CWC" = California Water Code
"DWR" = California Department of Water Resources

Notes:
(a) The notifications listed in this table is required to be sent to any city or county within which the water supplier provides water, per CWC Sections 10621 and 10642.
(b) The 60-day notice was distributed to recipients on 22 January 2016.
(c) The notice of public hearing was distributed to recipients on 24 May 2016.

Code 6066[3]. The notice also informed the public that the 2015 UWMP public hearing would be held at Burlingame City Hall on 6 June 2016. A copy of the newspaper announcement is included in Appendix C.

### 1.3 UWMP STRUCTURE, STANDARD UNITS, AND BASIS FOR REPORTING

Per CWC Section 10644(a)(2), selected information for the 2015 UWMP updates must be presented in standardized tables for electronic submittal to DWR. A complete set of DWR tables is included as Appendix A. In addition, to the extent applicable, tables and text in the main body of the UWMP document have been cross-referenced to the companion DWR tables.

Per the Guidebook, the UWMP preparer is requested to complete a checklist of specific UWMP requirements to assist the DWR review of the submitted UWMP. The completed checklist is included in Appendix D.

Information presented in this UWMP is reported on a fiscal year basis. As such, “2015” refers to Fiscal Year 2014-15, and so forth. The units of measure for reporting water volumes is million gallons (MG) and is maintained consistently throughout the Plan, unless otherwise noted (see Appendix A, DWR Table 2-3).

Further, consistent with the Guidebook, the terms “water use”, “water consumption”, and “water demand” are used interchangeably in this UWMP.

[3] Government Code section 6066. Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.

# 2. SERVICE AREA AND SYSTEM DESCRIPTION

*10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
*10631. (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.*

The City of Burlingame (City or Burlingame) is located in San Mateo County, approximately 15 miles south of the City of San Francisco, California (Figure 2-1). The City is bordered by the City of Millbrae directly to the north, the City of San Mateo to the southeast, the town of Hillsborough to the south, the City of San Francisco watershed lands to the west, and San Francisco Bay to the east. The City's potable water system serves approximately 9,160 connections, both within the City limits and in the unincorporated Burlingame Hills area. The City also supplies potable water, primarily for irrigation purposes, to San Mateo County's Coyote Point Park. The higher-elevation, unincorporated Burlingame Hills is located west of the City, while Coyote Point is located southeast of the City along San Francisco Bay (Figure 2-2). The City's customers are mostly residential with a broad cross-section of offices, commercial, and industrial businesses.

Burlingame is a member of Bay Area Water Supply and Conservation Agency (BAWSCA) and purchases all of its potable water from the San Francisco Public Utilities Commission Regional Water System (SFPUC RWS). Water distribution, wastewater collection, water conservation, and maintenance of water quality are Burlingame's main water resource functions, as treated water purchased from the SFPUC RWS does not require further water treatment.

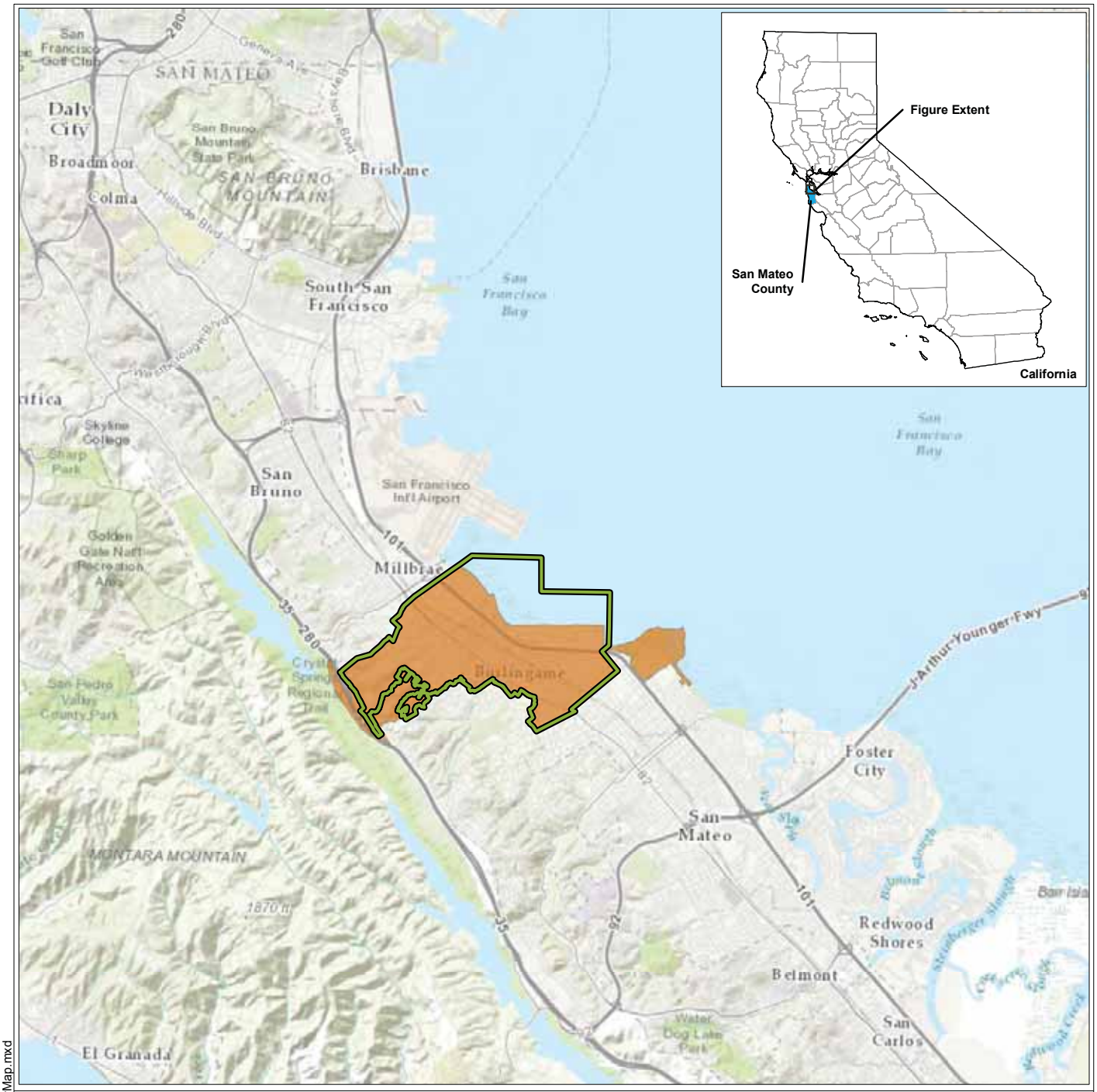
As required by the Urban Water Management Planning Act (UWMP Act), specific information about the Burlingame service area, population, and climate is provided below. A brief description of Burlingame's potable water distribution system is also included.

## 2.1 POPULATION AND EMPLOYMENT TRENDS WITHIN THE BURLINGAME SERVICE AREA

The historical and projected population and employment data from 2000 through 2040 within the Burlingame service area are shown in Tables 2-1 and 2-2 and the associated charts. Consistent with Department of Water Resources (DWR) requirements, the historical and current population served by the City has been estimated herein using the DWR Population Tool, which is based off of United States Census (Census) data, as documented in Section 4.1.

### 2.1.1 Future Population Growth

The City is predominantly zoned residential, with a commercial and industrial core in the eastern portion of the City and two centrally located commercial districts. Much of the City is "built out," allowing for only modest population increases in the future assuming continuation of current zoning and densities. The Association of Bay Area Governments (ABAG) provides population




## Legend

- City of Burlingame Boundary
- City of Burlingame Water Service Area

## Notes

1. All locations are approximate.

## Sources

World Topographic base map provided by ArcGIS Online (ESRI, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBease, IGN, Kadaster NL, Ordinance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, OpenStreetMap contributors, and the GIS User Community), obtained 20 June 2016.

N

0 2 4

(Approximate Scale in Miles)

# Erler & Kalinowski, Inc.

Regional Vicinity Map

City of Burlingame
2015 Urban Water Management Plan
Burlingame, CA
June 2016
EKI A20031.30

Figure 2-1

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projections for San Francisco Bay Area cities (ABAG, 2013). The ABAG staff collects data on current land use and development policies of local governments and uses this information in its estimates of population growth. ABAG population projections are only for the incorporated City limits and do not included the unincorporated Burlingame Hills, which is also served water by the City. The future service area population was estimated using the ABAG (2013) projections for the City of Burlingame, adjusted for the estimated 420 housing units in the Burlingame Hills area (City of Burlingame, 2010b). The projections are based primarily on the growth anticipated by ABAG, but also take into account the population estimated by the DWR Population Tool, which is discussed further below in Section 4.1.

The total projected population within the Burlingame service area is expected to be 39,530 by 2040, which is equivalent to a 1.1% average annual increase over 25 years relative to 2015. Table 2-1 shows the projected population for the service area through 2040.

### 2.1.2 Future Employment Growth

The City also supplies water to its commercial, industrial, and institutional (CII) customers, which were collectively estimated to provide 31,005 jobs[4] within the Burlingame service area in 2015.

ABAG employment estimates published in 2009 and 2013 were significantly different, with the 2009 estimates projecting limited jobs growth and the 2013 projections anticipating a significantly higher level of job growth for the City of Burlingame. Future employment projections are therefore estimated based on a midpoint of ABAG's 2009 and 2013 projections.

Given that the Burlingame service area is largely built out, the future employment projections for the service area are based on a growth rate midway between the 2009 and 2013 ABAG projections for the City of Burlingame. The projections are based on the growth anticipated by ABAG, but also take into account the estimated number of jobs reported in the Burlingame 2015-2023 Housing Element (i.e., 29,540 jobs in 2010). As shown in Table 2-2 and the associated chart, significant employment growth is anticipated in the Burlingame service area. By 2040, employment within the Burlingame service area is anticipated to grow to 40,164 jobs, an increase of 30% relative to 2015.

## 2.2 CLIMATE

The Burlingame service area is located within a region with a climate generally considered temperate. As shown in Table 2-3, rainfall in the area averages 19.9 inches per year and is generally confined to the wet season from late October to early May. The average reference evapotranspiration (ETo) for the region is 45 inches per year. The ETo is a standard measurement related to the water demand by plants in a specific region. Because the average annual ETo is approximately 30 inches more than the average annual precipitation, and because 96% of the annual precipitation occurs between the months of October and April, growing turf or other plantings in this region requires a significant amount of irrigation during the

[4] The estimated number of jobs in 2015 is based on the number of jobs in 2010 reported by Burlingame's 2015-2023 Housing Element, adjusted based on the projected ABAG growth rate.

N

0 4,000 8,000

(Approximate Scale in Feet)

Legend

- City of Burlingame Water Service Area
- City of Burlingame
- Unincorporated County (Burlingame Hills)
- Coyote Point (See Note 3)

Notes

1. All locations are approximate.
2. Unincorporated areas of Burlingame are served with potable water by the City of Burlingame.
3. Regional Park with no residential demands.
4. Service area boundary is the same from baseline period through current.

Sources

Aerial base map provided by ArcGIS Online (ESRI, DigitalGlobe, GeoEeye, Earthstar Geopgrpahics, CNES/Airbus DS, USDA, AEX, Getmapping, Aerigrid, IGN, IGP, swisstopo, and the GIS User Community), obtained 20 June 2016.

**Erler & Kalinowski, Inc.**

City of Burlingame Service Area Map

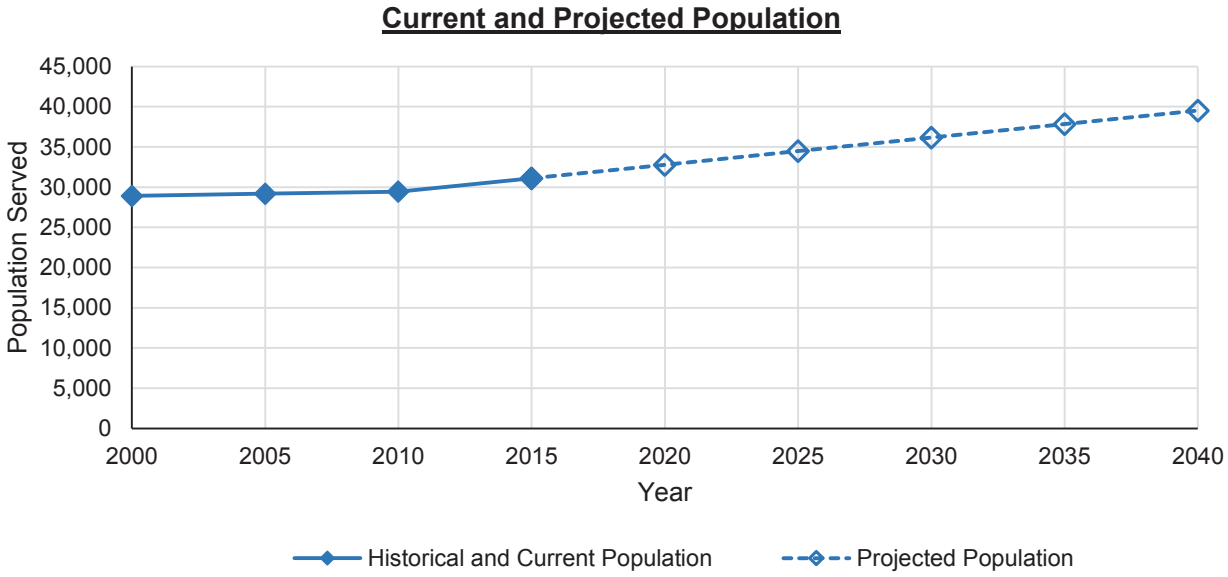
City of Burlingame
2015 Urban Water Management Plan
Burlingame, CA
June 2016
EKI A20031.30

Figure 2-2

Path: X:\A20031\Maps_30\2016\05\Fig2-2_Burlingame_ServiceAreaMap.mxd

**Table 2-1**
**Historical and Projected Service Area Population (DWR Table 3-1)**
City of Burlingame, California

| Historical and Current Service Area Population (a) | | | | | |
|---|---|---|---|---|---|
| | **2000** | **2005** | **2010** | **2015** | **--** |
| Population Served | 28,900 | 29,175 | 29,450 | 31,109 | -- |
| **Projected Service Area Population** | | | | | |
| | **2020** | **2025** | **2030** | **2035** | **2040** |
| Projected Population | 32,793 | 34,477 | 36,162 | 37,846 | 39,530 |



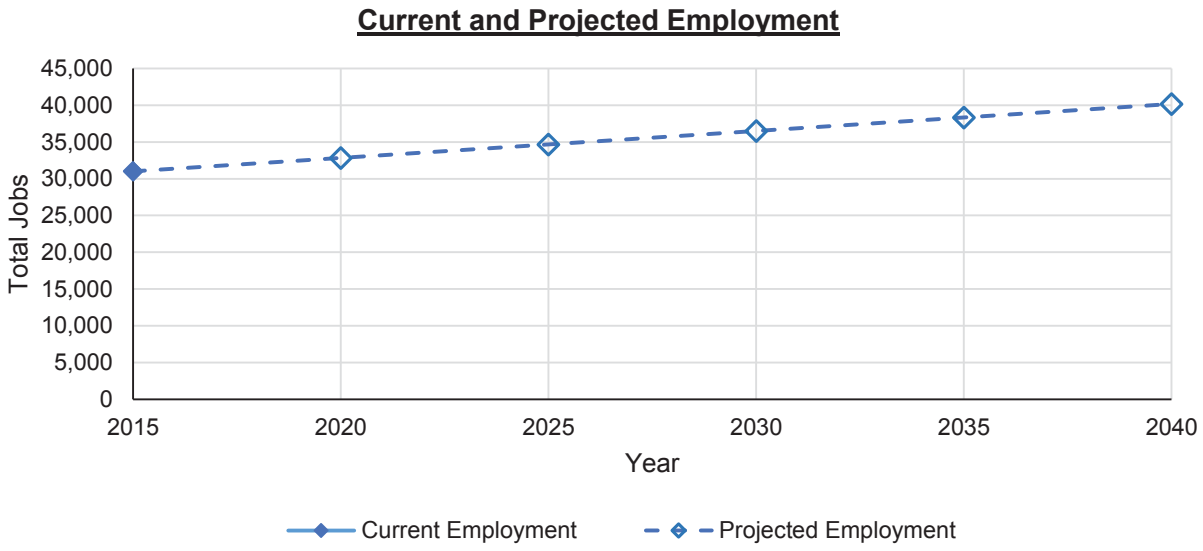

Abbreviations:
"ABAG" = Association of Bay Area Governments
"DWR" = California Department of Water Resources

Notes:
(a) Historical and current population data are further documented in Tables 3-1 and 4-1.
(b) Projected population growth for the Burlingame service area was estimated based on population projections by ABAG (Reference 1) and an estimated population for the unincorporated Burlingame Hills area.

References:
(1) ABAG, 2013. Association of Bay Area Governments Projections 2013.

**Table 2-2**
**Current and Projected Service Area Employment**
City of Burlingame, California

| Current and Projected Service Area Employment | | | | | | |
|---|---|---|---|---|---|---|
| | **2015** | **2020** | **2025** | **2030** | **2035** | **2040** |
| Total Jobs | 31,005 | 32,837 | 34,669 | 36,500 | 38,332 | 40,164 |



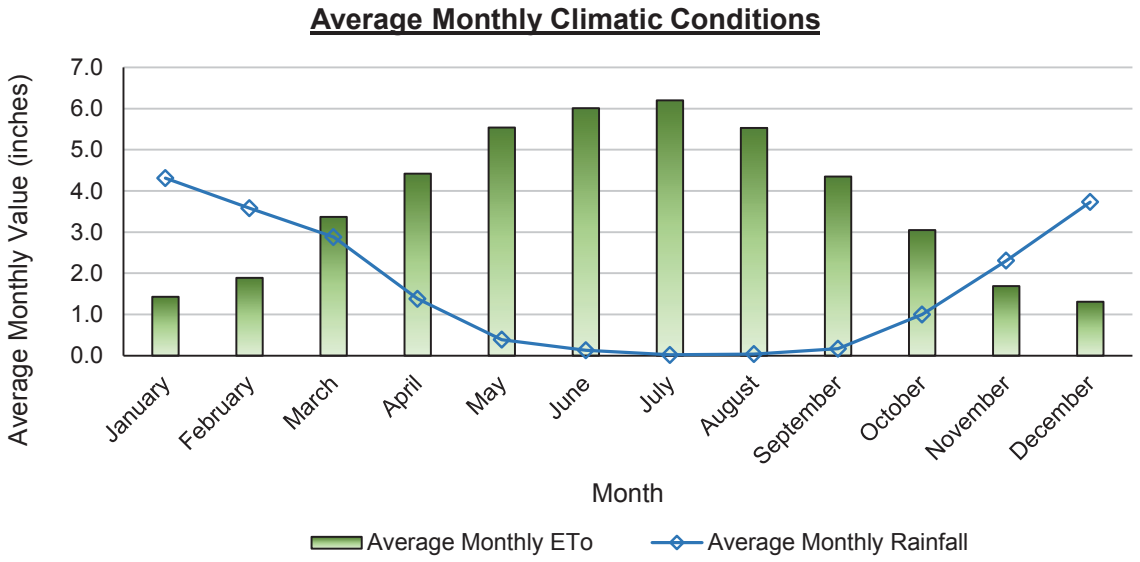

Abbreviations:
"ABAG" = Association of Bay Area Governments

Notes:
(a) Projected employment growth for the Burlingame service area was estimated based on an assumed level of growth, approximately equal to the average of the 2009 and 2013 ABAG projected population growth for the City of Burlingame (References 1 and 2).

References:
(1) *ABAG, 2009. Association of Bay Area Governments Projections 2009.*
(2) *ABAG, 2013. Association of Bay Area Governments Projections 2013.*

**Table 2-3**
**Average Monthly Climatic Conditions**
City of Burlingame, California

| Month | Average Temperature (a) | | Standard Average ETo (b) (inches) | Average Rainfall (a) (inches) |
|---|---|---|---|---|
| | Min (°F) | Max (°F) | | |
| January | 42.6 | 55.8 | 1.4 | 4.31 |
| February | 45.0 | 59.1 | 1.9 | 3.58 |
| March | 46.2 | 61.2 | 3.4 | 2.88 |
| April | 47.7 | 63.8 | 4.4 | 1.38 |
| May | 50.2 | 66.7 | 5.5 | 0.39 |
| June | 52.8 | 70.0 | 6.0 | 0.13 |
| July | 54.1 | 71.4 | 6.2 | 0.02 |
| August | 55.0 | 72.0 | 5.5 | 0.04 |
| September | 54.8 | 73.4 | 4.4 | 0.17 |
| October | 52.1 | 70.2 | 3.1 | 1.00 |
| November | 47.4 | 62.9 | 1.7 | 2.31 |
| December | 43.3 | 56.4 | 1.3 | 3.73 |
| **Annual** | **49.3** | **65.2** | **45** | **19.9** |




Abbreviations:
"ETo" = reference evapotranspiration
"°F" = Degrees Fahrenheit

Notes:
(a) Temperature and Precipitation data are from the Western Regional Climate Center for Station #047769 SAN FRANCISCO INTL AP from 1 July 1945 to 20 January 2015.
(b) Reference evapotranspiration data are from the Department of Water Resources, California Irrigation Management Information System.

dry season. This irrigation demand contributes to the overall and observed seasonal variation in water demand throughout the Burlingame service area (see Section 7.4).

### 2.3 BURLINGAME WATER DISTRIBUTION SYSTEM

The City's distribution system consists of six pumping stations, seven water storage tanks, and buried pipes of varying compositions, ages, and sizes. The distribution system provides water to eight pressure zones within the City's water service area, as shown below (EKI, 2004).

| Zone Name | Elevation (feet above mean sea level) | |
|---|---|---|
| | Minimum | Maximum |
| Adeline Pressure Regulator | 170 | 430 |
| Alcazar | 240 | 420 |
| Aqueduct | 5 | 115 |
| Canyon Pressure Regulator | 150 | 280 |
| Donnelly | 100 | 310 |
| Hillside Pressure Tank | 100 | 180 |
| Mills | 340 | 600 |
| Skyview Pressure Tank | 540 | 618 |

Water is transferred between pressure zones through a system of pipes and pumping stations. The pumping stations are referred to as:

1. Easton,
2. Skyview,
3. Trousdale,
4. Donnelly,
5. Hillside, and
6. Sisters of Mercy.

Five of the pumping stations transfer water from the lower elevations of the City to the higher elevations, while the Sisters of Mercy station provides also provides fire flow to the Sisters of Mercy property. The sizes of the pumps range between 7.5 and 200 horsepower.

Water is stored in the City's seven water storage tanks at five sites that provide an aggregate water storage volume of 2.94 million gallons (MG) (EKI, 2004). The largest water storage facility is the Hillside Tank, which holds 1.5 MG. The smallest water storage facilities are the individual tanks at the Alcazar and Donnelly sites. There are two tanks at each site and each tank holds 0.05 MG.

Water is supplied to the City via six metered turnouts connected to SFPUC's Sunset Supply Pipeline and Crystal Springs Pipelines Nos. 2 and 3. Because the pressures in the SFPUC pipelines vary between 95 pounds per square inch (psi) and 105 psi, pressure reducing valves are in place at the turnouts to deliver water at consistent and manageable pressures to the City's distribution system.

Water from the turnouts is supplied to the Aqueduct Zone at sufficient pressure to supply end-users within this zone without additional pumping. As described above, to supply the elevated regions of the City, pumping stations boost water from the Aqueduct Zone to the more elevated pressure zones and their associated storage facilities.

Metered interties exist between the Burlingame water system and the City of Millbrae and the Town of Hillsborough water systems. Burlingame has served (sold) water to Millbrae in the past through the intertie. The City also has unmetered interties with the California Water Service Company along the southern portion of the distribution system. Burlingame has an understanding with Millbrae that it can buy or sell water in emergency situations or pursuant to project-specific agreements; however, under normal operating conditions Burlingame does not sell water to other agencies.

The following water system improvement projects are planned for construction or have been completed since the 2010 UWMP:

- Replacement of approximately 3,100 linear feet of new 4-inch, 8-inch, and 10-inch Ductile Iron water main along El Camino Real, together with all service connections, valves, fittings, fire hydrants, and appurtenances (construction anticipated July 2016);
- Installation of a new pump station control house and removal of soil off of the reservoir at the Hillside Reservoir (construction anticipated June 2016);
- Replacement approximately 650 linear feet of new 6-inch, 3,750 linear feet of new 8-inch, and 104 linear feet of new 4-inch Polyvinyl Chloride (PVC) and Ductile Iron pipe (DIP) water main along South Rollins Road (construction anticipated October 2016);
- Replacement of approximately 800 linear feet of old cast iron mains with new PVC water main on Morrell Avenue and Carolan Avenue (completed 2015);
- Moved inlet pipes into the reservoir to improve circulation at the Hillside Reservoir (completed 2014);
- Replacement of approximately 3,300 linear feet of old cast iron mains with new PVC and DIP water mains on Broadway, Burlingame Avenue, Adeline Drive, and Peninsula Avenue (completed 2014);
- Replacement of approximately 960 linear feet of old cast iron mains with new PVC water main on El Quanito Way after main breaks (completed 2013);
- Replacement of approximately 2,900linear feet of old cast iron mains with new PVC/DIP water mains on Burlingame Avenue (completed 2013);
- Replacement of approximately 3,900 linear feet of old cast iron mains with new PVC/DIP water mains of the downtown area including Chapin, Donnelly, Primrose, California and El Camino Real (completed 2012);
- Replacement of approximately 450 linear feet of old cast iron mains with new water main on Howard, Primrose and El Camino in preparation of the Safeway project (completed 2011); and
- Large subdivision replacement of approximately 7,300 linear feet of old water mains on California, Mills, Grove, Laguna and Lincoln (completed 2011).

# 3. SYSTEM WATER DEMANDS

*10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
*10631 (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:*

- *(A) Single family residential.*
- *(B) Multifamily.*
- *(C) Commercial.*
- *(D) Industrial.*
- *(E) Institutional and governmental.*
- *(F) Landscape.*
- *(G) Sales to other agencies.*
- *(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use or any combination thereof.*
- *(I) Agricultural.*
- *(J) Distribution system water loss.*

*10631. (e) (2) The water use projections shall be in the same five-year increments described in subdivision (a).*

For the purposes of this Urban Water Management Plan (UWMP), potable water demand is defined as the volume of potable water that the City of Burlingame (City or Burlingame) purchases from the San Francisco Public Utilities Commission Regional Water System (SFPUC RWS). Among other things, water demand is dependent on climate, population, industry, and the types of development present in a community. Sections 3.1 and 3.2 describe the historical and projected water demands for the residential, commercial, industrial, institutional, and landscape irrigation sectors within the Burlingame service area (water use sectors A through F and J, as described per California Water Code (CWC) Section 10631(e)(1)(A) though (F)). As described in Section 3.3, this discussion does not include demands for water use sectors per CWC Section 10631(e)(1)(G) through (I) as they are not applicable or present within the Burlingame service area.

## 3.1 CURRENT AND HISTORIC TOTAL WATER DEMAND

All demands within the Burlingame service area are currently met with potable water, with the exception of 0.3 MGD of recycled water, which is used internally within the Burlingame WWTP. The current and historical total water demands within the Burlingame service area include the water consumed by metered accounts in the service area ("metered water consumption"), unmetered water used by the Fire Department ("unmetered water consumption"), and the water that is lost within the distribution system ("losses"). Because the recycled water used by the Burlingame WWTP is produced and used internally and is never met with potable water, the 0.3 MGD of recycled water demand is not included in the historical or projected potable water demands discussed in this section.

### 3.1.1 Current and Historical Potable Water Demand

Total water demand within the Burlingame service area was approximately 1,283 million gallons (MG) in 2015. Table 3-1 and the associated charts show trends in potable water demand and per capita water use between 2005 and 2015. Water demand decreases observed between 2008 and 2010 likely reflect impacts of the 2007-2010 drought and the economic downturn, which resulted in lower residential and non-residential water use. The subsequent slight increase through 2013 is thought to reflect improved economic conditions. However, despite the improved economy in the Bay Area, subsequent requirements for water use cutbacks locally and the mandatory state-wide restrictions issued by the State Water Resources Control Board (SWRCB)[5] in response to the recent historic drought led to a significant decline in water use (i.e., a 30.8% reduction between 2013 and 2015 for the compliance period of June through December).[6]

As shown in Table 3-1 and the associated charts, per capita potable water use in the Burlingame service area has shown a decreasing trend over the past 10 years. The highest per capita water use was observed in 2005 at 162 gallons per capita per day (GPCD), whereas the lowest per capita water use was observed in 2015 at 113 GPCD.

Water demand within the Burlingame service area is measured using water meters that are installed at each customer account. Records of current and historical water use at each account are maintained by the City of Burlingame Public Works Department, in coordination with the Finance Department. Water demand within the Burlingame service area is tracked and reported on a bimonthly basis for the following sectors:

- Single Family Residential;
- Multi-Family Residential;
- Commercial;
- Industrial;
- Institutional/Governmental;
- Irrigation; and
- Other.

As shown in Table 3-2 and associated charts, the residential sector accounted for an average of approximately 59% of the potable water demand in the Burlingame service area between 2011 and 2015 (i.e., single family residential demands were approximately 41% of the total demand, while multi-family residential demands accounted for the remaining 17%). Burlingame has a

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[5] On 28 July 2014, the SWRCB adopted emergency regulations to mandate water agencies, including Burlingame, to implement their Water Shortage Contingency Plan and minimum actions to reduce outdoor water use. On 5 May 2015, SWRCB adopted Resolution 2015-0032 to mandate further minimum actions by water suppliers and their customers to reduce potable water use into 2016 and assigns a mandatory water conservation savings goal to each water supplier based on their residential water use. On 2 February 2016, the SWRCB voted to extend the reduction targets through October 2016. Burlingame has a SWRCB-mandated reduction target of 16%.

[6] SWRCB, Water Conservation Portal - Conservation Reporting; June 2015 - December 2015 Cumulative Savings and Urban Water Supplier Conservation Compliance Dataset and June 2014 - December 2015 Urban Water Supplier Report Dataset:
http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.shtml

**Table 3-1**
**Current and Historical Potable Water Demand and Population**
City of Burlingame, California

| Year | Potable Water Demand (MG) (a) | Service Area Population (b) | Per Capita Potable Water Use (GPCD) (c) |
|---|---|---|---|
| 2005 | 1,650 | 27,881 | 162 |
| 2006 | 1,588 | 28,187 | 154 |
| 2007 | 1,653 | 28,525 | 159 |
| 2008 | 1,643 | 28,833 | 156 |
| 2009 | 1,562 | 29,142 | 147 |
| 2010 | 1,437 | 29,450 | 134 |
| 2011 | 1,467 | 29,782 | 135 |
| 2012 | 1,521 | 30,114 | 138 |
| 2013 | 1,520 | 30,445 | 137 |
| 2014 | 1,497 | 30,777 | 133 |
| 2015 | 1,283 | 31,109 | 113 |

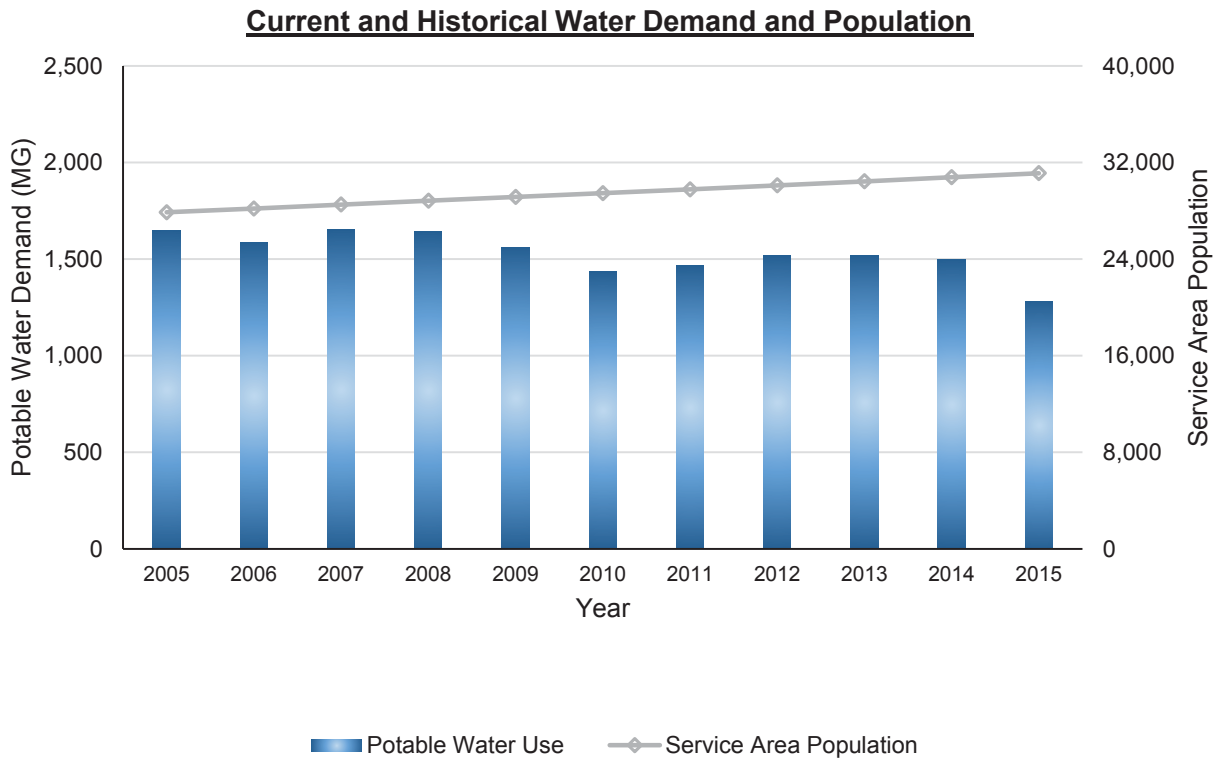
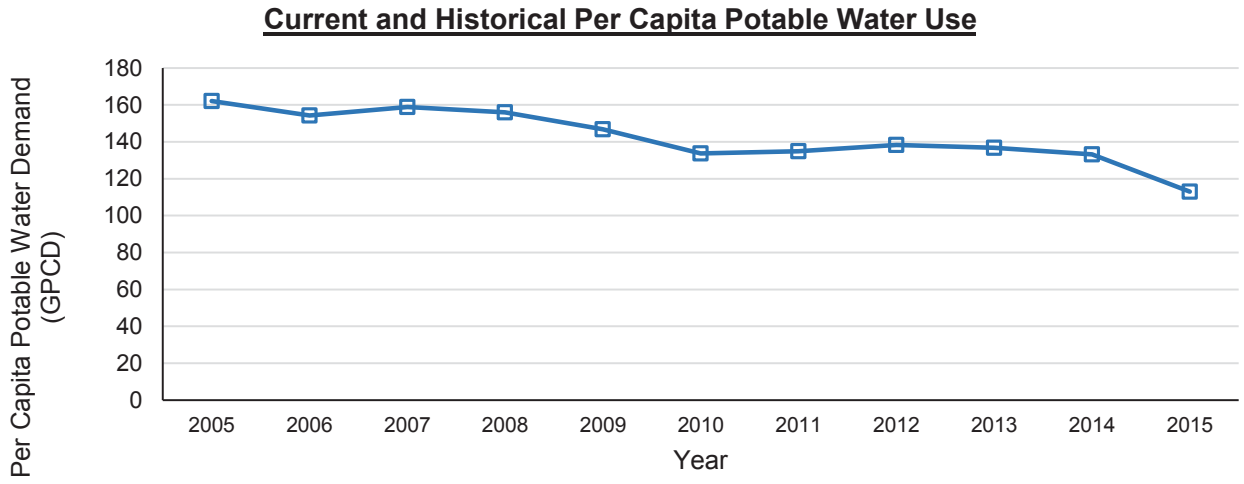


**Table 3-1 (Continued)**
**Current and Historical Potable Water Demand and Population**
City of Burlingame, California




Abbreviations:
"DWR" = California Department of Water Resources
"GPCD" = gallons per capita per day
"MG" = million gallons
"SFPUC" = San Francisco Public Utilities Commission

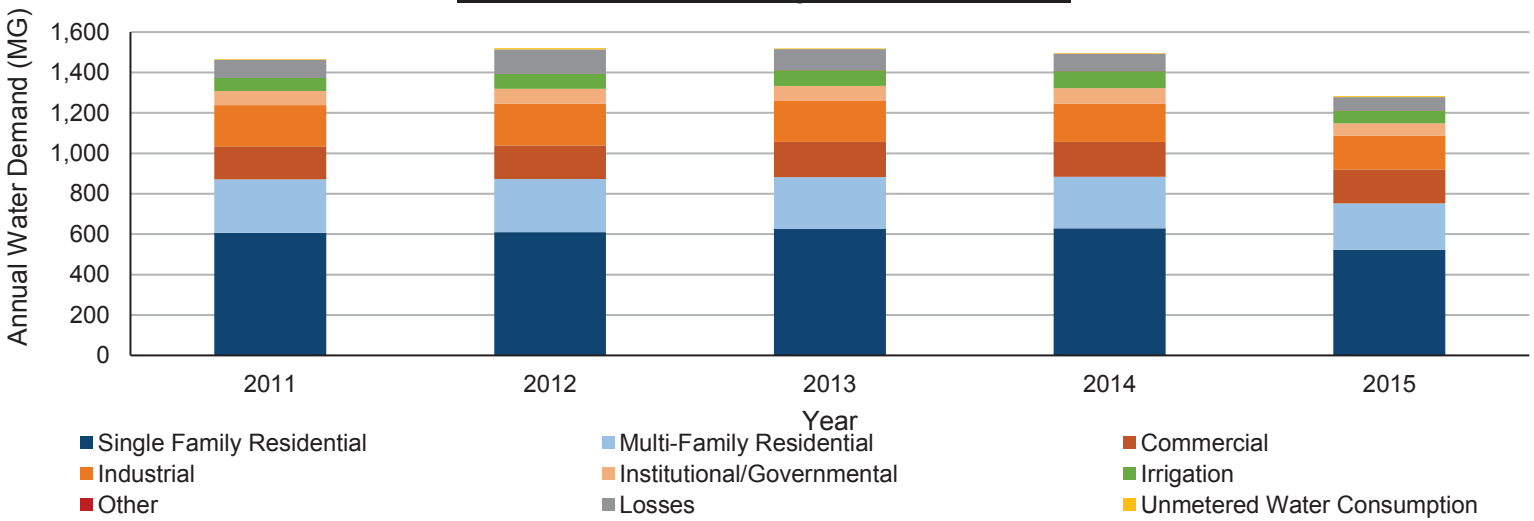
Notes:
(a) Detailed historical and current water demand data from 2011 through 2015 are documented in Table 3-2. Demands are based on purchases from SFPUC, on a fiscal year basis.
(b) Service area population data from 2005 through 2010 are from Table 4-1. Service area population was estimated using the DWR Population Tool, which is based on Census population data and the Burlingame service area boundary.
(c) Per capita potable water use is calculated by dividing the total annual potable water demand by the service area population and the number of days in a year.

**Table 3-2**
**Current and Historical Potable Water Demand by Sector (DWR Table 4-1)**
City of Burlingame, California

| Water Use Sector | Potable Water Demand (MG) (a) | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2011 | 2012 | 2013 | 2014 | 2015 | Average | |
| *Residential Water Use* | | | | | | | |
| Single Family Residential | 606 | 610 | 625 | 629 | 523 | 599 | 41% |
| Multi-Family Residential | 265 | 263 | 257 | 255 | 230 | 254 | 17% |
| *Subtotal Residential* | *871* | *873* | *882* | *884* | *753* | *853* | *59%* |
| *CII Water Use* | | | | | | | |
| Commercial | 163 | 166 | 175 | 172 | 167 | 169 | 12% |
| Industrial | 204 | 206 | 202 | 190 | 167 | 194 | 13% |
| Institutional/Governmental | 70 | 74 | 74 | 77 | 62 | 71 | 5% |
| *Subtotal CII* | *437* | *447* | *451* | *439* | *396* | *434* | *30%* |
| *Other Water Use* | | | | | | | |
| Irrigation (b) | 65 | 74 | 77 | 84 | 63 | 73 | 5% |
| Other (c) | 0.2 | 0.2 | 0.3 | 0.2 | 0.7 | 0.3 | 0.02% |
| *Subtotal Other* | *65* | *74* | *78* | *84* | *63* | *73* | *5%* |
| **Metered Water Use** | **1,373** | **1,394** | **1,411** | **1,407** | **1,212** | **1,359** | **93%** |
| *Non-Revenue Water (d)* | | | | | | | |
| Unmetered Water Consumption | 4 | 6 | 4 | 3 | 4 | 4 | 0.3% |
| Losses | 90 | 121 | 104 | 87 | 66 | 94 | 6% |
| *Subtotal Non-Revenue Water* | *94* | *128* | *108* | *90* | *71* | *98* | *7%* |
| **Total Water Demand (d)** | **1,467** | **1,521** | **1,520** | **1,497** | **1,283** | **1,458** | **100%** |

**Table 3-2 (Continued)**
**Current and Historical Potable Water Demand by Sector (DWR Table 4-1)**
City of Burlingame, California

**Annual Water Demand by Sector: 2011-2015**




**Percentage of Total Water Demand by Sector: 2011-2015**

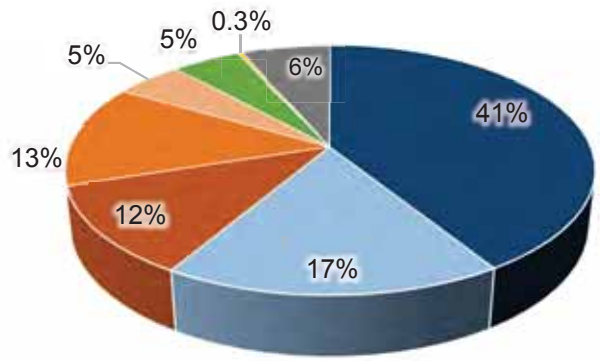


**Table 3-2 (Continued)**
**Current and Historical Potable Water Demand by Sector (DWR Table 4-1)**
City of Burlingame, California

Abbreviations:
"CII" = commercial, industrial, and institutional
"DWR" = California Department of Water Resources
"MG" = million gallons
"SFPUC" = San Francisco Public Utilities Commission

Notes:
(a) Water demand was obtained from the City of Burlingame "Monthly Water Consumption Reports" and are based upon metered water consumption.
(b) Irrigation water use includes water use recorded at irrigation meters at accounts that are sub-metered and does not represent all
(c) Other water use includes water used for fire services.
(d) Unmetered water consumption and losses were estimated for using the DWR Water Audit Method. Totals may not sum due to rounding.

moderate commercial, industrial, and institutional (CII) base, which together accounted for approximately 30% of potable water demand for the 2011-2015 period. The commercial and industrial sectors accounted for 12% and 13% of the total Burlingame water demand, respectively, while the institutional/ governmental sector accounted for 5% of the total water demand. On average, irrigation and fire services respectively accounted for 5% and 0.02% of the total water demand. Irrigation services include irrigation water use at accounts that have a separate irrigation meter and does not represent all of the outdoor irrigation water use within Burlingame.

### 3.1.2 Current and Historical Non-Potable Water Demand

Approximately 0.30 MGD of recycled water demand is produced and used internally by the Burlingame WWTP. Burlingame does not have a recycled water distribution system that serves recycled water outside of the WWTP.

### 3.1.3 Distribution System Water Loss

*10631. (e) (3) (A) For the 2015 urban water management plan update, the distribution system water loss shall be quantified for the most recent 12-month period available. For all subsequent updates, the distribution system water loss shall be quantified for each of the five years preceding the plan update.*

*10631. (e) (3) (B) The distribution system water loss quantification shall be reported in accordance with a worksheet approved or developed by the department through a public process. The water loss quantification worksheet shall be based on the water system balance methodology developed by the American Water Works Association.*

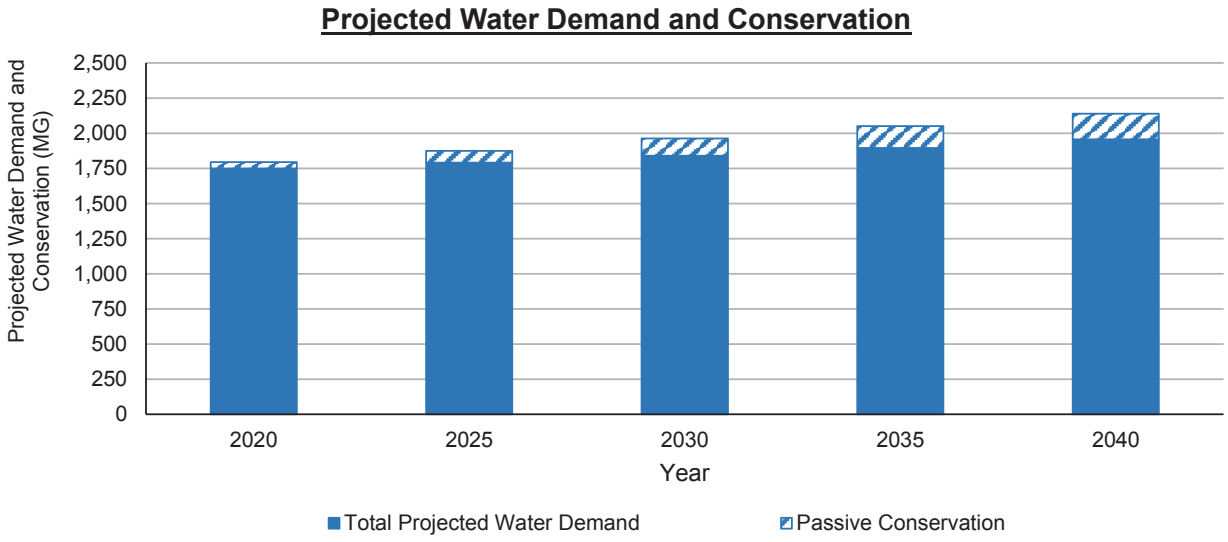
Distribution system water losses are the physical water losses from the water distribution system and the supplier storage facilities, up to the point of customer consumption. Water losses for 2015 within the Burlingame service area were estimated using the Department of Water Resources (DWR) Water Audit Method. As shown in Table 3-2, of the total demand of 1,283 MG in 2015, 1,212 MG were attributable to metered consumption, 4 MG were estimated to be from unmetered consumption, and 66 MG were estimated to be from distribution system water loss (see Appendix A, DWR Table 4-4). Non-revenue water demand for 2011 through 2015 averaged 7%. Metering of Burlingame's distribution system is further discussed in Section 8.2.2.

## 3.2 PROJECTED TOTAL WATER DEMAND

Per CWC Section 10631(e)(1), potable and non-potable water demand projections are discussed in the following sections.

**Table 3-3**
**Projected Potable Water Demand**
City of Burlingame, California

| | Projected Potable Water Demand (MG) (a) | | | | |
|---|---|---|---|---|---|
| | **2020** | **2025** | **2030** | **2035** | **2040** |
| Projected Water Demand | 1,795 | 1,875 | 1,963 | 2,051 | 2,138 |
| Projected Water Conservation | | | | | |
| Passive Conservation | (45) | (85) | (124) | (156) | (182) |
| Active Conservation | (22) | (34) | (64) | (115) | (116) |
| | | | | | |
| Projected Water Demand after Passive Conservation Savings | *1,749* | *1,790* | *1,839* | *1,895* | *1,956* |
| | | | | | |
| Projected Water Demand after Passive and Active Conservation Savings | *1,727* | *1,756* | *1,775* | *1,780* | *1,841* |
| | | | | | |
| **Total Projected Water Demand (b)** | **1,749** | **1,790** | **1,839** | **1,895** | **1,956** |




Abbreviations:
"DSS Model" = Demand Management Decision Support System Model
"MG" = million gallons

Notes:
(a) Projected water demands and conservation were estimated using the updated DSS Model, provided by Maddaus Water Management Inc. February 2016.
(b) Total water demand is the sum of metered water consumption and losses. The projected water demands include anticipated savings from plumbing codes. For planning purposes, savings from anticipated active water conservation programs are not included.

### 3.2.1 Projected Potable Water Demand

Future potable water demands within the Burlingame service area are estimated as the projected water demands associated with population and employment growth within the Burlingame service area. The demand estimation methodology and associated demand estimates are described below, and presented in Table 3-3 in five-year increments from 2020 through 2040.

In 2014, future water demands for the Burlingame service area were projected by Bay Area Water Supply and Conservation Agency (BAWSCA) on behalf of Burlingame in the *Regional Water Demand and Conservation Projections Report* (BAWSCA, 2014). Future water demands were projected using the Demand Management Decision Support System Model (DSS Model)[7] and were based on population and employment projections within Burlingame's service area, which were in turn developed using Association of Bay Area Governments (ABAG) 2009 and 2013 population and employment projection data.

A detailed description of the DSS Model and the associated water demand and conservation projection methodology is provided in the *Regional Water Demand and Conservation Projections Report* (BAWSCA, 2014). A brief description of BAWSCA's 2014 demand projections is provided below.

> In September 2014, BAWSCA completed the Regional Water Demand and Conservation Projections Report (Demand Study). The goal of the Demand Study was to develop transparent, defensible, and uniform demand and conservation savings projections for each wholesale customer using a common methodology to support both regional and individual agency planning efforts. The Demand Study projections were incorporated into BAWSCA's Long-Term Reliable Water Supply Strategy (Strategy) discussed below.
>
> Through the Demand Study process, BAWSCA and the wholesale customers (1) quantified the total average-year water demand for each BAWSCA member agency through 2030, (2) quantified passive and active conservation water savings potential for each individual wholesale customer through 2040, and (3) identified conservation programs for further consideration for regional implementation by BAWSCA. The Demand Study projected that by 2040 the collective active conservation efforts of the wholesale customer's would yield an additional 16 MGD in savings beyond what has already been achieved for the BAWSCA service area. Based on the revised water demand projections, the identified water conservation savings, and other actions, the collective purchases of the BAWSCA member agencies from the SFPUC are projected to stay below 184 MGD through 2018.
>
> As part of the Demand Study, each wholesale customer was provided with a demand model that can be used to support ongoing demand and conservation planning efforts, including UWMP preparation.

[7] The DSS model was provided to Burlingame by Maddaus Water Management Inc. in February 2016, as a modified version of the model provided in 2014.

In 2016, as part of the 2015 UWMP update, Burlingame's DSS Model was revised to account for changes since the demand projections were estimated by BAWSCA. The 2016 DSS Model update included the revised population and employment projections, which took into account growth rates projected by ABAG and updated estimates of past population and (Section 2.12.1.1).

The total projected potable water demand in the Burlingame service area, accounting for projected passive conservation savings, is estimated to be 1,956 in 2040, as shown in Table 3-3 and the associated chart. Projected water savings associated with passive conservation (182 MG in 2040) are also identified in Table 3-3.

The Burlingame service area has experienced a significant reduction in water use, even before the current drought period, with per capita demands dropping 16% from 2007 to 2013 (Table 3-1). It is possible that a portion of the Burlingame service area may be "demand-hardened," meaning that additional water savings due to passive or active conservation may not be possible; although, the degree of this demand hardening is not known. If significant demand hardening is experienced in the Burlingame service area, then active conservation measures in the future may not result in as much water savings as anticipated. Therefore, as a conservative approach, active conservation programs are not included in the projected water demands used for planning purposes and in comparisons to available supply (Section 6).

As above, it is estimated that the potable water demand will be approximately 1,956 MG in 2040 within the Burlingame service area, which is a 52% increase relative to the actual 2015 water demand of 1,283 MG. Over the same period, population is estimated to increase by 27% and jobs are expected to increase by approximately 30% in the Burlingame service area. Total projected potable water demand for each water use sector within the Burlingame service area is shown in five-year increments through 2040 in Table 3-4 and the associated chart.

### 3.2.2 Projected Non-Potable Water Demand

The City does not currently supply non-potable water to customers outside of the Burlingame WWTP and does not currently have plans to distribute recycled water to additional customers (see Appendix A, DWR Table 4-3).

### 3.2.3 Water Use for Lower Income Households

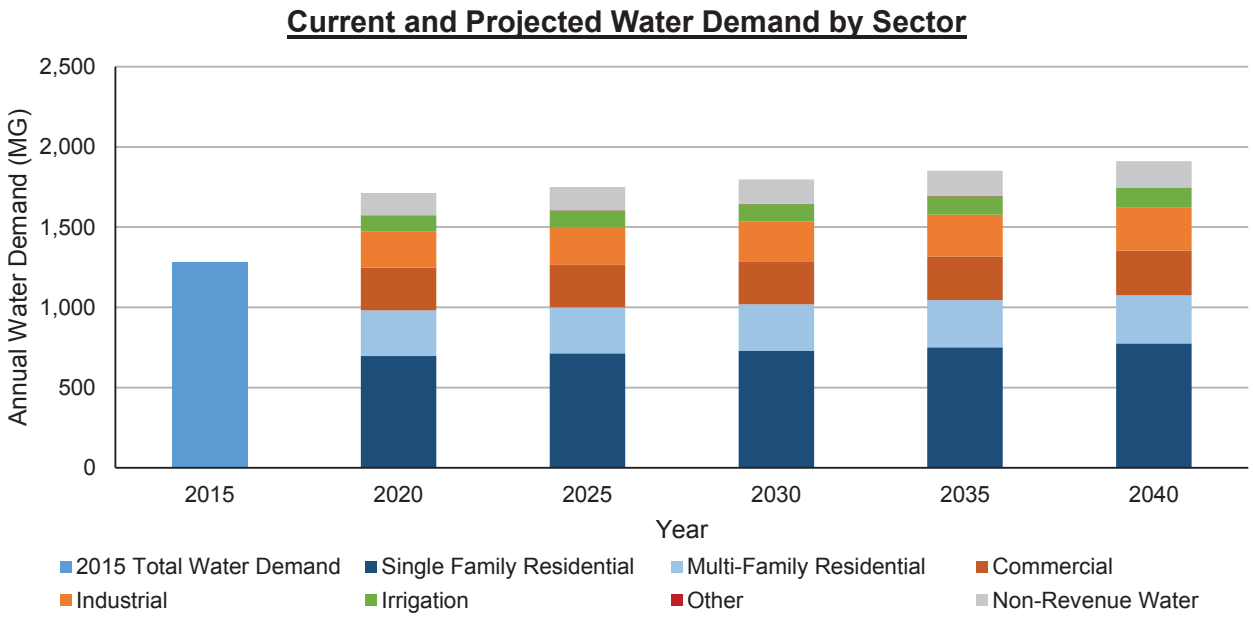
*10631.1 (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.*

The potable water demands presented in Section 3.2.1 include projected future water use by lower income households. Per Health and Safety Code 50079.5, a lower income household is defined as a household with lower than 80% of the area's median income.

The projected low income water use was based on the projected number of needed very low income units for 2015-2023 identified in the Housing Element (City of Burlingame, 2015). The Housing Element projected a need of 2,783 extremely and very low income units by 2020, or

**Table 3-4**
**Projected Potable Water Demand by Sector (DWR Table 4-2)**
City of Burlingame, California

| Water Use Sector | Projected Potable Water Demand (MG) | | | | |
|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 |
| *Projected Residential Water Demand* | | | | | |
| Single Family Residential | 696 | 713 | 730 | 751 | 775 |
| Multi-Family Residential | 284 | 286 | 289 | 294 | 301 |
| *Subtotal Residential* | *981* | *1,000* | *1,019* | *1,045* | *1,076* |
| *Projected CII Water Demand* | | | | | |
| Commercial | 267 | 264 | 268 | 273 | 277 |
| Institutional | 37 | 39 | 41 | 43 | 45 |
| Industrial | 227 | 238 | 249 | 260 | 271 |
| *Subtotal CII* | *531* | *541* | *558* | *576* | *594* |
| *Projected Other Water Demand* | | | | | |
| Irrigation (a) | 97 | 103 | 108 | 114 | 119 |
| Other (b) | 2 | 2 | 2 | 2 | 3 |
| *Subtotal Other* | *100* | *105* | *111* | *116* | *122* |
| *Subtotal Projected Water Demand* | **1,611** | **1,646** | **1,687** | **1,737** | **1,792** |
| Non-Revenue Water | 138 | 144 | 151 | 158 | 165 |
| **Total Projected Water Demand (c)** | **1,749** | **1,790** | **1,839** | **1,895** | **1,956** |




Abbreviations:
"CII" = commercial, industrial, and institutional
"DWR" = California Department of Water Resources
"MG" = million gallons

Notes:
(a) Irrigation water use includes water use recorded at irrigation meters at accounts that are sub-metered and does not represent all of the outdoor irrigation water use within the Burlingame service area.
(b) Other water use includes water used for fire services.
(c) Total water demand is the sum of metered water consumption and non-revenue water. The projected water demands include anticipated savings from plumbing codes.

**Table 3-5**
**Projected Potable Water Demand of Lower-Income Households**
City of Burlingame, California

| Lower-Income Water Demand Sector | Projected Potable Water Demand (MG) (a) | | | | |
|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 |
| Single Family Residential | 139 | 143 | 146 | 150 | 155 |
| Multi-Family Residential | 57 | 57 | 58 | 59 | 60 |

Notes:
(a) Projected potable water demand for lower income households was estimated as a percentage of the residential demand listed in Table 3-4. The percentage is based on the number of lower income household, compared to total households within Burlingame per Reference 1.

References:
(1) City of Burlingame, 2015. *2015-2023 Housing Element,* adopted 5 January 2015, Resolution 5-2015.

approximately 20% of households. It is therefore assumed that approximately 20% of single family and multi-family residential water demands within Burlingame's service area will be associated with lower income households. Table 3-5 contains the estimated future water use for lower income households. These demands were included in the total potable water demand projections described above and shown in Table 3-4 (see also Appendix A, DWR Table 4-5).

### 3.2.4 Water Savings from Codes, Standards, Ordinances, or Transportation and Land Use Plans

> *10631. (4) (A) If available and applicable to an urban water supplier, water use projections may display and account for the water savings estimated to result from adopted codes, standards, ordinances, or transportation and land use plans identified by the urban water supplier, as applicable to the service area.*

"Passive conservation" refers to water savings resulting from actions and activities that do not depend on direct financial assistance or educational programs implemented by water suppliers. These savings result primarily from: (1) the natural replacement of existing plumbing fixtures with water-efficient models required under current plumbing code standards,[8] and (2) the installation of water-efficient fixtures and equipment in new buildings and retrofits as required under CALGreen Building Code Standards.[9]

Burlingame also requires that new and rehabilitated landscapes on projects subject to city review and approval comply with the City of Burlingame's Water Conservation in Landscape Ordinance (Chapter 18.17.010 of the Burlingame Municipal Code, Ordinance 1845-2010), which was adopted in March 2010. Water savings associated with inclusion of low-water use landscaping and high-efficiency irrigation systems to minimize outdoor water use in accordance with the Water Conservation in Landscaping Ordinance are included in the water demand estimates for new connections and projects.

"Active conservation" refers to water savings resulting from Burlingame's implementation of water conservation programs, education programs, and the offering of financial incentives (e.g., rebates). Burlingame's current and planned active conservation programs are discussed in Section 7.

The potable water demand projections discussed in Section 3.2.1 take into account passive conservation savings, as shown in Table 3-3 and the associated chart (see also Appendix A, DWR Table 4-5). Additional water savings are expected due to Burlingame's active conservation efforts; however, for conservative planning purposes these conservation savings are not included in the total potable water demand projections. As can be seen in Table 3-3, by 2040, it is estimated that passive conservation savings will reduce total projected water demand

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[8] Including the California Energy Commission Title 20 appliance standards for toilets, urinals, faucets, and showerheads. The appliance standards determine what can be sold in California and therefore will impact both new construction and replacement fixtures in existing homes.

[9] The City requires that all new residential and non-residential construction comply with the mandatory CALGreen Requirements (Chapter 18.30 of the Burlingame Municipal Code, Ordinance 1857-2010, adopted in 2010).

by 182 MG within the Burlingame service area (i.e., the total 2040 demand will be reduced from 2,138 MG to 1,956 MG). An additional 116 MG of water savings may be achieved through active conservation.

## 3.3 WATER USE SECTORS NOT INCLUDED IN THE DEMAND PROJECTIONS

Historical and projected water demands for the water use sectors described in CWC Section 10631(e)(1)(G) through (I) and listed below were not included in Burlingame's water demand calculations because they are not applicable to the City:

- Sales to other agencies;
- Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and
- Agricultural.

### 3.3.1 Sales to Other Agencies

Metered interties exist between the Burlingame water system and the City of Millbrae and the Town of Hillsborough water system. Burlingame has served (sold) water to Millbrae in the past through the intertie. The City also has unmetered interties with the California Water Service Company along the southern portion of the distribution system. However, water sales are not included in Burlingame's water demand estimate because, although Burlingame does have an understanding with Millbrae that it can buy or sell water in emergency situations or pursuant to project-specific agreements, Burlingame does not sell water under normal operating conditions.

### 3.3.2 Saline Water Intrusion Barriers, Groundwater Recharge, and Conjunctive Use

Burlingame does not use water for saline water intrusion barriers and does not currently participate in active groundwater recharge activities or a conjunctive use program.

### 3.3.3 Agricultural

Burlingame does not sell water to agricultural customers and does not expect to in the future.

## 3.4 COORDINATING WATER USE PROJECTIONS

> *10631. (j) An urban water supplier that relies upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available.*

Burlingame provides the SFPUC with water use projections annually as part of reporting to the BAWSCA Annual Surveys and other BAWSCA-led water demand and supply coordination efforts as dictated by the 2009 Water Supply Agreement. As part of the coordination effort for the 2015 UWMP, and in compliance with CWC Section 10631(j), Burlingame supplied BAWSCA with its water demand projections through 2040 for transmittal to the SFPUC.[10]

[10] Email to BAWSCA, dated 27 April 2016.

# 4. BASELINE WATER USE AND WATER CONSERVATION TARGETS

The Water Conservation Act of 2009 (Water Conservation Act) directed the Department of Water Resources (DWR) to develop technical methodologies and criteria to ensure the consistent implementation of the Water Conservation Act and to provide guidance to urban retail water suppliers in developing baseline and compliance water use. The Water Conservation Act was incorporated into Division 6 of the California Water Code (CWC) commencing with Section 10608 of Part 2.55. The methodologies for developing baseline and compliance water use are established in *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water, California Department of Water Resources Division of Statewide Integrated Water Management Water Use and Efficiency Branch*, March 2016 update (Methodologies; DWR, 2016b)

The Water Conservation Act specifically calls for developing seven methodologies and a set of criteria for adjusting daily per capita water use at the time compliance is required (the 2015 and 2020 compliance years) under CWC Section 10608.20(h):

> *1. The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:*
> *A. Methodologies for calculating base daily per capita water use, baseline commercial industrial, and institutional water use, compliance daily per capital water use, gross water use, service area population, indoor residential water use, and landscaped area water use.*
> *B. Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.*

The CWC Sections 10608.20 and 10608.28 allow water suppliers the choice of complying individually or regionally by mutual agreement with other water suppliers or regional agencies. The DWR has also developed a methodology for regional compliance. The following calculation methodologies have been developed and are described in Methodologies (DWR, 2016b):

- Methodology 1: Gross Water Use
- Methodology 2: Service Area Population
- Methodology 3: Base Daily Per Capita Water Use
- Methodology 4: Compliance Daily Per Capita Water Use
- Methodology 5: Indoor Residential Use
- Methodology 6: Landscaped Area Water Use
- Methodology 7: Baseline Commercial, Industrial, and Institutional Water Use
- Methodology 8: Criteria for Adjustments to Compliance Daily Per Capita Water Use
- Methodology 9: Regional Compliance

Baselines and water use targets for the City of Burlingame (City or Burlingame) service area were presented in the 2010 Urban Water Management Plan (UWMP) in response to the Water Conservation Act. Per requirements of the DWR described in Section 4.1, the 2015 UWMP includes an update to the baseline and water use target calculations using 2010 United States Census (Census) data and analyzes Burlingame's compliance with its 2015 interim water use

target. Water use targets and 2015 compliance data are summarized in Tables 4-1 through 4-3. Detailed calculations are included in Appendix E.

## 4.1 SERVICE AREA POPULATION

*10608.20 (e) An urban retail water supplier shall include in its urban water management plan due in 2010 pursuant to Part 2.6 (commencing with Section 10610) the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.*
*10608.20 (g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).*
*Methodology 2 Service Area Population. DWR will examine discrepancy between the actual population estimate and DOF's projections for 2010; if significant discrepancies are discovered, DWR may require some or all suppliers to update their baseline population estimates. (DWR, 2016b)*

Burlingame estimated its service area population for baseline periods spanning from 1996 through 2007 in the 2010 UWMP. Per the Methodologies, DWR examined the actual population estimates and the Department of Finance's (DOF's) projections for 2010, and is requiring that water suppliers recalculate their baseline population for the 2015 UWMPs using 2000 and 2010 Census data if a water supplier did not use 2010 Census data for its baseline population calculations in the 2010 UWMP. Burlingame is subject to this requirement, as the full 2010 Census data set was not available until 2012, while Burlingame submitted its 2010 UWMP update in 2011. As a result, Burlingame must modify its baseline and target gallons per capita per day (GPCD) values in this UWMP.

In 2010, the population for the Burlingame service area was estimated using Department of Finance (DOF) data and the City's 2010 Housing Element; the estimated population was 30,282. For the purposes of the 2015 UWMP, DWR's Population Tool was used to estimate historical population through 2015. The DWR Population Tool provides population estimates based on Census data, the number of service connections provided by Burlingame, and the geographic boundary of the Burlingame service area. The revised 2010 service area population is 31,109, as shown in Table 2-1. The Burlingame service area historical population values, as provided by the DWR Population Tool, for the baseline years are shown in Table 4-1 and are 1% to 8% lower than the historical population values used in the 2010 UWMP.

Using the DWR Population Tool, the 2015 population for the Burlingame service area is estimated to be 31,109.

## 4.2 BASELINE WATER USE

To update the per capita water use calculations per DWR requirements, Burlingame used the revised population estimates described in Section 4.1 and the historical potable water demand information presented in the 2010 UWMP.

**Table 4-1**
**SBx7-7 Service Area Population (DWR SBx7-7 Table 3)**
City of Burlingame, California

| Year | | Population (a) |
|---|---|---|
| *10 to 15 Year Baseline Population* | | |
| Year 1 | 1996 | 28,214 |
| Year 2 | 1997 | 28,379 |
| Year 3 | 1998 | 28,544 |
| Year 4 | 1999 | 28,711 |
| Year 5 | 2000 | 28,900 |
| Year 6 | 2001 | 28,032 |
| Year 7 | 2002 | 26,868 |
| Year 8 | 2003 | 27,187 |
| Year 9 | 2004 | 27,521 |
| Year 10 | 2005 | 27,881 |
| *5 Year Baseline Population* | | |
| Year 1 | 2003 | 27,187 |
| Year 2 | 2004 | 27,521 |
| Year 3 | 2005 | 27,881 |
| Year 4 | 2006 | 28,187 |
| Year 5 | 2007 | 28,525 |
| *2015 Compliance Year Population* | | |
| 2015 | | 31,109 |

Abbreviations:
"DWR" = California Department of Water Resources
"GIS" = Geographic Information System
"SBx7-7" = Senate Bill x7-7

Notes:
(a) Service area population presented herein is estimated using the DWR Population Tool based on service area GIS data and number of water service connections data provided by the City of Burlingame.

Water suppliers must define a 10- or 15-year base (or baseline) period for water use that is then used to develop their future target per capita water use. Water suppliers must also calculate water use over a 5-year baseline period and use that value to determine a minimum required reduction in water use by 2020. Utilizing a 15-year baseline period is only allowed for water suppliers that meet at least 10% of their 2008 measured retail water demand through recycled water; Burlingame does not meet this criterion and thus selected a 10-year baseline.

The 10-year baseline water use was calculated using gross per capita water usage data (calculated as total water entering the Burlingame water distribution system, including uses by commercial, industrial, and other users, as well as water loses, divided by total population) for the 10-year period between 1 July 1995 and 30 June 2005. The 5-year baseline water use was calculated using per capita water usage data for the 5-year period between 1 July 2002 and 30 June 2007. The updated 5- and 10-year baseline water uses are shown in Table 4-2 and in Appendix E.

**Table 4-2**
**SBx7-7 Baselines and Targets (DWR Table 5-1) (a)**
City of Burlingame, California

| Baseline Period | Baseline Years | | Average GPCD | SBx7-7 Targets | |
|---|---|---|---|---|---|
| | Start Year | End Year | | 2015 Interim | Confirmed 2020 |
| 10-15 Year | 1996 | 2005 | 169 | 152 | 135 |
| 5-Year | 2003 | 2007 | 165 | | |

Abbreviations:
"DWR" = California Department of Water Resources
"GPCD" = gallons per capita per day
"SBx7-7" = Senate Bill x7-7

Notes:
(a) This table is based on information provided in Appendix E, SBx7-7 Tables 1, 5, 7-A, 7-F, and 8.

## 4.3 WATER USE TARGETS

*10608.20 (b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):*

*(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.*
*(2) The per capita daily water use that is estimated using the sum of the following performance standards: (A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute. (B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas. (C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.*
*(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.*
*(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following: (A) Consider climatic differences within the state. (B) Consider population density differences within the state. (C) Provide flexibility to communities and regions in meeting the targets. (D) Consider different levels of per capita water use according to plant water needs in different regions. (E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state. (F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.*

*10608.22. Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.*

Water use targets were calculated in Burlingame's 2010 UWMP and are updated below based on the revised population estimates.

The Water Conservation Act requires that agencies calculate their 2020 water use targets (Targets) using one of the following four methods:

- Method 1: Eighty percent of the water supplier's baseline per capita water use;
- Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use, landscaped area water use, and commercial, industrial, and institutional uses;
- Method 3: Ninety-five percent of the applicable state hydrologic region target as stated in the State's 20x2020 Water Conservation Plan, dated February 2010; or
- Method 4: Total savings subtracted from baseline water use. Savings include metering savings, residential savings, commercial, industrial, and institutional savings, and landscape and water loss savings.

The 2020 Target may need to be adjusted further to achieve a minimum reduction in water use regardless of the target method (this is explained in Methodology 3). The CWC Section 10608.24 directs that water suppliers must compare their actual water use in 2020 with their calculated Target to assess compliance. In addition, water suppliers must comply with an "Interim Target" in 2015 which is established as the midpoint between the baseline water use and the 2020 Target. The years 2015 and 2020 are referred to in the Methodologies as compliance years.

Burlingame's 2020 Target was calculated using Method 4 in 2010.[11] Using the updated service area population listed in Table 4-1, the 2020 Target is recalculated using Method 1 and updated population values as 135 GPCD, as shown in Table 4-2. The 2015 Interim Target is calculated as 152 GPCD, which is the mid-point between the 10-year baseline and the 2020 Target. Complete Target calculations are included in Appendix E.

The Water Conservation Act also contains a minimum allowable cutback in per capita water consumption. This minimum water use cutback is calculated as 95% of the Burlingame average water consumption between 2006 and 2010 (i.e., the 5-year baseline). The 5-year baseline water use is calculated as 165 GPCD; 95% of this is 157 GPCD (see Table 4-2 and Appendix E). Since the 2020 Target of 135 GPCD is less than 95% of the 5-year baseline, the selected 2020 Target meets the compliance criteria.

[11] The 2020 Target calculated in the 2010 UWMP using Method 4 was 133 GPCD, using the same baseline periods.

## 4.4 2015 TARGET COMPLIANCE

*10608.24 (a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.*
*10608.24 (d) (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:*

- *(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.*
- *(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.*
- *(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.*

*(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.*
*10608.40. Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.*

The CWC Section 10608.24 (a) directs that water suppliers must calculate their actual water use in 2015 to determine whether or not they have met their 2015 Interim Target and to assess their progress toward meeting their 2020 Target. Per the Methodologies (DWR, 2016b), there are several allowable adjustments that can be made to a supplier's 2015 per capita water use calculations as part of evaluating target compliance. However, no adjustments were made to Burlingame's 2015 per capita water use calculations.

As above, in 2015, actual water demand within the Burlingame service area was 1,283 million gallons (MG) and the service area population was 31,109. Therefore, the calculated per capita water use in 2015 was 113 GPCD, approximately 72% of Burlingame's 2015 Interim Target of 152 GPCD (Table 4-3). Therefore, Burlingame is in compliance with its 2015 Interim Target.

## 4.5 WATER USE REDUCTION PLAN

The actual water demand within the Burlingame service area in Fiscal Year (FY) 2014-15 was well below the 2015 Interim Target. This is both due to water use cutbacks achieved during the recent drought and the conservation efforts that the Burlingame has supported during the past five years to reduce water use (see Section 8.3).

Between 2016 and 2020, a rebound in per capita water use is expected within the Burlingame service area if the severity of the current drought subsides and the anticipated growth in population and employment is realized. Per capita water use within the Burlingame service area is projected to be approximately 146 GPCD by 2020; this estimate is based on the population projections described in Section 4.1 and the future water demand projections described in

**Table 4-3**
**2015 SBx7-7 Compliance (DWR Table 5-2) (a)**
City of Burlingame, California

| Actual and Interim Target GPCD | | | |
|---|---|---|---|
| **2015 Actual GPCD** | | **2015 Interim Target** | |
| 113 | | 152 | |
| **Optional Adjustments to 2015 GPCD** | | | |
| **Extraordinary Events** | **Economic Adjustment** | **Weather Normalization** | **Adjusted Actual 2015 GPCD** |
| 0 | 0 | 0 | 113 |
| **SBx7-7 Compliance** | | | |
| **Actual (or Adjusted Actual) 2015 GPCD as Percent of Target** | | **In Compliance? (y/n)** | |
| 74.4% | | YES | |

Abbreviations:
"DWR" = California Department of Water Resources
"GPCD" = gallons per capita per day
"SBx7-7" = Senate Bill x7-7

Notes:
(a) This table is based on information contained in Appendix E, SBx7-7 Tables 5, 8, and 9.

Section 3.2. As such, based on the current anticipated growth within the Burlingame service area, and planned implementation of water conservation programs, Burlingame may not achieve compliance with its 2020 Target of 135 GPCD.

The City will continue to actively manage its per capita water use through implementation of demand management measures as discussed in Section 8.4. To the extent that Burlingame develops additional recycled water supplies or individual development projects implement on-site water recycling, as discussed in detail in Section 5, the projected future potable demands in 2040 are likely to be further reduced beyond the conservative estimates presented herein.

# 5. WATER SYSTEM SUPPLIES

*10631. A plan shall be adopted in accordance with this chapter and shall do all of the following: 10631. (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).*

The City of Burlingame (City or Burlingame) purchases all of its potable water from the San Francisco Public Utilities Commission (SFPUC or Commission) Regional Water System (RWS) in accordance with the 2009 Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda, San Mateo and Santa Clara Counties, approved by the Commission on 28 April 2009.

To maintain consistency with the Urban Water Management Plans (UWMPs) prepared by the SFPUC and the other Bay Area Water Supply and Conservation Agency (BAWSCA) member agencies, much of the language describing the SFPUC wholesale water supply in the following sections is common language provided by BAWSCA, in coordination with the SFPUC.

## 5.1 SFPUC WHOLESALE WATER

This section describes the sources of wholesale water provided by SFPUC, and the process for allocating water between SFPUC, BAWSCA, and wholesale customers.

### 5.1.1 Description of Wholesale Water Supply

Approximately 85% of the water supply to the SFPUC RWS originates in the Hetch Hetchy watershed, located in Yosemite National Park, and flows down the Tuolumne River into the Hetch Hetchy Reservoir. Water from the Hetch Hetchy watershed is managed through the Hetch Hetchy Water and Power Project. The remaining 15% of the water supply to the SFPUC RWS originates locally in the Alameda and Peninsula watersheds and is stored in six different reservoirs in Alameda and San Mateo Counties. Details of the various components of the SFPUC RWS are provided below and are shown on Figure 5-1. Information regarding the Hetch Hetchy, Alameda, and Peninsula water systems is largely sourced from the SFPUC and BAWSCA websites and common language provided by BAWSCA.

> The RWS, shown in Figure 5-1, consists of more than 280 miles of pipeline and 60 miles of tunnels, 11 reservoirs, five pump stations, and two water treatment plants. It is geographically delineated between the Hetch Hetchy Project and the Bay Area water system facilities. The Hetch Hetchy Project is generally composed of the reservoirs, hydroelectric generation and transmission facilities, and water transmission facilities from the Hetch Hetchy Valley west to the Alameda East Portal of the Coast Range Tunnel in Sunol Valley. Water system components of the Hetch Hetchy Project are also referred to as the Hetch Hetchy System. The local Bay Area water system is comprised of two parts—the Alameda System and the Peninsula System—generally consisting of the facilities west of Alameda East Portal, including the 63,000-acre Alameda and Peninsula watersheds, storage reservoirs, two water

## Abbreviations

SFPUC = San Francisco Public Utilities Commission
SFO = San Francisco Airport

## Notes

1. All locations are approximate.
2. Not to scale.
3. Three pump stations on Treasure Island are not depicted.
4. The water service area of the SFPUC Regional Water System is approximate and for illustrative purposes only.

## Sources

SFPUC draft 2015 Urban Water Management Plan, in development.

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SFPUC Regional Water System

City of Burlingame
2015 Urban Water Management Plan
Burlingame, CA
June 2016
EKI A20031.30

Figure 5-1

Path: X:\A20031\Maps_30\2016\05\Fig5-1_Burlingame_SFPUC_RegionalWaterSystem.mxd

treatment plants, and the distribution system that delivers water to retail and wholesale customers.

#### 5.1.1.1 Hetch Hetchy Watershed and System

In the Hetch Hetchy System, water is diverted from Hetch Hetchy Reservoir into a series of tunnels and aqueducts from the Sierra Nevada to the San Joaquin Pipelines that cross the San Joaquin Valley to the Coast Range Tunnel, which connects to the Alameda System at the Alameda East Portal. Hetch Hetchy System water is disinfected at the Tesla Treatment Facility.

#### 5.1.1.2 Alameda Watershed and System

The Alameda System includes two reservoirs, San Antonio Reservoir and Calaveras Reservoir, which collect water from the San Antonio Creek, Upper Alameda Creek, and Arroyo Hondo watersheds in Alameda County. San Antonio Reservoir also receives water from the Hetch Hetchy System. Conveyance facilities in the Alameda System connect the Hetch Hetchy System and Alameda water sources to the Peninsula System. The BDPLs cross the South Bay to the Peninsula System delivering water to customers along the pipeline route. The Sunol Valley Water Treatment Plant (SVWTP) filters and disinfects water supplied from San Antonio Reservoir and Calaveras Reservoir.

#### 5.1.1.3 Peninsula Watershed and System

The Peninsula System includes conveyance facilities connecting the BDPLs to the in-City distribution system and to other customers on the Peninsula. Two reservoirs, Crystal Springs Reservoir and San Andreas Reservoir, collect runoff from the San Mateo Creek watershed. Crystal Springs Reservoir also receives water from the Hetch Hetchy System. A third reservoir, Pilarcitos Reservoir, collects runoff from the Pilarcitos Creek watershed and directly serves one of the Wholesale Customers, the Coastside County Water District (which includes the City of Half Moon Bay), along with delivering water to Crystal Springs and San Andreas Reservoirs. The Harry Tracy Water Treatment Plant (HTWTP) filters and disinfects water supplied from Crystal Springs Reservoir and San Andreas Reservoir before it is delivered to customers on the Peninsula and the in-City distribution system.

#### 5.1.1.4 Water Treatment

The Hetch Hetchy Reservoir is the largest unfiltered water supply on the West Coast, and one of only a few large unfiltered municipal water supplies in the nation. The water originates from spring snow melt flowing down the Tuolumne River to Hetch Hetchy Reservoir, where it is stored. This high-quality water source comes from well-protected wilderness areas in Yosemite National Park and meets or exceeds all federal and State criteria for watershed protection. Water from Hetch Hetchy Reservoir is protected in pipes and tunnels as it is conveyed to the Bay Area, and requires pH adjustment to control pipeline corrosion and disinfection for bacteria control. Based on the SFPUC's disinfection treatment practice, extensive bacteriological quality monitoring, and high operational standards, the U.S. Environmental Protection Agency (USEPA) and the SWRCB Division of Drinking Water

(DDW) determined that the Hetch Hetchy water source meets federal and State drinking water quality requirements without the need for filtration.

A new USEPA regulation took effect in 2012 requiring secondary disinfection for all unfiltered drinking water systems to control the waterborne parasite cryptosporidium. To comply with this regulation, the SFPUC completed construction of a new ultraviolet (UV) treatment facility in 2011. The Tesla Treatment Facility is a key component of the Water System Improvement Program (WSIP) and enhances the Hetch Hetchy System's high water quality. The facility has a capacity of 315 mgd, making it the third largest UV drinking water disinfection facility in the U.S.

All water derived from sources other than Hetch Hetchy Reservoir is treated at one of two treatment plants: the SVWTP or the HTWTP. The SVWTP primarily treats water from the Alameda System reservoirs and has both a peak capacity and sustainable capacity of 160 mgd. Treatment processes include coagulation, flocculation, sedimentation, filtration, and disinfection. Fluoridation, chloramination, and corrosion control treatment are provided for the combined Hetch Hetchy System and SVWTP water at the Sunol chloramination and fluoridation facilities. The HTWTP treats water from the Peninsula System reservoirs and has a peak capacity of 180 mgd and a sustainable capacity of 140 mgd. Treatment processes include ozonation, coagulation, flocculation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination. Major upgrades to the SVWTP were completed in 2013 and to the HTWTP in 2015.

#### 5.1.1.5 Water Storage

The majority of the water delivered by the SFPUC is supplied by runoff from the upper Tuolumne River watershed on the western slope of the central Sierra Nevada. Three major reservoirs collect runoff: Hetch Hetchy Reservoir, Lake Lloyd, and Lake Eleanor (see table below). A "water bank" in Don Pedro Reservoir is integrated into system operations.[12] Don Pedro Reservoir is jointly owned and operated by Modesto Irrigation District and Turlock Irrigation District (the Districts), and is located on the Tuolumne River downstream of the Hetch Hetchy System.

As a by-product of water delivery and water supply management, hydroelectric power is generated by the Hetch Hetchy Water and Power System. Water stored in Hetch Hetchy Reservoir is used for hydroelectric generation and also satisfies instream flow requirements when released downstream. Normally, only Hetch Hetchy Reservoir water supplies are exported to the Bay Area, while releases from Lake Eleanor and Lake Lloyd are used to satisfy instream flow requirements, satisfy Raker Act entitlements to the Districts downstream, and produce hydroelectric power. The Hetch Hetchy Water and Power System is comprised of three major hydroelectric powerhouses along the Tuolumne River—Holm, Kirkwood, and Moccasin—that have a collective generating capacity of nearly 400 megawatts.

[12] Turlock and Modesto Irrigation Districts have senior water rights to the SFPUC for the Tuolumne River water and are entitled to the first increment of flow in the basin. Water bank provides a credit and debit system which allows the SFPUC to divert water upstream while meeting its obligations to Modesto and Turlock Irrigation Districts. Through this mechanism the SFPUC may pre-deliver the Districts entitlements and credit the water bank so that at other times the SFPUC may retain water upstream while the Districts debit water bank.

**Regional Water System Storage Capacity**

| Reservoir | Storage | |
|---|---|---|
| | Acre-Feet (AF) | Billions of Gallons (BG) |
| Up-Country[a] | | |
| Hetch Hetchy | 360,360 | 117.4 |
| Lake Lloyd[b] | 273,300 | 89.1 |
| Lake Eleanor | 27,100 | 8.8 |
| **Subtotal Up-Country** | **660,760** | **215.3** |
| Local | | |
| Calaveras (East Bay)[c] | 96,800 | 31.5 |
| San Antonio (East Bay) | 50,500 | 16.5 |
| Crystal Springs (Peninsula)[d] | 69,300 | 22.6 |
| San Andreas (Peninsula) | 19,000 | 6.2 |
| Pilarcitos (Peninsula) | 3,100 | 1.0 |
| **Subtotal Local** | **238,700** | **77.8** |
| **Total Regional Water System[e]** | **899,460** | **293.1** |

a Three other regulating reservoirs are also part of the RWS: Early Intake, Priest, and Moccasin Reservoirs.
b Storage capacity shown includes flashboards, which are structures placed in a spillway to increase the capacity of a reservoir.
c Calaveras Reservoir was constructed with a storage capacity of 96,800 AF. Since December 2001, in response to safety concerns about the seismic stability of the dam and a directive from the Division of Safety of Dams (DSOD), the SFPUC has held the maximum water level at approximately 37,800 AF (roughly 40% of its maximum capacity), pending construction of a new comparably sized replacement dam downstream, expected to be completed in 2018.
d Crystal Springs Reservoir has a maximum storage capacity of 22.1 BG (at 291.8 feet). When the Lower Crystal Springs Dam Improvement is complete, the reservoir will be operated normally at 287.8 feet (4 feet below capacity) based on permit conditions.
e This includes 63,700 AF in dead storage (i.e., the volume in a reservoir below the lowest controllable level). In addition, the SFPUC may draw against a credit of up to 570,000 AF in storage in a water bank account in Don Pedro Reservoir, for total storage for planning purposes of 1,469,460 AF.

Downstream of the Hetchy Hetchy System, the SFPUC utilizes local watersheds in the Bay Area. On the Peninsula, the Crystal Springs, San Andreas, and Pilarcitos Reservoirs located in San Mateo County capture local watershed runoff. In the Alameda Creek watershed in Alameda County, the SFPUC operates Calaveras and San Antonio Reservoirs. In addition to using these facilities to capture local runoff, San Andreas, San Antonio, and Crystal Springs Reservoirs also provide storage for the Hetch Hetchy System and, along with Calaveras Reservoir, are an important water supply in the event of an interruption to Hetch Hetchy System deliveries.

Calaveras Reservoir is currently operating at one-third of its capacity due to restrictions imposed by the Division of Safety of Dams (DSOD). The Calaveras Dam Improvement Project is currently in construction to return the reservoir to its full capacity.

### 5.1.2 Individual Supply Guarantees

San Francisco has a perpetual commitment (Supply Assurance) to deliver 184 mgd to the 24 permanent wholesale customers collectively. San Jose and Santa Clara are not included in the Supply Assurance commitment and each has temporary and interruptible water supply contracts with San Francisco. The Supply Assurance is allocated among the 24 permanent wholesale customers through Individual Supply Guarantees (ISG), which represent each wholesale customer's allocation of the 184 mgd Supply Assurance.

Burlingame's Individual Supply Guarantee (ISG) is 5.23 million gallons per day (MGD), or approximately 1,909 million gallons (MG) per year (see Table 5-1). Between 2011 and 2015, the Burlingame purchased between 67% and 80% of its ISG for use in the Burlingame service area.

### 5.1.3 2018 Interim Supply Limitation

As part of its adoption of the Water System Improvement Program (WSIP) in October 2008, discussed separately herein, the SFPUC adopted a water supply limitation, the Interim Supply Limitation (ISL), which limits sales from San Francisco Regional Water System (RWS) watersheds to an average annual of 265 mgd through 2018.

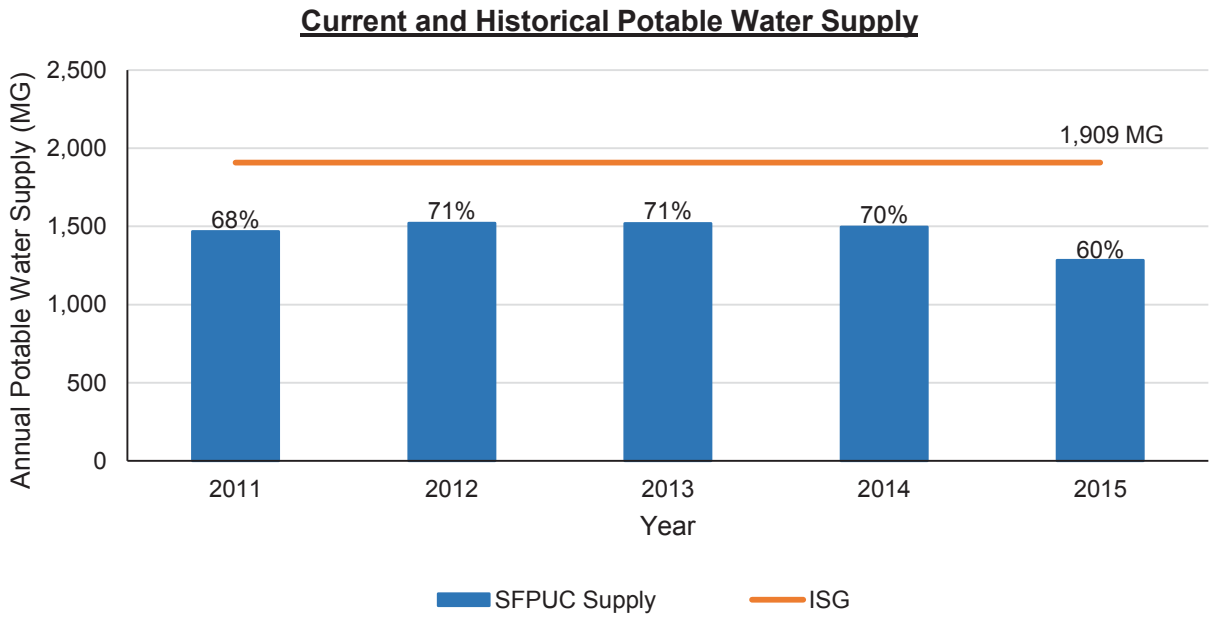
All 26 wholesale customers and San Francisco are subject to the ISL. The wholesale customers' collective allocation under the ISL is 184 mgd and San Francisco's is 81 mgd. Although the wholesale customers did not agree to the ISL, as further discussed below, the WSA provides a framework for administering the ISL.

### 5.1.4 Interim Supply Allocations

The Interim Supply Allocations (ISAs) refer to San Francisco's and each individual wholesale customer's share of the Interim Supply Limitation (ISL). On December 14, 2010, the SFPUC established each agency's ISA through 2018. In general, the SFPUC based the wholesale customer allocations on the lesser of the projected fiscal year 2017-18 purchase projections or Individual Supply Guarantees. The ISAs are effective only until December 31, 2018 and do not affect the Supply Assurance or the Individual Supply Guarantees, both discussed separately herein. San Francisco's ISA is 81 mgd.

**Table 5-1**
**Current and Historical Potable Water Supply (DWR Table 6-8)**
City of Burlingame, California

| Potable Water Source | Annual Production (MG) | | | | |
|---|---|---|---|---|---|
| | 2011 | 2012 | 2013 | 2014 | 2015 |
| *Imported Water* | | | | | |
| SFPUC | 1,467 | 1,521 | 1,520 | 1,497 | 1,283 |
| *% of ISG (a)* | *68%* | *71%* | *71%* | *70%* | *60%* |
| **Total** | **1,467** | **1,521** | **1,520** | **1,497** | **1,283** |




Abbreviations:
"DWR" = California Department of Water Resources
"ISG" = Individual Supply Guarantee
"MG" = million gallons
"MGD" = million gallons per day
"SFPUC" = San Francisco Public Utilities Commission

Notes:
(a) The annual water supply values for 2011 through 2015 are based on monthly wholesale water meter readings, on a fiscal year basis. The values presented do not include water that was purchased from SFPUC and sold to another agency.

(b) The City of Burlingame has an ISG of 5.23 MGD, or approximately 1,909 MG per year. Burlingame's ISA through 2018 is 4.97 MGD, or approximately 1,814 MG per year, but this ISA is only triggered when the demand on the SFPUC Regional Water System as a whole exceeds 265 MGD, and then it only means that Burlingame would be charged an environmental surcharge for any incremental use over its ISA.

As stated in the WSA, the wholesale customers do not concede the legality of the Commission's establishment of the ISAs and Environmental Enhancement Surcharge, discussed below, and expressly retain the right to challenge either or both, if and when imposed, in a court of competent jurisdiction.

Burlingame's ISA is 4.97 MGD, or approximately 1,814 MG per year.

### 5.1.5 Environmental Enhancement Surcharge

As an incentive to keep Regional Water System (RWS) deliveries below the ISL of 265 mgd, the SFPUC adopted an Environmental Enhancement Surcharge for collective deliveries in excess of the ISL effective at the beginning of fiscal year 2011-12. This volume-based surcharge would be unilaterally imposed by the SFPUC on individual wholesale customers and San Francisco retail customers, when an agency's use exceeds their ISA and when sales of water to the wholesale customers and San Francisco retail customers, collectively, exceeds the ISL of 265 mgd. Actual charges would be determined based on each agency's respective amount(s) of excess use over their ISA. To date, no Environmental Enhancement Surcharges have been levied.

### 5.1.6 2018 SFPUC Decisions

In the WSA, there are three decisions the SFPUC committed to making before 2018 that will affect water supply development:
Whether or not to make the cities of San Jose and Santa Clara permanent customers,
Whether or not to supply the additional unmet supply needs of the wholesale customers beyond 2018, and
Whether or not to increase the wholesale customer Supply Assurance above 184 mgd.

Additionally, there have been recent changes to instream flow requirements and customer demand projections that will affect water supply planning beyond 2018. As a result, the SFPUC has developed a Water Management Action Plan (Water MAP) to provide necessary information to address the 2018 decisions and to begin developing a water supply program for the 2019 to 2035 planning horizon. The water supply program will enable the SFPUC to continue to meet its commitments and responsibilities to wholesale and retail customers, consistent with the priorities of the SFPUC.

The Water MAP was presented by the SFPUC staff to its Commission in May 2015. The discussion resulting from the questions described in the Water MAP will help guide the water supply planning objectives through 2035. While the Water MAP is not a water supply program, it presents pertinent information that will help develop the SFPUC's future water supply planning program. At this time, and for purposes of long-term planning, it is assumed that deliveries from the RWS to San Francisco's wholesale customers will not be in excess of 184 mgd.

## 5.2 GROUNDWATER

Historically, the City has not utilized groundwater as a drinking water source (i.e., as described above, the sole source of the City's drinking water has been wholesale water supplied by the SFPUC). However, the City has constructed one groundwater supply well located near Washington Park (WP Well), which has been used to irrigate portions of City-owned landscaping and parks, including Washington Park, City Hall, Alpine Park, Victoria Park, and Burlingame High School (Roman & Lougee, 2000). The WP Well was not constructed for drinking water purposes and is not rated as a drinking water well.

The WP Well has been used intermittently since its construction in the early 1990's, and is not currently in operation. The City has recently begun rehabilitation efforts at the WP Well. However, the City has not yet determined the long-term reliability of the groundwater supply and does not expect to utilize groundwater as a regular potable water source in the future. Historic and potential future use of the WP Well is described in more detail below. In addition, information related to the local groundwater basin is provided below.

### 5.2.1 Groundwater Basin Description

*10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
*10631 (b) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan: (2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.*

Burlingame overlies the southern portion of the approximately 40 square mile Westside Groundwater Basin (groundwater basin number 2-35; DWR, 2006; or Basin). The Basin is not adjudicated, nor has it been found by the Department of Water Resources (DWR) to be in a condition of overdraft. As part of the implementation of the Sustainable Groundwater Management Act (SGMA), the subbasin was ranked as a "very low priority"[13] basin under the California Statewide Groundwater Elevation Monitoring (CASGEM) basin prioritization process and is therefore not subject to the requirements of SGMA.

The Basin consists of unconsolidated colluvium that was deposited in a northwest trending trough in the underlying impervious bedrock. The approximate boundaries of the Basin are

[13] Westside basin CASGEM summary, http://www.water.ca.gov/groundwater/casgem/pdfs/basin_prioritization/NCRO%2047.pdf, accessed on 15 April 2016.

shown in Figure 5-2. The Basin is bounded by bedrock highs in Golden Gate Park to the North and at Coyote Point to the South (DWR Bulletin 118, Rogge, 2003; Yates, 2003a; DWR, 2006). The San Bruno Mountains and San Francisco Bay form the eastern boundary of the Basin while the Serra Fault[14] and the Pacific Ocean form the western boundary (Rogge, 2003; Yates, 2003a; DWR, 2006). Adjoining groundwater basins are the Lobos Basin to the North and the San Mateo Plain Aquifer to the South.

It should be noted that Basin boundary shown on Figure 5-2 has only recently been identified in the literature (i.e., in Rogge, 2003; Yates, 2003a; DWR, 2006). Previously, the Basin was thought to be delineated to the west by the San Andreas Fault (CH2MHill, 1997) and the southern boundary had not been precisely defined. Phillips et al. (1993) tentatively determined that the southern Basin boundary was in Millbrae because of the increase in clay content that was encountered in boring logs. Millbrae was then identified as the southern boundary of the Basin in subsequent reports (Luhdorff and Scalmanini, 2002). More recent review of work related to bedrock mapping and groundwater elevation contouring has led to re-defining the Basin's southern boundary at Coyote Point (Rogge, 2003; Yates, 2003a; DWR, 2006), and the Basin's western boundary along the Serra Fault. The modification of the southern boundary of the Basin has resulted in the inclusion of Burlingame within the Basin.

#### 5.2.1.1 Aquifer Conditions and Properties

The Basin is composed of two main water-bearing units, the shallow, unconfined Colma aquifer and the deeper, confined Merced aquifer. Within the two major water bearing zones in the Basin, there are multiple smaller aquifer zones that are delineated vertically by different sand and clay layers within the Merced and Colma formations. The thickness and extent of these interbedded sand and clay layers vary spatially throughout the Basin.

All of the municipal groundwater extraction wells in the Cities of San Bruno, South San Francisco, and Daly City are screened in the deeper, confined Merced aquifer where the water quality is better. The specific yield of wells in the Basin has been observed to be greater in the northern portions of the Basin than in the southern (SBMP, 2001; Yates, 2003a). Shallow wells have been installed within the Colma, typically to monitor groundwater in the vicinity of chemical release sites. Steep downward vertical gradients exist between the unconfined (upper) and confined (deeper) aquifers, but the hydraulic connection between the two aquifers is thought to be limited (Yates, 2003a; Luhdorff & Scalmanini, 2002).

#### 5.2.1.2 Groundwater Levels and Flow Directions

Figure 5-3 presents a conceptual model of the Basin with arrows indicating the general groundwater flow directions. At the northern end of the Basin, groundwater in the shallow aquifer tends to flow in a westerly direction towards the Pacific Ocean. From South San Francisco southward to Burlingame, groundwater within the shallow aquifer generally flows east towards San Francisco Bay (Rogge, 2003; Yates, 2003a).

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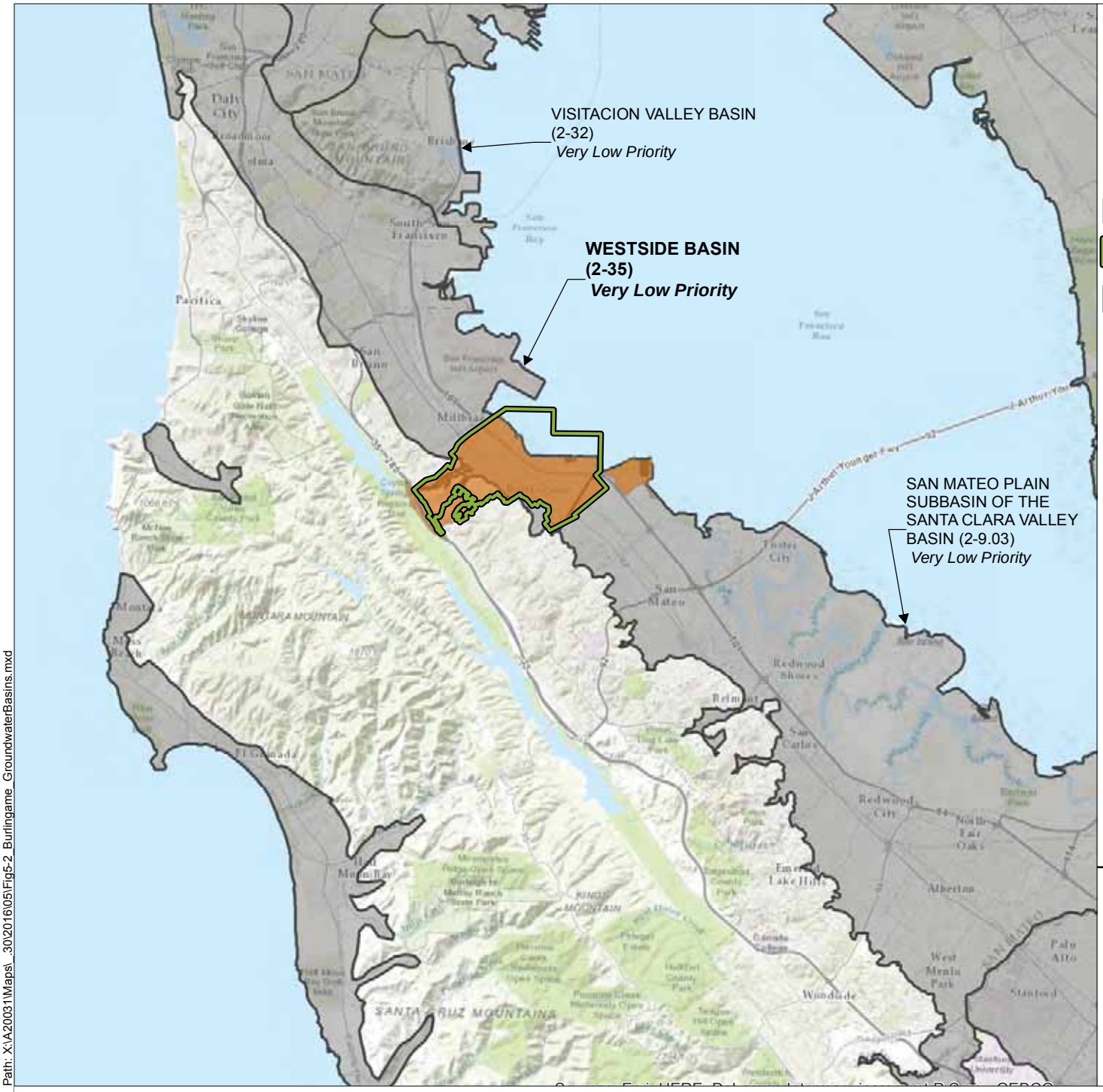
[14] The Serra Fault is a series of thrust faults parallel to the San Andreas Fault in the Coast Ranges (Rogge, 2003).




N

0 3 6

(Approximate Scale in Miles)

## Legend

- DWR Bulletin 118 Groundwater Basin
- City of Burlingame Boundary
- City of Burlingame Water Service Area

## Abbreviations

CASGEM = California Statewide Groundwater Elevation Monitoring Program

DWR = Department of Water Resources

## Notes

1. All locations are approximate.
2. Priority rankings from CASGEM groundwater basin prioritization, June 2014.

## Sources

World Topographic base map provided by ArcGIS Online (ESRI, HERE, DeLorme, TomTom, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBease, IGN, Kadaster NL, Ordinance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, MapmyIndia, OpenStreetMap contributors, and the GIS User Community), obtained 20 June 2016.

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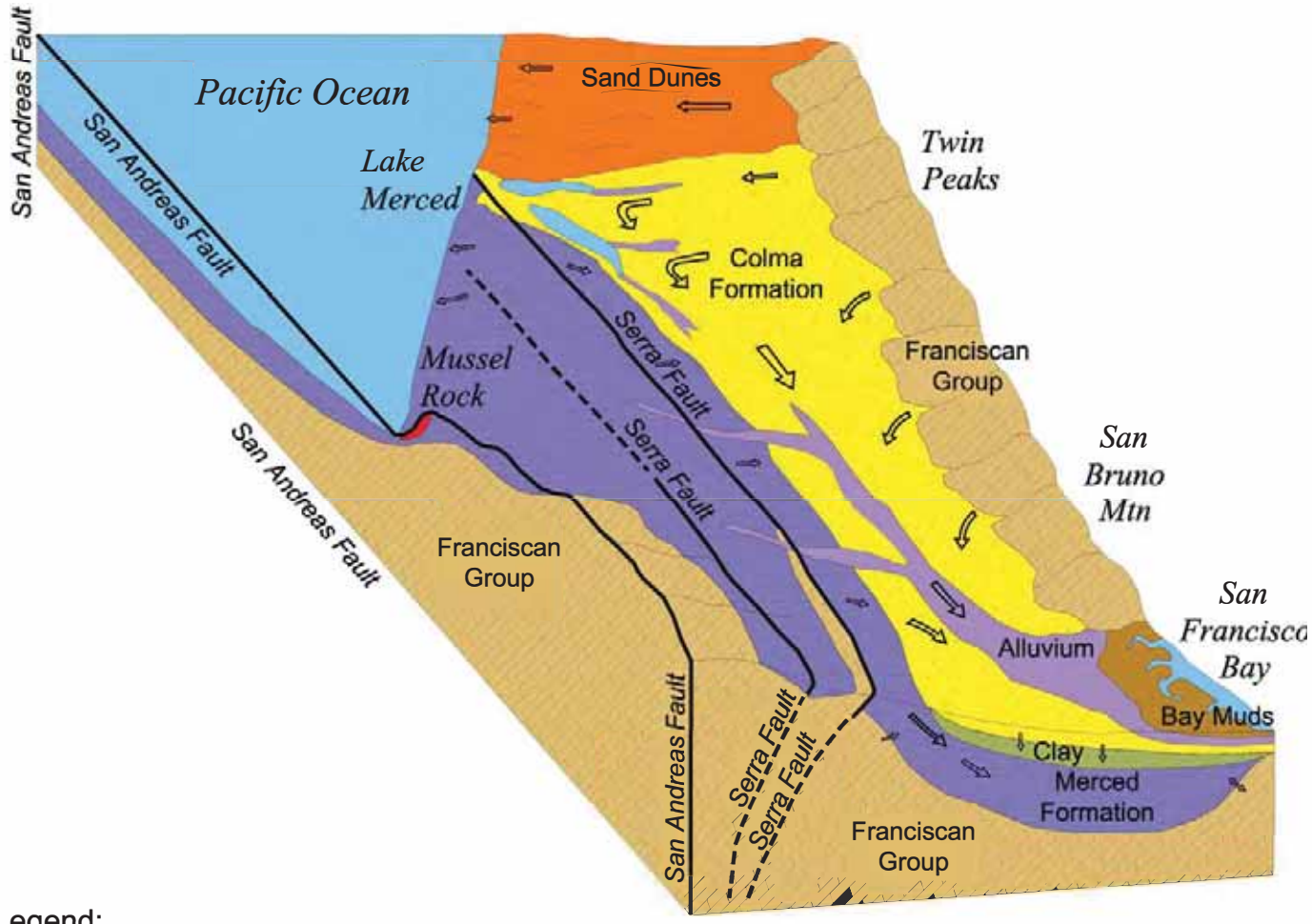
Groundwater Basins in the Vicinity of Burlingame Service Area

City of Burlingame
2015 Urban Water Management Plan
Burlingame, CA
June 2016
EKI A20031.30

Figure 5-2

Path: X:\A20031\Maps\...30\2016\05\Fig5-2_Burlingame_GroundwaterBasins.mxd




## Legend:

- Colma Formation - sand and silty sand with interbedded silt, gravel, and clay layers
- Merced Formation - sand with thin interbedded silt and clay layers
- Bedrock - Franciscan Formation
- Clay Aquitard

## Notes:

1. All locations are approximate.
2. This figure presents a conceptual model of the Westside Groundwater Basin showing the different geologic formations within the Basin. The arrows show generalized groundwater flow directions within the Basin.
3. Source: Rogge, 2003, *Dimensions of the Westside Groundwater Basin, San Francisco and San Mateo Counties, California,* Masters Thesis at San Francisco State University.

**Erler & Kalinowski, Inc.**

Conceptual Model of the Westside Groundwater Basin

City of Burlingame
Burlingame, CA
June 2016
EKI A20031.30

Figure 5-3

Throughout the Basin, groundwater flow in the deeper aquifer is generally east towards San Francisco Bay. The groundwater mounds observed near Coyote Point and Golden Gate Park add a northern and southern component to the flow, respectively. Additionally, historic groundwater extraction in the vicinity of San Bruno has created a local depression in the water table. A flow divide near the south end of the San Francisco airport separates the area where groundwater flows toward the pumping depression in San Bruno from the area where groundwater flows toward the Bay (Yates, 2003a). The divide trends south-southwest from near the Millbrae exit on Highway 101, and groundwater west of the divide is captured by the San Bruno wells (Yates, 2003a). In the vicinity of Burlingame, which is south of the groundwater divide, groundwater flow is generally east towards the San Francisco Bay. However, there is a concern in the future that extraction in the vicinity of San Bruno could cause saltwater intrusion along San Francisco Bay and beneath Burlingame.

### 5.2.2 Groundwater Management

*10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
*10631. (b) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan: (1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.*

Per SGMA, groundwater basins that are designated as high or medium priority must be managed to achieve sustainability within a set timeframe. As stated above, the subbasin is currently designated by DWR as a very low priority basin and is currently exempt from complying with SGMA. The DWR will complete a basin re-ranking process in 2017[15], at which time the subbasin prioritization may change to reflect the planned increased dependence on groundwater within the subbasin.

Burlingame has not historically utilized groundwater as a significant water supply source or participated in management of the Basin. However, other entities that overly the Basin, such as the Cities of San Bruno and Daly City, rely on groundwater for a significant portion of their potable water supply and are actively involved in Basin management. The southern portion of the Basin is currently managed under the South Westside Basin Groundwater Management Plan.[16] Appendix F contains a copy of the Groundwater Management Plan, dated July 2012.

[15] Under SGMA, basin prioritization rankings will be updated every time Bulletin 118 basin boundaries are revised. Two Bulletin 118 updates are anticipated within the next five years: an interim update in late 2016/2017 and a comprehensive update in 2020.

[16] South Westside Basin Groundwater Management Plan, dated July 2012, http://sfwater.org/Modules/ShowDocument.aspx?documentid=3104, accessed 15 April 2016.

### 5.2.3 Historical Groundwater Use

*10631. A plan shall be adopted in accordance with this chapter and shall do all of the following: 10631. (b) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan: (3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

As discussed above, the City has not historically used groundwater as a potable water source (see Appendix A, DWR Table 6-1). However, the City has operated one groundwater well for irrigation purposes at Washington Park. The WP Well, storage tank, and distribution system were constructed in the early 1990's to supply City parks with groundwater. The WP Well was initially intended to supply irrigation water to Alpine Park, Victoria Park, and Washington Park, City Hall, and Burlingame High school, but it was later determined that distribution to the outlying parks was impractical. Instead, the WP Well was used to irrigate three sections of Washington Park: the ball field, the back park, and the front park.

The WP Well operated for approximately one year but data regarding the production capacity and pumping schedules during this operational period are not available. Consistent pumping was discontinued because of operational difficulties, and the WP Well has since been used only intermittently. Since the water extracted by the WP Well is not metered and its operation has been sporadic, the quantity of water extracted in recent years is not available.

### 5.2.4 Projected Future Groundwater Use

*10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
*10631. (b) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan: (4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*
*10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
*10631. (b) If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan: (3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

Burlingame purchases all of its potable water from the SFPUC RWS and there are no plans to use groundwater as a supplemental potable water supply source in the future (see Table 5-3). However, it is expected that groundwater will be used in the future on an irregular basis to supply irrigation water to portions of Washington Park during periods of drought only. The total demand from the three sections of Washington Park that would receive groundwater for irrigation is estimated to be approximately 0.025 MGD (EKI, 2011). This estimate is based on

the summer irrigation demand estimates of Washington Park based on irrigation schedules provided by Burlingame's Parks and Recreation Department and monthly water use patterns for all City Parks (provided by City Consumption Reports) (EKI, 2004).[17] According to production estimates of the WP Well and the available storage in the WP Well storage tank, the WP Well system has the capacity to meet these irrigation demands.[18]

However, should the currently projected water supply available to the City materially change, the City may elect in the future to further evaluate the availability of groundwater as a potential source of supply.

## 5.3 WASTEWATER AND RECYCLED WATER

*10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.*

Recycling water involves treating wastewater to an acceptable level such that it can be reused for irrigation, cooling, and other non-potable applications. A key benefit of water recycling is its potential to offset the use of potable supplies. The regulatory requirements for recycled water are defined in the California Code of Regulations, Title 22, Article 3 (Title 22) and differ for different uses (e.g. irrigation for food crops, landscape, and recreation). Because recycled water is treated wastewater, its availability is closely linked to the location and treatment capability of the wastewater treatment plant that receives and treats wastewater from a water supplier's service area.

As described further below, the City currently uses approximately 0.3 MGD of recycled water for internal use within the WWTP. The following section describes wastewater collection and treatment for the Burlingame service area and current and potential future uses of recycled water.

### 5.3.1 Coordination

The City coordinates with adjacent municipalities and wastewater agencies in both the treatment and discharge of its wastewater. Burlingame's WWTP processes wastewater from the City, the unincorporated Burlingame Hills, and the Town of Hillsborough. The WWTP is located approximately at sea level along the San Francisco Bay. The WWTP contains facilities to recycle a portion of the treated wastewater for use within the WWTP.

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[17] For the purpose of this UWMP, the City has assumed that monthly water use trends in Washington Park are similar to those trends observed at all of the City Parks. Based on the fraction of total annual water use consumed at all City Parks during each month of the year, and the estimated July irrigation demand at Washington Park, water demands were extrapolated for the months of August through June. The sum of these monthly demand estimates is 0.025 MGD.

[18] The potential pumping volume is based on the maximum sustainable pumping rate of 150 gpm.

Once treated, the City's effluent is sent through a joint transport system with the City of Millbrae, to South San Francisco. Prior to discharge into the San Francisco Bay through the South San Francisco Outfall, the Burlingame-Millbrae wastewater undergoes dechlorination along with the wastewater effluent from South San Francisco, Burlingame, and the City and County of San Francisco.

### 5.3.2 Wastewater Collection, Treatment, and Disposal

*10633. (a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.*
*10633. (b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.*

The following sections provide information regarding the WWTP collection and treatment system, wastewater quantities, and current uses of wastewater within Burlingame.

*Wastewater Collection System*
The City operates and maintains the wastewater collection system that conveys wastewater from the users to the WWTP. The City system includes gravity pipelines, lift stations, and force mains.

*Wastewater Treatment System*
Burlingame's WWTP treatment process includes four treatment steps: (1) primary sedimentation, (2) secondary biological treatment, (3) sodium hypochlorite disinfection, and (4) contact time in a plug flow detention facility. Recycled wastewater undergoes an additional flocculation and clarification treatment step. Following treatment at the WWTP, the effluent is sent to South San Francisco through the Burlingame-Millbrae Central Bay Outfall system and discharged after dechlorination into a joint-use deep-water outfall in the San Francisco Bay (Nolte, 1982; Roman & Lougee, 2000). An influent equalization basin was recently constructed to provide flow equalization during wet weather. No wastewater is disposed of within the Burlingame service area (see Appendix A, DWR Table 6-3).

*Wastewater Quantity*
The average dry weather flow (ADWF) of wastewater treated at the City's WWTP has remained fairly constant at approximately 3.0-3.5 MGD. The permit goes up to 5.5 MGD, ADWF, but the flow is not expected to increase significantly in the foreseeable future. The volume of wastewater collected from the Burlingame service area in 2015 was approximately 994 MG (Table 5-2).

*Current Wastewater Uses*
The Burlingame WWTP uses approximately 300,000 GPD of treated wastewater for internal use within the plant. However, the treated wastewater does not meet Title 22, Article 3 recycled water requirements for non-potable uses outside of the WWTP and is discharged into the San Francisco Bay through the Burlingame-Millbrae Central Outfall system after use (Nolte, 1982).

**Table 5-2**
**Wastewater Collected Within Service Area in 2015 (DWR Table 6-2)**
City of Burlingame, California

| Wastewater Collection | |
|---|---|
| Name of Wastewater Collection Agency | City of Burlingame |
| Wastewater Volume Metered or Estimated? | Metered |
| Volume of Wastewater Collected in 2015 (MG) | 994 |
| **Receipient of Collected Wastewater** | |
| Name of Wastewater Treatment Agency Receiving Collected Wastewater | City of Burlingame |
| Treatment Plant Name | Burlingame Wastewater Treatment Plant |
| Is WWTP Loacted Within UWMP Area? | No |
| Is WWTP Operation Contracted to a Third Party? (b) | No |

Abbreviations:
"DWR" = California Department of Water Resources
"MG" = million gallons
"WWTP" = wastewater treatment plant

Notes:
(a) The volume of wastewater collected within the service area is estimated based volumes metered by the City of Burlingame.
(b) The Burlingame WWTP is owned by the City of Burlingame and operated by a contractor to the City, Veolia Water North America.

### 5.3.3 Current Recycled Water Use

*10633. (c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.*

The City currently uses approximately 300,000 gallons per day (GPD) of recycled water for internal use within the WWTP (see Appendix A, DWR Table 6-4). The City has not historically used recycled water outside of the WWTP and does not currently have the treatment capabilities to meet Title 22, Article 3 criteria for re-use of the recycled water for non-potable uses such as irrigation.

### 5.3.4 Comparison of Previously Projected Use and Actual Use

*10633. (e) A description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.*

The 2010 UWMP projected there would be recycled water only at the WWTP. The City still uses recycled water at the WWTP and therefore, has met the previous projections (see Appendix A, DWR Table 6-5).

### 5.3.5 Potential and Projected Uses of Recycled Water

*10633. (d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.*
*10633. (e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years.*

Burlingame is in the initial phases of recycled water planning and has not developed recycled water use projections for the Burlingame service area (see Appendix A, DWR Table 6-4).

Potential future uses of recycled water include specific types of irrigation, impoundment, cooling and air conditioning, and other uses such as groundwater recharge, dust control, and flushing toilets and urinals.

Irrigation needs for Coyote Point and its golf course, hotel landscaping, and City parks and school fields could also potentially be met by recycled water, especially as these irrigation demands typically are greatest during the summer months, the time of greatest potable water demand (EKI, 2004). Construction water for dust control and moisture conditioning for compaction could also potentially be met with reclaimed water. If the recycled water is high enough quality (i.e., sufficiently low in minerals and salts), it could potentially be used for cooling water for industrial processes at local industries.

While the use of recycled water to reduce potable water demands is a potentially viable alternative in Burlingame, to extend current use of recycled water within the City would require expensive infrastructure and additional treatment capacities. Until more detailed studies can be conducted, the City does not anticipate an increase in its use of recycled water in the in the next 20 years.

### 5.3.6 Promoting Recycled Water Use

*10633. (f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.*
*10633. (g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.*

Burlingame is continuing to evaluate the feasibility of a recycled water facility and distribution system. Recycled water use projections have not been developed at this initial feasibility assessment stage. If the facilities plan moves ahead, it is anticipated that Burlingame may consider adopting recycled water requirements for new development projects that meet certain criteria and that such new buildings may be dual plumbed for the future use of recycled water, once it is available in the area (see Appendix A, DWR Table 6-6).

## 5.4 DESALINATED WATER

*10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
*10631 (i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.*

Opportunities to develop desalinated water supplies from ocean water, brackish surface, and brackish groundwater are being investigated by the BAWSCA as part of Phase II of its Long Term Reliable Water Supply Strategy (Strategy, see Section 6.1). According to BAWSCA, there are high costs and intensive permitting requirements associated with desalination, however, it does potentially provide a substantial yield given the limited options for generating significant new water supplies for the region. Aside from its support to date for the development of BAWSCA's Strategy, Burlingame is not pursuing desalination at this time.

## 5.5 WATER TRANSFERS

*10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
*10631(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.*

There are potential transfer and exchange opportunities within and outside of the SFPUC RWS. Burlingame does not presently anticipate the need for water right transfers during normal year conditions. However, should that condition change in the future, it is possible that the Burlingame could purchase water from another agency or entity either within or outside of the SFPUC RWS.

Within the SFPUC RWS, it is possible to transfer water entitlements and / or banked water among agencies. The Water Shortage Allocation Plan (WSAP) adopted by all BAWSCA agencies and the SFPUC provides the basis for voluntary transfers of water among BAWSCA agencies during periods when mandatory rationing is in effect on the SFPUC RWS (see Section 6.3.1). Some BAWSCA agencies have the capacity to rely on groundwater or other sources during dry years and thus may be willing to transfer a portion of their wholesale water entitlement to other BAWSCA agencies in need of supply above their allocations.

Securing water from willing sellers outside the SFPUC RWS is a more complex process than transfers within the RWS, which requires both a contract with the seller agency and approval by the SFPUC. BAWSCA has the authority to plan for and acquire supplemental water supplies, and continues to evaluate the feasibility of water transfers as part of its implementation of the Strategy (see Section 6.1).

## 5.6 POTENTIAL WATER SUPPLY PROJECTS AND PROGRAMS

*10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
*10631 (h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single dry, and multiple dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.*

Burlingame is currently in the process of evaluating recycled water opportunities and has retained a consultant to conduct an investigation regarding its feasibility. Based upon the results of this effort, the City may consider future recycled water projects, as deemed appropriate. The effects of this potential recycled water expansion project on Burlingame's long-term water supply are not quantifiable at this point in time (see Appendix A, DWR Table 6-7). Burlingame is not currently considering any other water supply projects.

## 5.7 SUMMARY OF EXISTING AND PLANNED SOURCES OF WATER

*10631. (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision 10631(a).*
*10631. (b) (4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.*

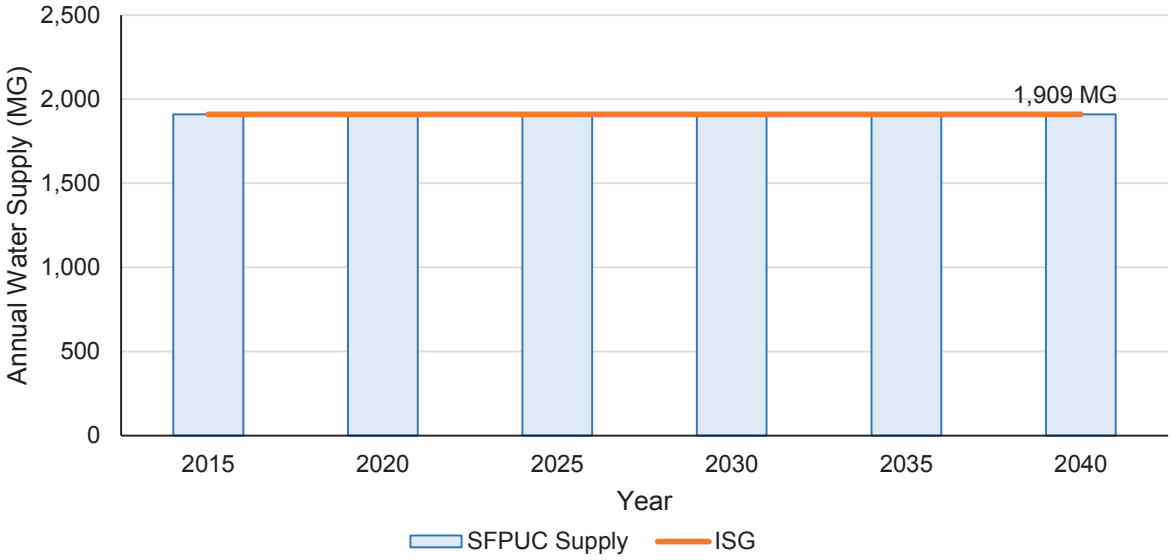
Burlingame purchases potable water from the SFPUC RWS to meet all of the potable water demands within the Burlingame service area. Burlingame purchased approximately 3.5 MGD in 2015 from the SFPUC RWS for use in the Burlingame service area (1,283 MG per year, Table 5-1). In addition, Burlingame produces and uses within its Wastewater Treatment Plant approximately 0.3 MGD of recycled water.

Burlingame plans to continue to purchase wholesale water from the SFPUC RWS and does not anticipate developing additional long-term potable water supplies from other sources in the near future. Water supplies from the SFPUC RWS through 2040 are projected to be equivalent to Burlingame's ISG of 1,909 MG, which is Burlingame's contractual entitlement to SFPUC wholesale water, which survives in perpetuity. Burlingame's total water supply projections are shown in Table 5-3 in five-year increments through 2040.

**Table 5-3**
**Current and Projected Potable Water Supply (DWR Table 6-9)**
City of Burlingame, California

| Potable Water Source | Current and Projected Potable Water Supply (MG) | | | | | |
|---|---|---|---|---|---|---|
| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
| *Imported Water* | | | | | | |
| SFPUC | 1,909 | 1,909 | 1,909 | 1,909 | 1,909 | 1,909 |
| | **1,909** | **1,909** | **1,909** | **1,909** | **1,909** | **1,909** |

**Current and Projected Potable Water Supply Entitlements**




Abbreviations:
"DWR" = California Department of Water Resources
"ISA" = Interim Supply Allocation
"ISG" = Individual Supply Guarantee
"MG" = million gallons
"SFPUC" = San Francisco Public Utilities Commission

Notes:
(a) Water supply available to Burlingame during a normal year is assumed to be equal to Burlingame's ISG. Burlingame has an ISG of 5.23 MGD, or approximately 1,909 MG per year. Burlingame's ISA through 2018 is 4.97 MGD, or approximately 1,814 MG per year, but this ISA is only triggered when the demand on the SFPUC Regional Water System as a whole exceeds 265 MGD, and then it only means that Burlingame would be charged an environmental surcharge for any incremental use over its ISA.

# 6. WATER SUPPLY RELIABILITY

*10631. (c)(2) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.*
*10620 (f). An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.*

As described in Section 5, all of the City of Burlingame's (Burlingame or City) potable water supply is purchased from the San Francisco Public Utilities Commission Regional Water System (SFPUC RWS). This section describes the constraints on that potable water supply (also referred to by SFPUC as "wholesale water"), as well as the management strategies that Burlingame and other affected agencies have employed or will employ to address these constraints. This section also provides an estimate of the supply volumes available to Burlingame and the corresponding supply and demand reliability assessments in normal years, single dry years, and multiple dry year periods. Information regarding the reliability of the SFPUC RWS was provided by Bay Area Water Supply and Conservation Agency (BAWSCA) in coordination with the SFPUC, and is presented verbatim below.

## 6.1 BAWSCA'S LONG TERM RELIABLE WATER SUPPLY STRATEGY

BAWSCA's Strategy was developed to quantify the water supply reliability needs of the BAWSCA member agencies through 2040, identify the water supply management projects and/or programs (projects) that could be developed to meet those needs, and prepare an implementation plan for the Strategy's recommendations. Successful implementation of the Strategy is critical to ensuring that there will be sufficient and reliable water supplies for the BAWSCA member agencies and their customers in the future.

Phase II of the Strategy was completed in February 2015 with release of the Strategy Phase II Final Report. The water demand analysis done during Phase II of the Strategy resulted in the following key findings:

- There is no longer a regional normal year supply shortfall.
- There is a regional drought year supply shortfall of up to 43 mgd.

In addition, the project evaluation analysis done during Phase II of the Strategy resulted in the following key findings:

- Water transfers score consistently high across the various performance measures and within various portfolio constructs and thus represent a high priority element of the Strategy.
- Desalination also potentially provides substantial yield, but its high effective costs and intensive permitting requirements make it a less attractive drought year supply alternative. However, given the limited options for generating

significant yield for the region, desalination warrants further investment in information as a hedge against the loss of local or other imported supplies.

- The other potential regional projects provide tangible, though limited, benefit in reducing dry year shortfalls given the small average yields in drought years.

BAWSCA is now implementing the Strategy recommendations in coordination with BAWSCA member agencies. Strategy implementation will be adaptively managed to account for changing conditions and to ensure that the goals of the Strategy are met efficiently and cost-effectively.

Due to the size of the supply and reliability need, and the uncertainty around yield of some Strategy projects, BAWSCA will need to pursue multiple actions and projects in order to provide some level of increased water supply reliability for its member agencies. On an annual basis, BAWSCA will reevaluate Strategy recommendations and results in conjunction with development of the work plan for the following year. In this way, actions can be modified to accommodate changing conditions and new developments.

## 6.2 RELIABILITY OF THE REGIONAL WATER SYSTEM

*10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
*10631 (k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water -year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).*

The SFPUC's Water System Improvement Program (WSIP) provides goals and objectives to improve the delivery reliability of the Regional Water System (RWS) including water supply reliability. The goals and objectives of the WSIP related to water supply are:

| Program Goal | System Performance Objective |
|---|---|
| Water Supply – *meet customer water needs in non-drought and drought periods* | • Meet average annual water demand of 265 million gallons per day (mgd) from the SFPUC watersheds for retail and wholesale customers during non-drought years for system demands through 2018.<br>• Meet dry-year delivery needs through 2018 while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts.<br>• Diversify water supply options during non-drought and drought periods.<br>• Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers. |

The adopted WSIP had several water supply elements to address the WSIP water supply goals and objectives. The following provides the water supply elements for all year types and the dry-year projects of the adopted WSIP to augment all year type water supplies during drought.

### 6.2.1 Water Supply – All Year Types

The SFPUC historically has met demand in its service area in all year types from its watersheds. They are the:

- Tuolumne River watershed
- Alameda Creek watershed
- San Mateo County watersheds

In general, 85 percent of the supply comes from the Tuolumne River through Hetch Hetchy Reservoir and the remaining 15 percent comes from the local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San Andreas Reservoirs. The adopted WSIP retains this mix of water supply for all year types.

### 6.2.2 Water Supply – Dry-Year Types

The adopted WSIP includes the following water supply projects to meet dry-year demands with no greater than 20 percent system-wide rationing in any one year:

<u>Calaveras Dam Replacement Project</u>

Calaveras Dam is located near a seismically active fault zone and was determined to be seismically vulnerable. To address this vulnerability, the SFPUC is constructing a new dam of equal height downstream of the existing dam. The Environmental Impact Report was certified by the San Francisco City Planning Commission in 2011, and construction is now ongoing. Construction of the new dam is slated for completion in 2018; the entire project should be completed in 2019.

Alameda Creek Recapture Project

The Alameda Creek Recapture Project will recapture the water system yield lost due to instream flow releases at Calaveras Reservoir or bypassed around the Alameda Creek Diversion Dam and return this yield to the RWS through facilities in the Sunol Valley. Water that naturally infiltrates from Alameda Creek will be recaptured into an existing quarry pond known as SMP (Surface Mining Permit)-24 Pond F2. The project will be designed to allow the recaptured water to be pumped to the Sunol Valley Water Treatment Plant or to San Antonio Reservoir. The project's Draft Environmental Impact Report will be released in the spring of 2016, and construction will occur from spring 2017 to fall 2018.

Lower Crystal Springs Dam Improvements

The Lower Crystal Springs Dam Improvements were substantially completed in November 2011. While the project has been completed, permitting issues for reservoir operation have become significant. While the reservoir elevation was lowered due to Division of Safety of Dams restrictions, the habitat for the Fountain Thistle, an endangered plant, followed the lowered reservoir elevation. Raising the reservoir elevation now requires that new plant populations be restored incrementally before the reservoir elevation is raised. The result is that it may be several years before the original reservoir elevation can be restored.

Regional Groundwater Storage and Recovery Project

The Groundwater Storage and Recovery Project is a strategic partnership between SFPUC and three San Mateo County agencies: the California Water Service Company (serving South San Francisco and Colma), the City of Daly City, and the City of San Bruno. The project seeks to balance the management of groundwater and surface water resources in a way that safeguards supplies during times of drought. During years of normal or heavy rainfall, the project would provide additional surface water to the partner agencies in San Mateo County, allowing them to reduce the amount of groundwater that they pump from the South Westside Groundwater Basin. Over time, the reduced pumping would allow the aquifer to recharge and result in increased groundwater storage of up to 20 billion gallons.

The project's Final Environmental Impact Report was certified in August 2014, and the project also received Commission approval that month. The well station construction contract Notice to Proceed was issued in April 2015, and construction is expected to be completed in spring 2018.

2 mgd Dry-year Water Transfer

In 2012, the dry-year transfer was proposed between the Modesto Irrigation District and the SFPUC. Negotiations were terminated because an agreement could not be reached. Subsequently, the SFPUC is having ongoing discussions with the Oakdale Irrigation District for a one-year transfer agreement with the SFPUC for 2 mgd (2,240 acre-feet).

In order to achieve its target of meeting at least 80 percent of its customer demand during droughts at 265 mgd, the SFPUC must successfully implement the dry-year water supply projects included in the WSIP.

Furthermore, the permitting obligations for the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements include a combined commitment of 12.8 mgd for instream flows on average. When this is reduced for an assumed Alameda Creek Recapture Project recovery of 9.3 mgd, the net loss of water supply is 3.5 mgd. The SFPUC's participation in regional water supply reliability efforts, such as the Bay Area Regional Desalination Project (BARDP), additional water transfers, and other projects may help to make up for this shortfall.

### 6.2.3 Projected SFPUC Regional Water System Supply Reliability

The SFPUC has provided the attached table [Appendix G; Table 3] presenting the projected RWS supply reliability. This table assumes that the wholesale customers purchase 184 mgd from the RWS through 2040 and the implementation of the dry-water water supply projects included in the WSIP. The numbers represent the wholesale share of available supply during historical year types per the Tier One Water Shortage Allocation Plan. This table does not reflect any potential impact to RWS yield from the additional fishery flows required as part of Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements Project.

### 6.2.4 Impact of Recent SFPUC Actions on Dry Year Reliability

As noted earlier, in adopting the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements Project, the SFPUC committed to providing fishery flows below Calaveras Dam and Lower Crystal Springs Dam, as well as bypass flows below Alameda Creek Diversion Dam. The fishery flow schedules for Alameda Creek and San Mateo Creek represent a potential decrease in available water supply of an average annual 9.3 mgd and 3.5 mgd, respectively with a total of 12.8 mgd average annually. The Alameda Creek Recapture Project, described above, will replace the 9.3 mgd of supply lost to Alameda Creek fishery flows. Therefore, the remaining 3.5 mgd of fishery flows for San Mateo Creek will potentially create a shortfall in meeting the SFPUC demands of 265 mgd and slightly increase the SFPUC's dry-year water supply needs.

The adopted WSIP water supply objectives include (1) meeting a target delivery of 265 mgd through 2018 and (2) rationing at no greater than 20 percent system-wide in any one year of a drought. As a result of the fishery flows, the SFPUC may not be able to meet these objectives between 2015 and 2018. Participation in the BARDP and additional water transfers, as described earlier, may help manage the water supply loss associated with the fishery flows.

As a result of the Individual Supply Guarantees described above, the SFPUC has a responsibility to provide 184 mgd to its wholesale customers in perpetuity, regardless of demand. Therefore, the current projections for purchase requests through 2018 remain at 265 mgd, which includes wholesale and retail demand. However, in the last decade including the current drought, SFPUC deliveries have been below this level, as illustrated in the table below.

Water Deliveries in San Francisco Regional Water System Service Area[19]

| Fiscal Year | Total Deliveries (mgd) |
|---|---|
| 2005-06 | 247.5 |
| 2006-07 | 257.0 |
| 2007-08 | 254.1 |
| 2008-09 | 243.4 |
| 2009-10 | 225.2 |
| 2010-11 | 219.9 |
| 2011-12 | 220.5 |
| 2012-13 | 223.9 |
| 2013-14 | 222.3 |
| 2014-15 | 196.0 |

Under the current drought to date, the SFPUC has called for, but has not mandated, a 10 percent system-wide reduction since January 2014. The SFPUC has not yet been compelled to declare a water shortage emergency and impose mandatory system-wide rationing because its customers have exceeded the 10 percent voluntary system-wide reduction in conjunction with the state-wide mandatory reductions assigned by the State Water Resources Control Board. If current drought conditions worsen between 2015 and 2018, and the SFPUC determines that system-wide rationing would need to be imposed, then the SFPUC would issue a declaration of a water shortage emergency in accordance with Water Code Section 350 and implement rationing in accordance with the WSA and WSAP as described above.

## 6.3 TIER 1 AND TIER 2 WATER SHORTAGE ALLOCATIONS

The following is a discussion regarding the Tier 1 Drought Allocation between SFPUC and BAWSCA and the Tier 2 Drought Allocation amongst the BAWSCA agencies. As above, this language was provide by BAWSCA in coordination with SFPUC and is presented verbatim below.

### 6.3.1 Tier 1 Drought Allocations

In July 2009, the wholesale customers and San Francisco adopted the Water Supply Agreement (WSA), which includes a Water Shortage Allocation Plan (WSAP) to allocate water from the Regional Water System (RWS) to retail and wholesale customers during system-wide shortages of 20 percent or less (the Tier One Plan). The WSAP has two components:

- The Tier One Plan, which allocates water between San Francisco and the wholesale customers collectively; and
- The Tier Two Plan, which allocates the collective wholesale customer share among the wholesale customers

[19] Reference: SFPUC FY 9-10 and FY 2014-15 J-Tables Line 9 “Total System Usage” plus 0.7 mgd for Lawrence Livermore National Laboratory use and 0.4 mgd for Groveland. No groundwater use is included in this number. Non-revenue water is included.

The Tier One Plan allocates water between San Francisco and the wholesale customers collectively based on the level of shortage:

| Level of System-Wide Reduction in Water Use Required | Share of Available Water | |
|---|---|---|
| | SFPUC Share | Wholesale Customers Share |
| 5% or less | 35.5% | 64.5% |
| 6% through 10% | 36.0% | 64.0% |
| 11% through 15% | 37.0% | 63.0% |
| 16% through 20% | 37.5% | 62.5% |

The Tier One Plan allows for voluntary transfers of shortage allocations between the SFPUC and any wholesale customer and between wholesale customers themselves. In addition, water "banked" by a wholesale customer, through reductions in usage greater than required, may also be transferred.

The Tier One Plan will expire at the end of the term of the WSA in 2034, unless mutually extended by San Francisco and the wholesale customers.

The Tier One Plan applies only when the SFPUC determines that a system-wide water shortage exists and issues a declaration of a water shortage emergency under California Water Code Section 350. Separate from a declaration of a water shortage emergency, the SFPUC may opt to request voluntary cutbacks from San Francisco and the wholesale customers to achieve necessary water use reductions during drought periods. During the current drought to date, the SFPUC has requested, but has not mandated, a 10 percent system-wide reduction since January 2014. The SFPUC has not yet been compelled to declare a water shortage emergency and implement the Tier One Plan because its customers have exceeded the 10 percent voluntary system-wide reduction in conjunction with the state-wide mandatory reductions assigned by the State Water Resources Control Board.

### 6.3.2 Tier 2 Drought Allocations

The wholesale customers have negotiated and adopted the Tier Two Plan, the second component of the WSAP, which allocates the collective wholesale customer share among each of the 26 wholesale customers. This Tier Two allocation is based on a formula that takes into account multiple factors for each wholesale customer including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the wholesale customers collectively will be allocated among them in proportion to each wholesale customer's Allocation Basis, expressed in millions of gallons per day (mgd), which in turn is the weighted average of two components. The first component is the wholesale customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the

Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the wholesale customers for all available water supplies. The second component is accorded twice the weight of the first, fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain wholesale customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all wholesale customers' Allocation Bases to determine each wholesale customer's Allocation Factor. The final shortage allocation for each wholesale customer is determined by multiplying the amount of water available to the wholesale customers' collectively under the Tier One Plan, by the wholesale customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the wholesale customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each wholesale customer will also change. However, for long-term planning purposes, each wholesale customer shall use as its Allocation Factor, the value identified in the Tier Two Plan when adopted.

The current Tier Two Plan will expire in 2018 unless extended by the wholesale customers.

## 6.4 BURLINGAME SUPPLY RELIABILITY BY TYPE OF YEAR

*10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
*10631. (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:*
*(1) An average water year.*
*(2) A single dry water year.*
*(3) Multiple dry water years.*

Burlingame's available water supply volume by type of year is shown in Table 6-1.

A normal year is estimated as an averaged range of years that most closely represents the median water supply available to Burlingame. As discussed above, in accordance with the SFPUC's perpetual obligation to Burlingame's Supply Assurance, Burlingame has an Individual Supply Guarantee (ISG) of 5.23 million gallons per day (MGD), or approximately 1,909 million gallons (MG) per year. The SFPUC is obligated to provide Burlingame with up to 100% of Burlingame's ISG during normal years.

Dry-year supply estimates are based on the delivery estimates provided by BAWSCA and SFPUC as part of the 2015 Urban Water Management Plan (UWMP) update process (SFPUC, 2016; BAWSCA, 2016; Appendix G) and per hypothetical application of the Tier 1 and Tier 2 allocation processes described above. While these are the best available data for use at this

**Table 6-1**
**Basis of Water Year Data (DWR Table 7-1)**
City of Burlingame, California

| Year Type | Base Year (a) | Available Water Supplies if Year Repeats, 2020 to 2040 | | | |
|---|---|---|---|---|---|
| | | Volume Available to SFPUC Wholesale Customers (MGD) | Burlingame's Allocation Factor (b) | Volume Available to Burlingame (MGD) (b) | Annual Volume Available to Burlingame (MG) |
| Normal Year | FY 1987-88 | 184.0 | -- | 5.23 | 1,909 |
| Single Dry Year | FY 1989-90 | 152.6 | 2.3% | 4.46 | 1,628 |
| *Multiple Dry Years* | | | | | |
| Dry Year 1 | FY 1989-90 | 152.6 | 2.9% | 4.46 | 1,628 |
| Dry Year 2 | FY 1990-91 | 132.5 | 2.9% | 3.77 | 1,376 |
| Dry Year 3 | FY 1991-92 | 132.5 | 2.9% | 3.77 | 1,376 |

Abbreviations:
"BAWSCA" = Bay Area Water Supply and Conservation Agency
"DWR" = California Department of Water Resources
"MG" = million gallons
"MGD" = million gallons per day
"SFPUC" = San Francisco Public Utilities Commission

Notes:
(a) Base years and total deliveries to the SFPUC wholesale customers were obtained from Table 3 of Reference 1. A copy of Reference 1 is included in Appendix G.
(b) Water supply available to Burlingame during a normal year is assumed to be equal to Burlingame's ISG. Burlingame's allocation factor and the supply available to Burlingame during dry year types were provided by BAWSCA in Reference 2 (see Appendix G). The values were obtained per application of the Tier 1 and Tier 2 allocation processes described in the City's Water Supply Agreement and the BAWSCA Drought Implementation

References:
(1) SFPUC, 2016. Regional Water System Long-Term Supply Reliability 2015-2040, letter to BAWSCA, 5 January 2016.
(2) BAWSCA, 2016. UWMP Tier 2 Drought Implementation Plan Scenarios, email message to BAWSCA member agencies, dated

time, these supply reliability estimates do not take into account: (1) hydrologic data reflective of the recent historic drought of 2012-2015; (2) climate change impacts on the SFPUC RWS (see Section 6.7); and (3) potential delays in full completion of the Water System Improvement Program (WSIP) 2019 (see Section 6.2.1). These estimates further do not take into account the fact that the Tier 2 Plan will expire from its current form in 2018 unless the Wholesale Customers unanimously vote to extend it, and that, given the interdependencies built into the Tier 2 Plan, future drought allocations will be highly dependent on an agency's actual water use prior to the next drought and that of the other BAWSCA agencies.

As shown in Table 6-1, during single dry years between 2020 and 2040, the annual supply available to Burlingame is estimated to be reduced to 1,628 MG. During multiple dry years between 2020 and 2040, the annual supply available to Burlingame is estimated to be reduced to 1,628 MG during the first year of a multi-year drought and to 1,376 MG during the second and third years of a multi-year drought.

## 6.5 SUPPLY AND DEMAND ASSESSMENT

*10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.*

Burlingame's projected potable water demands are compared to potable water supply projections in normal years, single dry years, and multiple dry year periods, as presented in Tables 6-2 through 6-4. As described in Section 3.2.4, Burlingame's future water demand was estimated accounting for future water savings as result of implementation of Plumbing Code impacts (i.e., "passive" conservation).

As shown in Table 6-2, demand within the Burlingame service area is expected to slightly exceed Burlingame's ISG in a normal year by 2040, at which point a shortfall of 2% could potentially be experienced. As such, Burlingame is expected to have adequate water supplies during normal years to meet its projected demands up to approximately 2040.

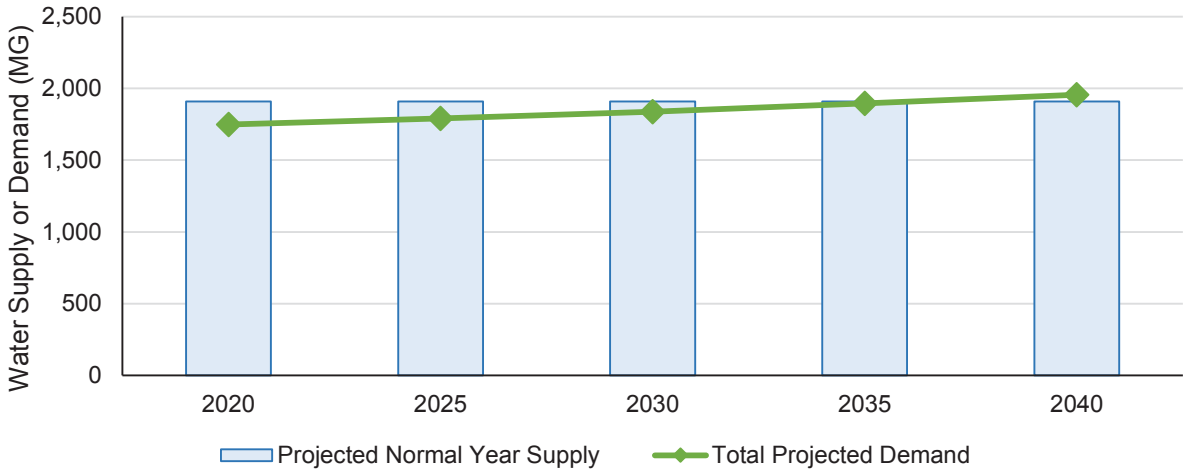
As shown in Table 6-3, during single-dry years, shortfalls of 7% to 17% could be experienced by Burlingame, if the projected water demands discussed in Section 3.2 are realized.

Beginning in 2020, it is projected that during multiple dry year periods, water supplies will be insufficient to meet total projected demands and water use cutbacks will be necessary. During the second and third years of a multiple dry year period, Burlingame's total annual water demand is estimated to exceed total annual supply by approximately 373 MG in 2020, which results in a projected total water supply shortfall of 21% (Table 6-4). This shortfall is projected to increase to approximately 580 MG by 2040, which results in a total water supply shortfall of 30% (Table 6-4).

**Table 6-2**
**Projected Supply Versus Demand for Normal Year Scenario (DWR Table 7-2)**
City of Burlingame, California

| | Estimated Supply and Demand (MG) (a) (b) | | | | |
|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 |
| Total Projected Supply | 1,909 | 1,909 | 1,909 | 1,909 | 1,909 |
| Total Projected Demand | 1,749 | 1,790 | 1,839 | 1,895 | 1,956 |
| *Surplus or Deficit* | *160* | *119* | *70* | *14* | *-47* |
| *Percent Shortfall* | *--* | *--* | *--* | *--* | *2%* |

**Normal Year Supply vs. Demand**

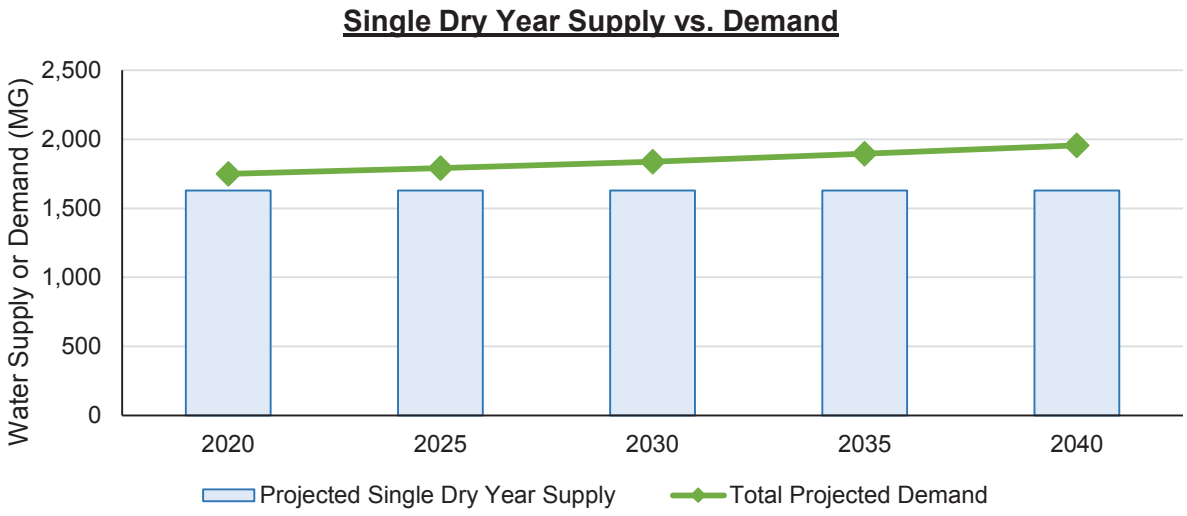



Abbreviations:
"DWR" = California Department of Water Resources
"ISG" = Individual Supply Guarantee
"MG" = million gallons

Notes:
(a) Projected available water supplies during normal years are assumed to be equal to Burlingame's ISG as listed in Table 6-1.
(b) Values for projected water demand are summarized in Table 3-3.

**Table 6-3**
**Projected Supply Versus Demand for Single Dry Year Scenario (DWR Table 7-3)**
City of Burlingame, California

| | Estimated Supply and Demand (MG) (a) (b) | | | | |
|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 |
| Total Projected Supply | 1,628 | 1,628 | 1,628 | 1,628 | 1,628 |
| Total Projected Demand | 1,749 | 1,790 | 1,839 | 1,895 | 1,956 |
| *Surplus or Deficit* | *-121* | *-162* | *-211* | *-267* | *-328* |
| *Percent Shortfall* | *7%* | *9%* | *11%* | *14%* | *17%* |

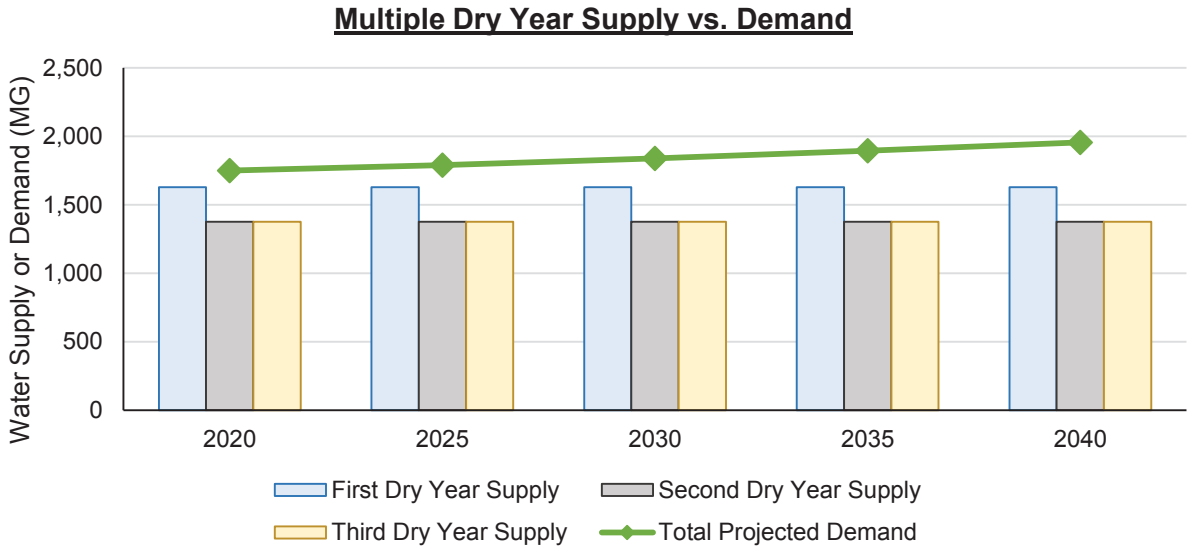



Abbreviations:
"DWR" = California Department of Water Resources
"MG" = million gallons

Notes:
(a) Projected available water supplies during single dry years are from Table 6-1.
(b) Values for projected water demand are summarized in Table 3-3.

**Table 6-4**
**Projected Supply Versus Demand for Multiple Dry Years Scenario (DWR Table 7-4)**
City of Burlingame, California

| | Estimated Supply and Demand (MG) (a) (b) | | | | |
|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 |
| *First Dry Year* | | | | | |
| Total Projected Supply | 1,628 | 1,628 | 1,628 | 1,628 | 1,628 |
| Total Projected Demand | 1,749 | 1,790 | 1,839 | 1,895 | 1,956 |
| *Surplus or Deficit* | *-121* | *-162* | *-211* | *-267* | *-328* |
| *Percent Shortfall* | *7%* | *9%* | *11%* | *14%* | *17%* |
| *Second Dry Year* | | | | | |
| Total Projected Supply | 1,376 | 1,376 | 1,376 | 1,376 | 1,376 |
| Total Projected Demand | 1,749 | 1,790 | 1,839 | 1,895 | 1,956 |
| *Surplus or Deficit* | *-373* | *-414* | *-462* | *-519* | *-580* |
| *Percent Shortfall* | *21%* | *23.1%* | *25%* | *27%* | *30%* |
| *Third Dry Year* | | | | | |
| Total Projected Supply | 1,376 | 1,376 | 1,376 | 1,376 | 1,376 |
| Total Projected Demand | 1,749 | 1,790 | 1,839 | 1,895 | 1,956 |
| *Surplus or Deficit* | *-373* | *-414* | *-462* | *-519* | *-580* |
| *Percent Shortfall* | *21%* | *23%* | *25%* | *27%* | *30%* |




Abbreviations:
"DWR" = California Department of Water Resources
"MG" = million gallons

Notes:
(a) Projected available water supplies during multiple dry years are from Table 6-1.
(b) Values for projected water demand are summarized in Table 3-3.

During years of projected shortfall, Burlingame expects to meet these shortfalls through implementation of its Water Shortage Contingency Plan (see Section 7). However, as discussed in Section 3.2.1, the demand projections included herein are relatively conservative (i.e., they assume no savings from active water conservation programs). To the extent that the total future demands are lower than those projected herein, the resultant supply shortage will likely be smaller. The actual, future shortfalls and corresponding need for water consumption cutbacks will depend upon the then-current water purchase relative to the projected supply.

## 6.6 WATER QUALITY IMPACTS ON RELIABILITY

*10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.*

As discussed in Section 5, the majority of the water supply to the SFPUC RWS is from the Hetch Hetchy Reservoir in the Sierra Nevada Mountains. The Hetch Hetchy Reservoir is considered a very high quality water source due to low total dissolved solid (TDS) concentrations and other factors. Additional water supplies from the Alameda and Peninsula sources come from areas with restricted access to protect the source water quality.

The SFPUC's Water Quality Division (WQD) regularly collects and tests water samples from reservoirs and designated sampling points throughout the RWS to ensure that the SFPUC's water meets or exceeds federal and state drinking water standards. In 2014, the WQD conducted more than 96,000 drinking water tests in the transmission and distribution systems. This monitoring effort is in addition to the extensive treatment process control monitoring performed by SFPUC's certified operators and online instruments. The SFPUC also has online instruments providing continuous water quality monitoring at numerous locations.

Additionally, the Burlingame collects water quality samples and monitors water quality within its own distribution system. Copies of the City of Burlingame 2014 Water Quality Report, which contains water quality sampling data from 2014, and the SFPUC 2014 water quality report are included as Appendix H. As can be seen in Appendix H, all of the analyzed constituents were detected at concentrations below the Maximum Contaminant Level (MCL), with the exception of naturally occurring total coliform, which occurred in May and July 2014.

The results of Burlingame's and SFPUC's water quality assessments show that SFPUC RWS watersheds have very low levels of contaminants, and that those contaminants that are found at low levels are associated with wildlife and, to a limited extent, human recreation. For the purposes of this UWMP, it is anticipated that this high-quality potable water source will continue to be available to Burlingame through the planning horizon ending in the year 2040. Water quality is expected to be similar for 2015, 2020, 2025, 2030, 2035, and 2040.

## 6.7 CLIMATE CHANGE IMPACTS TO SUPPLY

Information regarding the impacts of climate change to the SFPUC RWS supply was provided by BAWSCA in coordination with SFPUC and is provided verbatim below:

The issue of climate change has become an important factor in water resources planning in the State, and is frequently considered in urban water management planning purposes, though the extent and precise effects of climate change remain uncertain. There is convincing evidence that increasing concentrations of greenhouse gasses have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, observational data show that a warming trend occurred during the latter part of the 20th century and virtually all projections indicate this will continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, including impacts on the watersheds in the Bay Area:

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year;
- Changes in the timing, intensity and variability of precipitation, and an increased amount of precipitation falling as rain instead of as snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality and quantity;
- Sea level rise and an increase in saltwater intrusion;
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
- Increases in evaporation and concomitant increased irrigation need; and
- Changes in urban and agricultural water demand.

Both the SFPUC and BAWSCA participated in the 2013 update of the Bay Area Integrated Regional Water Management Plan (BAIRWMP), which includes an assessment of the potential climate change vulnerabilities of the region's water resources and identifies climate change adaptation strategies. In addition, the SFPUC continues to study the effect of climate change on the Regional Water System (RWS). These works are summarized below.

### 6.7.1 Bay Area Integrated Regional Water Management Plan

Climate change adaptation was established as an overarching theme for the 2013 BAIRWMP update. As stated in the BAIRWMP, identification of watershed characteristics that could potentially be vulnerable to future climate change is the first step in assessing vulnerabilities of water resources in the Bay Area Region (Region). Vulnerability is defined as the degree to which a system is exposed to, susceptible to, and able to cope with or adjust to, the adverse effects of climate change. A vulnerability assessment was conducted in accordance with the Department of Water Resources' (DWR's) Climate Change Handbook for Regional Water Planning and using the most current science available for the Region. The vulnerability assessment, summarized in the table below, provides the main water planning categories applicable to the Region and a general overview of the qualitative assessment of each category with respect to anticipated climate change impacts.

**Summary of BAIRWMP Climate Change Vulnerability Assessment**

| Vulnerability Areas | General Overview of Vulnerabilities |
|---|---|
| **Water Demand** | **Urban and Agricultural Water Demand** – Changes to hydrology in the Region as a result of climate change could lead to changes in total water demand and use patterns. Increased irrigation (outdoor landscape or agricultural) is anticipated to occur with temperature rise, increased evaporative losses due to warmer temperature, and a longer growing season. Water treatment and distribution systems are most vulnerable to increases in maximum day demand. |
| **Water Supply** | **Imported Water** – Imported water derived from the Sierra Nevada sources and Delta diversions provide 66 percent of the water resources available to the Region. Potential impacts on the availability of these sources resulting from climate change directly affect the amount of imported water supply delivered to the Region.<br><br>**Regional Surface Water** – Although future projections suggest that small changes in total annual precipitation over the Region will not change much, there may be changes to when precipitation occurs with reductions in the spring and more intense rainfall in the winter.<br><br>**Regional Groundwater** – Changes in local hydrology could affect natural recharge to the local groundwater aquifers and the quantity of groundwater that could be pumped sustainably over the long-term in some areas. Decreased inflow from more flashy or more intense runoff, increased evaporative losses and warmer and shorter winter seasons can alter natural recharge of groundwater. Salinity intrusion into coastal groundwater aquifers due to sea-level rise could interfere with local groundwater uses. Furthermore, additional reductions in imported water supplies would lead to less imported water available for managed recharge of local groundwater basins and potentially more groundwater pumping in lieu of imported water availability. |
| **Water Quality** | **Imported Water** – For sources derived from the Delta, sea-level rise could result in increases in chloride and bromide (a disinfection by-product (DBP) precursor that is also a component of sea water), potentially requiring changes in treatment for drinking water. Increased temperature could result in an increase in algal blooms, taste and odor events, and a general increase in DBP formation<br><br>**Regional Surface Water** – Increased temperature could result in lower dissolved oxygen in streams and prolong thermocline stratification in lakes and reservoirs forming anoxic bottom conditions and algal blooms.<br>Decrease in annual precipitation could result in higher concentrations of contaminants in streams during droughts or in association with flushing rain events. Increased wildfire risk and flashier or more |

| Vulnerability Areas | General Overview of Vulnerabilities |
|---|---|
| | intense storms could increase turbidity loads for water treatment.<br><br>**Regional Groundwater** – Sea-level rise could result in increases in chlorides and bromide for some coastal groundwater basins in the Region. Water quality changes in imported water used for recharge could also impact groundwater quality. |
| **Sea-Level Rise** | Sea-level rise is additive to tidal range, storm surges, stream flows, and wind waves, which together will increase the potential for higher total water levels, overtopping, and erosion.<br><br>Much of the bay shoreline is comprised of low-lying diked baylands which are already vulnerable to flooding. In addition to rising mean sea level, continued subsidence due to tectonic activity will increase the rate of relative sea-level rise.<br><br>As sea-level rise increases, both the frequency and consequences of coastal storm events, and the cost of damage to the built and natural environment, will increase. Existing coastal armoring (including levees, breakwaters, and other structures) is likely to be insufficient to protect against projected sea-level rise. Crest elevations of structures will have to be raised or structures relocated to reduce hazards from higher total water levels and larger waves. |
| **Flooding** | Climate change projections are not sensitive enough to assess localized flooding, but the general expectation is that more intense storms would occur thereby leading to more frequent, longer and deeper flooding.<br><br>Changes to precipitation regimes may increase flooding.<br><br>Elevated Bay elevations due to sea-level rise will increase backwater effects exacerbating the effect of fluvial floods and storm drain backwater flooding. |
| **Ecosystem and Habitat** | Changes in the seasonal patterns of temperature, precipitation, and fire due to climate change can dramatically alter ecosystems that provide habitats for California's native species. These impacts can result in species loss, increased invasive species ranges, loss of ecosystem functions, and changes in vegetation growing ranges.<br><br>Reduced rain and changes in the seasonal distribution of rainfall may alter timing of low flows in streams and rivers, which in turn would have consequences for aquatic ecosystems. Changes in rainfall patterns and air temperature may affect water temperatures, potentially affecting coldwater aquatic species. |

| Vulnerability Areas | General Overview of Vulnerabilities |
|---|---|
| | Bay Area ecosystems and habitat provide important ecosystem services, such as: carbon storage, enhanced water supply and quality, flood protection, food and fiber production. Climate change is expected to substantially change several of these services.<br><br>The region provides substantial aquatic and habitat-related recreational opportunities, including: fishing, wildlife viewing, and wine industry tourism (a significant asset to the region) that may be at risk due to climate change effects. |
| **Hydropower** | Currently, several agencies in the Region produce or rely on hydropower produced outside of the Region for a portion of their power needs. As the hydropower is produced in the Sierra, there may be changes in the future in the timing and amount of energy produced due to changes in the timing and amount of runoff as a result of climate change.<br><br>Some hydropower is also produced within the region and could also be affected by changes in the timing and amount of runoff. |

Source: 2013 Bay Area Integrated Regional Water Management Plan (BAIRWMP), Table 16-3.

### 6.7.2 SFPUC Climate Change Studies

The SFPUC views assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. Climate change research by the SFPUC began in 2009 and continues to be refined. In its 2012 report "Sensitivity of Upper Tuolumne River Flow to Climate Change Scenarios," the SFPUC assessed the sensitivity of runoff into Hetch Hetchy Reservoir to a range of changes in temperature and precipitation due to climate change. Key conclusions from the report include the following:

- With differing increases in temperature alone, the median annual runoff at Hetch Hetchy would decrease by 0.7-2.1 percent from present-day conditions by 2040 and by 2.6-10.2 percent from present-day by 2100. Adding differing decreases in precipitation on top of temperature increases, the median annual runoff at Hetch Hetchy would decrease by 7.6-8.6 percent from present-day conditions by 2040 and by 24.7-29.4 percent from present-day conditions by 2100.

- In critically dry years, these reductions in annual runoff at Hetch Hetchy would be significantly greater, with runoff decreasing up to 46.5 percent from present day conditions by 2100 utilizing the same climate change scenarios.

- In addition to the total change in runoff, there will be a shift in the annual distribution of runoff. Winter and early spring runoff would increase and late spring and summer runoff would decrease.

- Under all scenarios, snow accumulation would be reduced and snow would melt earlier in the spring, with significant reductions in maximum peak snow water equivalent under most scenarios.

Currently, the SFPUC is planning to conduct a comprehensive assessment of the potential effects of climate change on water supply. The assessment will incorporate an investigation of new research on the current drought and is anticipated to be completed in late 2016 or early 2017.

## 6.8 WATER MANAGEMENT TOOLS

Per California Water Code Section 10631 (c)(2), water suppliers are required to describe the management strategies that have been, or will be, employed to address the constraints on water sources. The supply versus demand assessment presented in Section 6.5 indicates that, based on the delivery estimates of the SFPUC wholesale water and Burlingame's future water demand estimates, by 2040, Burlingame could be facing up to a 30% supply shortfall during the second and third years of a multiple dry year period.

It should be noted that Burlingame's future water demands have been prepared based on conservative assumptions as described in Sections 3.2.1 and 3.2.4. In addition, to the extent that the projected population and/or employment growth are not realized, the total future potable demands of the Burlingame service area would be expected to be less and therefore the resultant supply shortage will likely be smaller. Additionally, Burlingame has been implementing, and plans to continue to implement, the demand management measures described in Section 8.

At a regional level, the Burlingame maintains active involvement in work that BAWSCA and the SFPUC are doing with respect to BAWSCA's Long Term Reliable Water Supply Strategy (see Section 6.1) and SFPUC's Water Management Action Plan, including supporting the investigation and pursuit of additional water supplies.

Further, in response to anticipated future dry-year shortfalls, Burlingame has developed a robust Water Shortage Contingency Plan that systematically identifies ways in which Burlingame can reduce water demands and augment supplies during dry years. The Water Shortage Contingency Plan is included in the following Section 7.

# 7. WATER SHORTAGE CONTINGENCY PLANNING

This section presents the City of Burlingame's (the City's or Burlingame's) Water Shortage Contingency Plan (WSCP), which has been developed to serve as a flexible framework of planned response measures to mitigate future water supply shortages. This WSCP builds upon and supersedes the WSCP that was presented in the 2010 Urban Water Management Plan (UWMP). The updated WSCP presented herein reflects lessons learned during the recent historic drought and is intended to improve Burlingame's ability to respond effectively and efficiently in the event of a future water supply shortage or emergency.

The City has authority within Chapter 15.06 - Water Shortage Emergencies of the City of Burlingame Municipal Code to require water rationing and conservation and to enforce penalties. Burlingame Municipal Code Chapter 15.06 is included as Appendix I of this UWMP.

## 7.1 GUIDING PRINCIPLE

Burlingame developed this WSCP based on the following guiding principle:

> *This WSCP concentrates on the reduction of non-essential water uses such as landscape irrigation and other discretionary outdoor water use and gives the highest priority to preserving water uses that are essential to the health, safety, welfare, and economic vitality of Burlingame's customers.*

Practically, this principle guides Burlingame to ask for a shared contribution from all of its customers towards meeting water reduction goals during periods of water shortage. It further directs Burlingame to focus its water conservation efforts on reducing discretionary water uses such as outdoor irrigation, while attempting to minimize economic and other impacts to its residential and commercial customers.

## 7.2 METHODOLOGY

To assist in development of the WSCP, Burlingame used the Drought Response Tool (DRT)[20], an Excel spreadsheet model. The DRT provides a quantitative framework that allowed Burlingame to:

- Evaluate a pre-drought baseline water use by each water use sector and major end use (i.e., indoor versus outdoor water use);
- Identify water use sectors and end uses to target for water savings;
- Evaluate a menu of drought response actions to implement in each stage of action; and
- Estimate the water savings potential of the responses selected for each stage of action based on assumed implementation and water savings rates.

Data inputs to the DRT are largely consistent with data that has been reported herein and to the State Water Resources Control Board (SWRCB) in response to Resolution 2015-0032 via the DRINC Portal (www.drinc.ca.gov), including total production, residential water use and

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population. The Drought Response Actions section of the DRT is designed to be highly modifiable, in order to allow users to explore the potential water savings associated with implementing different sets of actions, based on varying levels of implementation, and their understanding of their own community and the water savings potential. A detailed Drought Response Tool User's Guide is provided in Appendix J, which walks the user through the model structure, and the key input parameters, assumptions and calculations that form the basis for the DRT.

## 7.3 PRIOR DROUGHT ACTIONS

Burlingame has historically developed different strategies for reducing water demand during water shortages such as the severe droughts that occurred in California between 1976 and 1977 and again between 1987 and 1992. In response to these droughts Burlingame's City Council (City Council) adopted the Water Rationing Ordinance (No. 1101) in 1977 and Water Rationing Plan Resolution 49-92 (WRPR) in 1992. During both the 1976-1977 and 1987-1992 droughts, Burlingame adopted specific rules that required water-saving actions and prohibited water-wasting activities. In 1992, these rules were accompanied by specific water use allocations for each customer. The water use allocation system employed in 1992 was based on a per capita water use for single family residential customers and a percentage reduction for multifamily and non-residential customers. These ordinances and resolutions are discussed further below.

### 7.3.1 Ordinance 1101

The State of California experienced extremely dry years between 1976 and 1977 when runoff in the Sacramento and San Joaquin Valleys averaged 37% and 26% of normal, respectively. To help mitigate the effects of the drought, the City Council enacted Ordinance 1011 in April 1977 to achieve a 28% reduction in water use, City-wide. Ordinance 1011 focused on adopting specific rules to require water-saving practices and prohibit water-wasting activities. Some of the rules required by the Ordinance 1011 included:

- Repairing broken or defective plumbing, sprinklers, watering, or irrigation equipment immediately;
- Reducing irrigation of lawns, gardens, playfields, parks, median strips, golf courses, cemeteries, and landscaping of any type by at least 50% compared to the same billing period in the previous year;
- Eliminating new irrigation services and expansion of existing irrigation facilities;
- Eliminating use of water that flooded or ran off in gutters or streets;
- Eliminating the use of hoses to wash vehicles or building surfaces or parts;
- Eliminating filling any new or existing swimming pools with water;
- Eliminating use of hoses for cleaning sidewalks, driveways, patios, parking lots, etc.;
- Requiring all new construction to include water saving devices in interior plumbing fixtures and minimize landscaping;
- Eliminating use of water in decorative fountains;
- Requiring restaurants to serve water to customers only upon request; and

- Using reclaimed water for construction water purposes.

Ordinance 1011 was enforced by the City until 1978 when increased precipitation ended to the drought.

### 7.3.2 Water Rationing Plan Resolution No. 49-92

Almost a decade after the 1976-1977 drought event, the City was faced again with extreme dry conditions. The 1987-1992 drought was notable for the six-year duration of significantly below-average runoff flows and the statewide nature of the drought impacts (runoff in the Sacramento and San Joaquin Valleys averaged 56% and 47% of normal, respectively). Statewide reservoir storage was approximately 40% of average by the third year of the drought and did not return to average conditions until 1994.

The 1987-1992 drought required that the City reduce water demands by 34% at the peak of the drought in 1991 (from 5.0 MGD to 3.3 MGD). To achieve this water demand reduction, WRPR 49-92 mandated the implementation of conservation measures and prohibited the use of potable water for certain activities, similar to those adopted by Ordinance 1011. In addition to these conservation measures however, WRPR 49-92 also assigned a water use allocation for each customer based on a per capita water use for single family residential customers and a percentage reduction for multifamily and non-residential customers.

Each single family dwelling was allocated 100 gallons per day (GPD) for the first inhabitant, 70 GPD each for the second, third, or fourth inhabitants, and 50 GPD for each additional inhabitant. Service connections with landscaping received allocations based on the landscape area, including 50 GPD for lots under 10,000 square feet, 150 GPD for lots exceeding 10,000 square feet but less than ¾ acre, and between 150 to 300 GPD for lots larger than ¾ acre. For all other accounts (e.g., multifamily residential, commercial, industrial, institutional, and irrigation), the percent reductions required varied seasonally and by customer category. Irrigation accounts were required to cut back 50% during both the summer and winter months. Institutional accounts were cutback 25% during all seasons. Commercial, industrial and hotel accounts without food services were required to reduce water usage by 25% during the summer and by 15% in winter months, while food-related commercial accounts were cutback 20% in the summer and 10% in the winter. Multifamily residential customers were required to reduce water use by 15% during the summer and 7% during winter months.

## 7.4 BASELINE WATER USE PROFILE

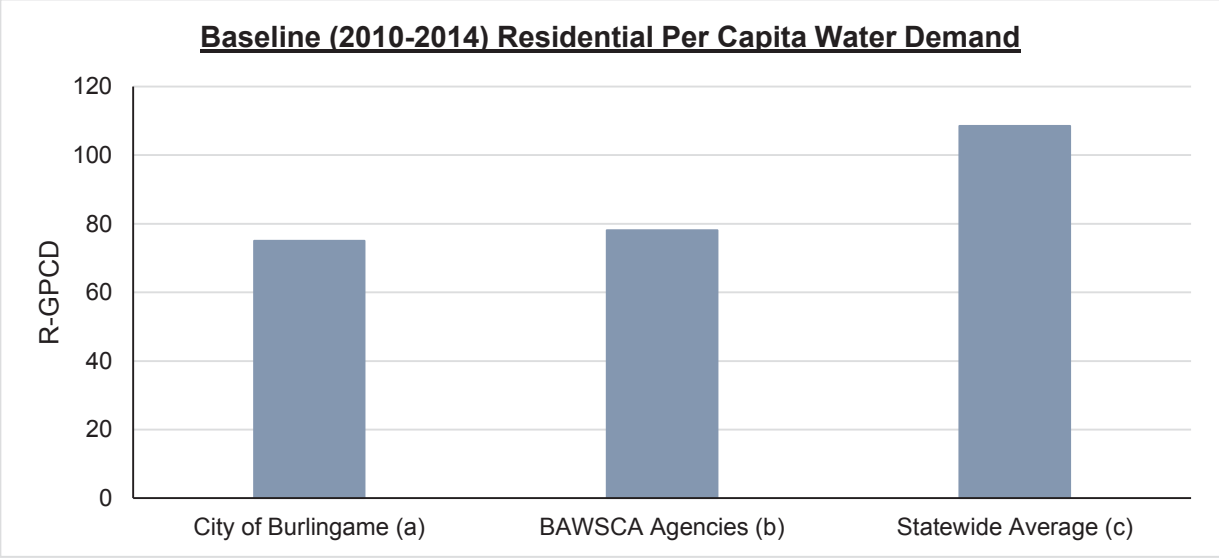
Using the DRT, Burlingame developed a pre-drought baseline water use profile that reflected usage patterns within the Burlingame service area by major water use sector between 2010 and 2014 (selected as a representative “pre-drought” period) and that was used to guide development of the WSCP. Key findings from this analysis are presented below.

*Residential Per Capita Demand*

The City’s baseline residential gallons per capita per day (R-GPCD) demand between 2010 and 2014 was approximately 75 R-GPCD. As shown in Table 7-1 and associated chart, this R-GPCD is very consistent the average Bay Area Water Supply and Conservation Agency-

**Table 7-1**
**Baseline (2010-2014) Residential Per Capita Water Demand**
City of Burlingame, California

| | Baseline Residential Per Capita Water Demand (R-GPCD) |
|---|---|
| City of Burlingame (a) | 75 |
| BAWSCA Agencies (b) | 78 |
| Statewide Average (c) | 109 |




Abbreviations:
BAWSCA = Bay Area Water Supply and Conservation Agency
R-GPCD = residential gallons per capita per day

Notes:
(a) Average Burlingame R-GPCD from 2010 through 2014 calculated using metering data.
(b) Average BAWSCA R-GPCD from 2010 through 2014 calculated from data provided in Reference 1.
(c) Average state-wide R-GPCD for 2013 calculated using state-wide residential water use and population provided in Reference 2.

Reference:
(1) BAWSCA, 2015. *Bay Area Water Supply and Conservation Agency FY 2013-2014 Annual Survey* , May 2015.
(2) California State Water Resources Control Board Water Conservation Portal - Conservation Reporting http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.shtml accessed 3 March 2016.

(BAWSCA-) wide average of 78 R-GPCD, but is significantly less that the 2013 statewide average of 109 R-GPCD.[21]

*Estimated Proportion of Outdoor Water Use*

As shown on Table 7-2 and the associated charts, outdoor water use, which can generally be considered as a "discretionary water use", was estimated to be approximately 24% of the Burlingame's total consumption during this pre-drought time period. Notably, dedicated irrigation meters accounted for approximately 20% of the total estimated irrigation demand, indicating that approximately 80% of outdoor water use is not metered with a separate meter, and is therefore more difficult to track and directly target.

The DRT estimates indoor water use to be equivalent to the lowest monthly water use for each sector, accounting for the number of days in each month. Outdoor water use for each sector was estimated to be the difference between the total water use and the estimated indoor water use. Using this method, the total proportion of estimated outdoor water use for other BAWSCA water agencies is typically on the order of 40% of overall demand. If Burlingame customers tend to irrigate more heavily during winter months, an underestimation of the proportion of outdoor water use would occur.

The proportion of outdoor water use within residential and commercial sectors is estimated to be 25% and 15%, respectively. This indicates that there is the potential to achieve significant water savings across these sectors, simply by focusing on outdoor uses. If the proportion of outdoor water use is being underestimated by the DRT method, then even more substantial savings may be achieved through targeting outdoor water use. As further shown in Table 7-2 and the associated charts, the seasonal variation in baseline water use reflects increased irrigation demands during the summer and fall months. Therefore, the greatest potential for reductions in non-essential water use is expected during these months.

*Historical Drought Response*

As described below, water savings achieved by Burlingame during 2015 in response to the recent, historic drought support the findings of the baseline water use profile (i.e., that discretionary uses can be targeted to achieve significant water savings).

On 1 April 2015, Governor Brown issued the fourth in a series of Executive Orders regarding actions necessary to address California's severe drought conditions. Executive Order B-29-15 directed the SWRCB to impose the first ever mandatory restrictions on urban water suppliers to achieve a statewide 25% reduction in potable urban water usage through February 2016.[22] The Executive Order also required commercial, industrial, and institutional (CII) users to implement water efficiency measures, prohibited irrigation with potable water of ornamental turf in public street medians, and prohibited irrigation with potable water outside newly constructed homes

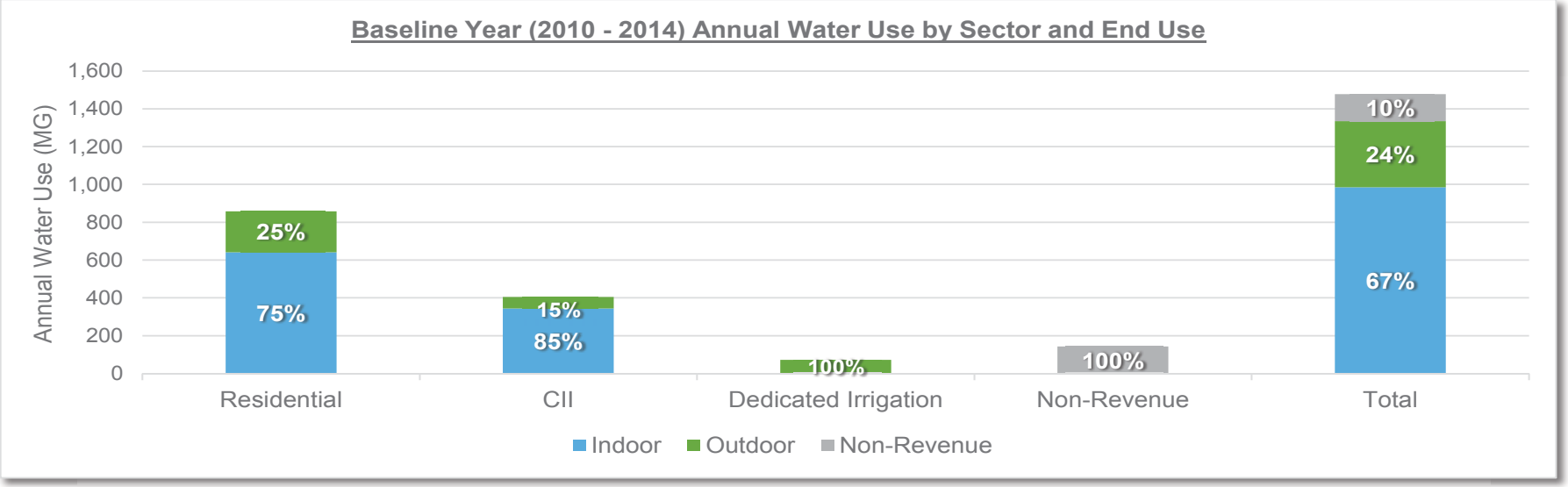
[21] Average state-wide R-GPCD for 2013 calculated using state-wide residential water use and population provided by California State Water Resources Control Board Water Conservation Portal - Conservation Reporting, http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/conservation_reporting.shtml, accessed 3 March 2016.

[22] Executive Order B-29-15 located online at https://www.gov.ca.gov/docs/11.13.15_EO_B-36-15.pdf, accessed 2 March 2016.

**Table 7-2**
**Baseline (2010-2014) Water Use Profile**
City of Burlingame, California

| Sector | End-Use | Baseline (2010-2014) Average Water Use (MG) (a) | | | | | | | | | | | | | Annual % of Total by Sector |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | January | February | March | April | May | June | July | August | September | October | November | December | Annual | |
| Residential | Indoor (b) | 55 | 49 | 55 | 53 | 55 | 53 | 55 | 55 | 53 | 55 | 53 | 55 | 642 | 75% |
| | Outdoor (b) | 6 | 8 | 0 | 1 | 4 | 17 | 28 | 38 | 41 | 35 | 27 | 13 | 217 | 25% |
| | *Subtotal Residential* | *60* | *57* | *55* | *53* | *58* | *70* | *82* | *93* | *94* | *89* | *80* | *68* | *858* | - |
| CII | Indoor (b) | 29 | 26 | 29 | 28 | 29 | 28 | 29 | 29 | 28 | 29 | 28 | 29 | 343 | 85% |
| | Outdoor (b) | 0.5 | 3 | 0 | 2 | 1 | 7 | 8 | 11 | 12 | 8 | 8 | 1 | 62 | 15% |
| | *Subtotal CII* | *30* | *29* | *29* | *30* | *30* | *36* | *37* | *40* | *41* | *38* | *36* | *31* | *405* | - |
| Dedicated Irrigation | Outdoor | 3 | 2 | 2 | 3 | 3 | 8 | 9 | 10 | 11 | 9 | 8 | 4 | 72 | 100% |
| Non-Revenue | Non-Revenue | 9 | 8 | 8 | 8 | 8 | 11 | 14 | 17 | 17 | 16 | 15 | 12 | 143 | 100% |
| Total | Indoor | 84 | 76 | 84 | 81 | 84 | 81 | 84 | 84 | 81 | 84 | 81 | 84 | 985 | 67% |
| | Outdoor | 9 | 12 | 2 | 5 | 8 | 32 | 44 | 59 | 64 | 52 | 43 | 18 | 350 | 24% |
| | Non-Revenue | 9 | 8 | 8 | 8 | 8 | 11 | 14 | 17 | 17 | 16 | 15 | 12 | 143 | 9.7% |
| | **Total** | **102** | **96** | **93** | **94** | **100** | **124** | **142** | **160** | **163** | **152** | **139** | **114** | **1,478** | - |

**Table 7-2 (Continued)**
**Baseline (2010-2014) Water Use Profile**
City of Burlingame, California



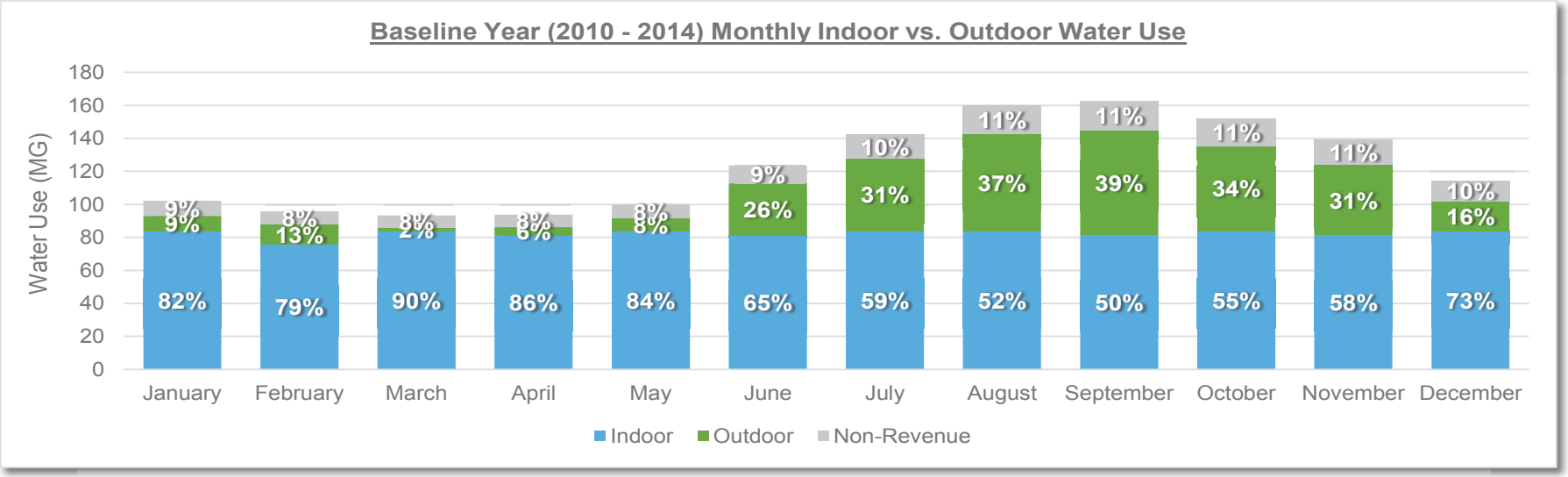



**Table 7-2 (Continued)**
**Baseline (2010-2014) Water Use Profile**
City of Burlingame, California

Abbreviations:
CII = commercial, industrial, and institutional
MG = million gallons

Notes:
(a) Baseline water use is calculated using the average of Burlingame's metering data from 2010 through 2014 for each sector. To adjust for Burligame's bimonthly billing cycle, a two-month rolling average is used.
(b) Indoor water use was estimated to be the lowest monthly water use for each sector, accounting for the number of days in each month. Outdoor water use for each sector was estimated to be the difference between the total water use and the estimated indoor water use.

and buildings that is not delivered by drip or microspray systems, along with numerous other directives.

On 5 May 2015, the SWRCB adopted Resolution 2015-0032 that mandated minimum actions by water suppliers and their customers to conserve water supplies into 2016 and assigned a mandatory water conservation savings goal to each water supplier based on their R-GPCD. The Office of Administrative Law approved the regulations and modified the California Water Code (CWC) on 18 May 2015. On 2 February 2016, the SWRCB voted to extend the emergency regulations until October 2016 with some modifications.[23] On 9 May 2016, the Governor issued Executive Order B-37-16, which, among other things, directed the SWRCB to make certain water use restrictions permanent. On 18 May 2016, the SWRCB adopted regulations in response to the Executive Order that will further adjusted the water conservation savings goal, and extended the regulations until January 2017.

The mandatory conservation standards included in CWC Section 865(c) range from 8% for suppliers with an R-GPCD below 65 R-GPCD, up to 36% for suppliers with an R-GPCD of greater than 215 GPCD. As with previous the emergency drought regulations adopted by the SWRCB in 2014, the new water conservation regulation was primarily intended to reduce outdoor urban water use. Based on their R-GPCD, Burlingame was required to reduce water use by 16% relative to its 2013 water use. During the June 2015 through December 2015 compliance period, Burlingame well surpassed its water use reduction target, with a cumulative savings of 30.8% relative to its 2013 use.

As shown in Table 7-3, Burlingame surpassed its SWRCB-mandated water use reduction target in 2015 largely due to the high savings (up to a 37% reduction in total demand) achieved during the summer and fall months, likely corresponding to large cut-backs in irrigation water use.

## 7.5 STAGES OF ACTION

> *10632. (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier: (1) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.*

Based on lessons learned during the recent, historic drought, and based on projections of future dry-year shortfalls (see Section 6.5), Burlingame updated the stages of action to be taken in response to water supply shortages. This WSCP establishes five stages of increasingly restrictive actions to be implemented to respond to water supply reductions, including a 50% supply reduction as required by CWC Section 10632(a). Table 7-4 summarizes the water supply reductions and supply conditions associated with each stage of action.

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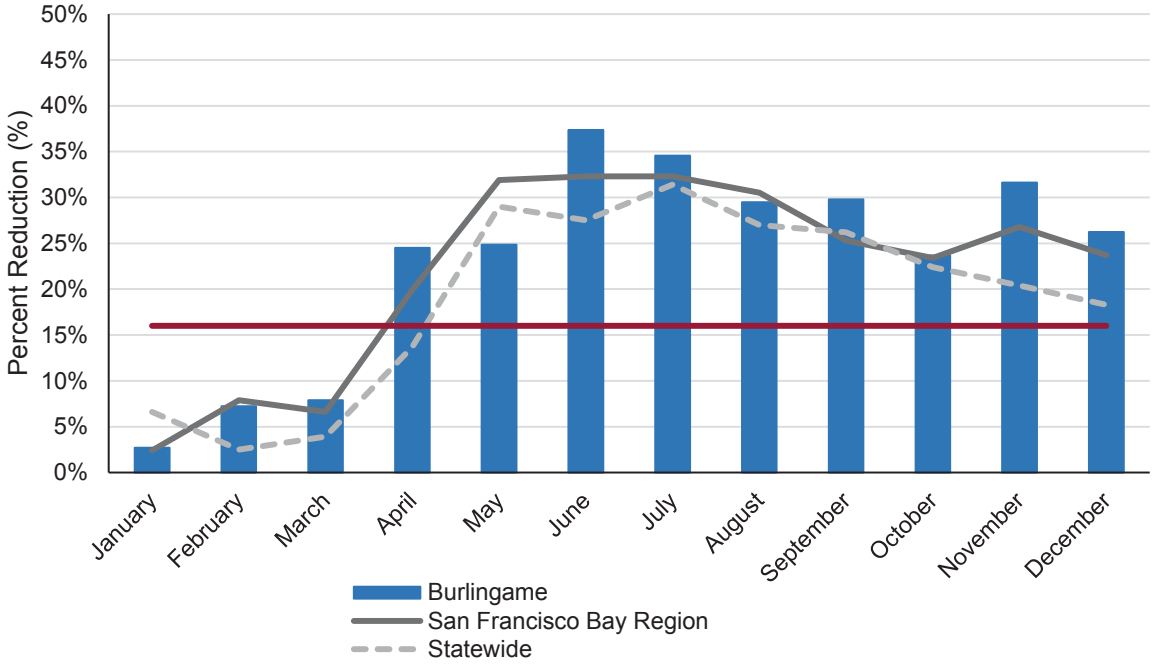
[23] Adopted text of the extend Emergency Regulations located online at http://www.waterboards.ca.gov/water_issues/programs/conservation_portal/docs/emergency_reg/final_reg_enacted.pdf accessed on 2 March 2016

**Table 7-3**
**2015 Water Use Reductions**
City of Burlingame, California

| | CY2015 Monthly Water Savings From CY2013 Baseline | | |
|---|---|---|---|
| | Burlingame | San Francisco Bay Region | Statewide |
| January | 2.7% | 2.4% | 6.6% |
| February | 7.2% | 7.9% | 2.5% |
| March | 7.9% | 6.6% | 3.9% |
| April | 24.5% | 19.9% | 13.7% |
| May | 24.8% | 31.9% | 29.0% |
| June | 37.4% | 32.3% | 27.5% |
| July | 34.6% | 32.3% | 31.4% |
| August | 29.5% | 30.5% | 27.0% |
| September | 29.8% | 25.3% | 26.2% |
| October | 23.7% | 23.4% | 22.4% |
| November | 31.6% | 26.8% | 20.4% |
| December | 26.2% | 23.7% | 18.3% |

**Monthly Water Use Reduction for CY2015 Compared to CY2013 Baseline**




Abbreviations:
CY = calendar year

References:
DRINC Portal (http://drinc.ca.gov/) Urban Water Supplier Monitoring Reports, February 2016.
Fact Sheet, December 2015 Statewide Conservation Data, State Water Resources Control Board.
SWRCB Water Conservation Portal, (http://www.waterboards.ca.gov/water_issues/programs /conservation_portal/conservation_reporting.shtml), accessed 11 March 2016.

**Table 7-4**
**Stages of Water Shortage Contingency Plan (DWR Table 8-1)**
City of Burlingame, California

| Stage | Percent Supply Reduction | Rationale for Stage of Action | Water Supply Condition |
|---|---|---|---|
| 1 | N/A | Mandatory prohibitions to prevent water waste | In force at all times. |
| 2 | Up to 5% | Intermediate stage | Declaration by Burlingame City Council in accordance with Chapter 15.06 of the Burlingame Municipal Code or upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 5% due to water supply shortages or an emergency. |
| 3 | Up to 15% | SFPUC called for voluntary 10% rationing in 2007-2009 and 2014-2015; Burlingame's 2015 SWRCB mandatory water reduction target is 16%; SFPUC system supplies can be reduced by 20% | Declaration by Burlingame City Council in accordance with Chapter 15.06 of the Burlingame Municipal Code or upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 6% to 15% due to water supply shortages or emergency. |
| 4 | Up to 30% | SFPUC system supplies can be reduced by 20%; Multiple dry year shortfalls projected up to 30% | Declaration by Burlingame City Council in accordance with Chapter 15.06 of the Burlingame Municipal Code or upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 16% to 30% due to water supply shortages or emergency. |
| 5 | Up to 50% | Required by UWMP Act | Declaration by Burlingame City Council in accordance with Chapter 15.06 of the Burlingame Municipal Code or upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 31% to 50% due to water supply shortages or emergency. |

Abbreviations:
SFPUC = San Francisco Public Utilities Commission
SWRCB = State Water Resources Control Board

As shown in Table 7-4, Stage 1 includes mandatory prohibitions that are in force at all times with the intent to eliminate water waste. Each subsequent stage of the WSCP is implemented with a formal declaration by the Burlingame City Council upon the determination that the San Francisco Public Utilities Commission (SFPUC) or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use due to a water supply shortage or emergency.

Table 7-5 describes the costumer restrictions and prohibitions and consumption reduction methods (i.e., the actions to be taken by Burlingame staff) associated with each stage of action. Specific prohibitions and consumption reduction methods are discussed in more detail below. The monthly and cumulative annual water savings impacts associated with each restriction, prohibition and consumption reduction method were quantitatively estimated using the DRT for each stage of action, see Appendix K.

## 7.6 PROHIBITIONS ON END USES

*10632. (a) (4) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.*

Burlingame has the authority to restrict or prohibit specific water use practices during water shortages (Chapter 15.06 of the City of Burlingame Municipal Code). Restrictions and prohibitions associated with each stage of action are presented in Table 7-5. As discussed above, these responses focus on the reduction of non-essential water uses such as ornamental landscape irrigation, and preserve water uses that are essential to the health, safety, welfare, and economic vitality of Burlingame's customers. In addition, several mandatory prohibitions are enforced at all times as part of Stage 1 to eliminate water waste. Together, the prohibitions listed in Stages 1 and 2 include each of the prohibitions on end uses mandated by the SWRCB in its 2015 emergency regulations. Prohibitions in subsequent stages go beyond the SWRCB requirements and become increasingly restrictive.

### 7.6.1 Defining Water Features

*10632. (b) Commencing with the urban water management plan update due July 1, 2016, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.*

As required by CWC Section 10632, Burlingame distinguishes between "decorative water features" such as ponds, lakes, and fountains that are artificially supplied with water and "recreational water features" such as swimming pools and spas. Prohibitions on water use for decorative water features are listed separately from those for recreational water features (see Table 7-5).

**Table 7-5**
**Stages of Action and Water Shortage Responses**
City of Burlingame, California

| Stage | Consumption Reduction Methods by Water Supplier (a) | Restrictions and Prohibitions on End Uses (Customers) (a) |
|---|---|---|
| **Stage 1 – Mandatory Prohibitions**<br><br>**Goal: N/A** | N/A | • Hoses must be equipped with a shut-off valve for washing vehicles, sidewalks, walkways, or buildings.<br>• Broken or defective plumbing and irrigation systems must be repaired or replaced within a reasonable period.<br>• Potable water shall not be used to water outdoor landscapes in a manner that causes runoff onto non-irrigated areas, walkways, roadways, parking lots, or other hard surfaces.<br>• Potable water cannot be applied to outdoor landscapes during and up to 48 hours after measurable rainfall.<br>• Potable water shall not be applied in any manner to any driveway or sidewalk, except when necessary to address immediate health or safety concerns.<br>• Irrigation with potable water of ornamental turf on public street medians is prohibited.<br>• Use only re-circulated or recycled water to operate ornamental fountains.<br>• Restaurants and other food service operations shall serve water to customers only upon request.<br>• Hotels and motels shall provide guests an option whether to launder towels and linens daily. Hotels and motels shall prominently display notice of this option in each bathroom using clear and easily understood language.<br>• Other measures as may be approved by Resolution of the City Council. |
| **Stage 2 –**<br><br>**Goal: up to 5% Reduction** | • Inform customers that there is a water shortage emergency and the list of actions they can take to reduce water use (e.g., via direct mail, bill inserts, etc.).<br>• Increase public outreach, including information regarding fines or penalties for non-compliance.<br>• Conduct coordination with BAWSCA and SFPUC. Conduct in-house training so City staff are prepared to respond to customer calls, reports and complaints, and to support enforcement actions. | • Continue with actions and measures from Stage 1 except where superseded by more stringent requirements.<br>• Residential and commercial landscape irrigation with potable water is prohibited between the hours of 8:00 a.m. and 6:00 p.m.<br>• Residential and commercial landscape irrigation with potable water is limited to no more than three (3) days per week on a schedule established by the Director and posted on the City's website.<br>• Other measures as may be approved by Resolution of the City Council. |

**Table 7-5 (Continued)**
**Stages of Action and Water Shortage Responses**
City of Burlingame, California

| Stage | Consumption Reduction Methods by Water Supplier (a) | Restrictions and Prohibitions on End Uses (Customers) (a) |
|---|---|---|
| **Stage 3**<br><br>**Goal: up to 15% Reduction** | • Continue with actions and measures from Stage 2.<br>• Increase public outreach, including a dedicated customer service hotline.<br>• Schedule staff for enforcement and customer service, including on weekends. May include hiring additional, temporary staff.<br>• Reduce frequency of water main flushing.<br>• Inform local fire department of water supply status and request cooperation in reducing of fire training exercises that use water.<br>• Evaluate potential implementation of drought surcharge on water rates.<br>• Suspend issuance of building permits for new residential pools, spas, and hot tubs. | • Continue with actions and measures from Stages 1 and 2 except where superseded by more stringent requirements.<br>• Irrigation with potable water outside of newly constructed homes and buildings not delivered by drip or microspray is prohibited.<br>• Potable water shall not be used for street cleaning.<br>• Pools, spas, and hot tubs shall be covered when not in use.<br>• Prohibit installation of single-pass cooling systems<br>• Residential and commercial landscape irrigation with potable water is prohibited between the hours of 8:00 a.m. and 6:00 p.m. and for more than fifteen (15) minutes per day per zone.<br>• Residential and commercial landscape irrigation with potable water is limited to no more than two (2) days per week on a schedule established by the Director and posted on the City's website.<br>• Other measures as may be approved by Resolution of the City Council. |
| **Stage 4**<br><br>**Goal: up to 30% Reduction** | • Continue with actions and measures from Stages 2 and 3.<br>• Increase public outreach, including hosting public events and workshops.<br>• Increase enforcement and water waste patrols.<br>• Suspend routine flushing of water mains.<br>• Convert to more frequent water reading and billing.<br>• Offer water use surveys to the top 10% of commercial, industrial, and institutional water users.<br>• Develop water budgets for new water service accounts and notice those accounts appropriately. | • Continue with actions and measures from Stages 1, 2 and 3 except where superseded by more stringent requirements.<br>• No new turf shall be installed at new construction sites.<br>• Prohibit vehicle washing except at facilities using recycled or recirculating water.<br>• Residential and commercial landscape irrigation with potable water is prohibited between the hours of 8:00 a.m. and 6:00 p.m. and for more than ten (10) minutes per day per zone.<br>• Residential and commercial landscape irrigation with potable water is limited to no more than one (1) day per week on a schedule established by the Director and posted on the City's website.<br>• Water budgets established for new water service accounts.<br>• Other measures as may be approved by Resolution of the City Council. |

**Table 7-5 (Continued)**
**Stages of Action and Water Shortage Responses**
City of Burlingame, California

| Stage | Consumption Reduction Methods by Water Supplier (a) | Restrictions and Prohibitions on End Uses (Customers) (a) |
|---|---|---|
| **Stage 5**<br><br>**Goal: up to 50% Reduction** | • Continue with actions and measures from Stages 2, 3 and 4.<br>• Increase public outreach.<br>• Develop water budgets for all accounts and notice those accounts appropriately.<br>• Perform an audit of distribution system to reduce system water loss. | • Continue with actions and measures from Stages 1 through 4 except where superseded by more stringent requirements.<br>• Turf irrigation is prohibited at all times.<br>• Existing irrigation systems shall not be expanded.<br>• Water budgets established for all customer accounts.<br>• No new potable water service shall be provided, no new temporary meters or permanent meters shall be provided, and no statements of immediate ability to serve or provide potable water service (such as, will-serve letters, certificates or letters of availability) shall be issued by the City, except under the following circumstances:<br>1. A valid, unexpired building permit has been issued for the project; or<br>2. The project is necessary to protect the public's health, safety, and welfare; or<br>3. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the Public Works Director; or<br>4. To provide continuation of water service or to restore service that has been interrupted for a period of one year or less.<br>• Other measures as may be approved by Resolution of the City Council. |

Notes
a) Conditions outside of the control of the City of Burlingame may have a significant impact on water demand, such as increased public awareness as a result of press coverage during a significant drought, economic factors, and atypical weather patterns. As a result, the drought management measures presented herein are intended as guidelines. The specific measures implemented may be adjusted as appropriate based on the levels of demand experienced during a water shortage.

## 7.7 PENALTIES, CHARGES AND OTHER ENFORCEMENT

*110632. (a) (6) Penalties or charges for excessive use, where applicable.*

Enforcement of Burlingame's water use restrictions and prohibitions focuses on soliciting cooperation from water customers who are unaware of the restrictions or have failed to comply with the provisions of Chapter 15.06 of the City of Burlingame Municipal Code and this WSCP. If discussions with the customer are unsuccessful in obtaining compliance, Burlingame is authorized to issue penalties to customers that violate the restrictions and prohibitions.

To ensure that customers comply with the provisions of the WRPR, the Burlingame specifies certain actions, prohibition of actions, and penalties that may be instituted during times of drought. As described in the DMM section of this document (Section 8), these actions include the following:

*Prohibited Actions*

- Additional water allocation for new landscaping;
- Gutter or street flooding;
- Using a hose to clean hard surfaces (e.g. sidewalk);
- Use of potable water in decorative fountains;
- Use of potable water for non-essential construction purposes (e.g. backfill consolidation, dust control);

*Mandatory Actions*

- Positive shutoff valves for all hoses;
- Low water use landscaping designs and irrigations systems for new or renovated landscaping;
- Restaurant/Hotels shall serve water upon request only;
- Water used for cooling purposes must be recycled;
- Broken / defective plumbing must be repaired immediately;
- Water-saving fixtures or devices must be incorporated into new construction projects if they are to obtain a service connection;

*Encouraged Actions*

- Use of groundwater or reclaimed water for irrigation of turf areas, median strips, and street sweepers; and
- Use of reduction flow equipment for vehicle dealer/fleet washing.

In addition to the above prohibitions, mandates, and encouraged actions, the WRPR states that water accounts found to be "excessive users" are "subject to review and possible reduction, including termination of service." Under certain circumstances (e.g., repeated violations of water use restrictions) the City may install a flow restriction devise or terminate service at the offending account.

## 7.8 CONSUMPTION REDUCTION METHODS

*10632. (5) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.*

As discussed above, the WSCP lists the consumption reduction methods that Burlingame will implement during each stage of action to reduce the City's own water consumption and encourage reduction in water use by its customers. Consumption reduction methods associated with each stage of action are presented in Table 7-5. The monthly and cumulative annual water savings impacts associated with each restriction, prohibition and consumption reduction method were quantitatively estimated using the DRT for each stage of action, see Appendix K.

A main focus of Burlingame's planned consumption reduction measures is to increase public outreach and keep customers informed of the water shortage emergency and actions they can take to reduce consumption. The public outreach efforts that Burlingame will implement to respond to a water shortage are described in Section 7.14.2.

Consumption reduction methods also include measures to reduce system losses through a reduction in line flushing and fire training exercises, increase enforcement and patrols, develop water budgets, and in certain conditions, implement a moratorium on new services.

## 7.9 DETERMINING WATER SHORTAGE REDUCTIONS

*10632. (a) (9) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.*

Burlingame monitors water use through analysis of wholesale water purchases and customer meter readings. Burlingame reads meters installed on each of its supply turnouts to monitor wholesale water purchases. In addition, each customer account is metered. Some non-residential and multi-family customers also have separate irrigation meters to monitor water use for landscape irrigation separately from indoor uses.

## 7.10 REVENUE AND EXPENDITURE IMPACTS

*10632 (a) (7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.*

In the event of a drought, if the City anticipates significant loss in revenue due to decreased consumption, the City may increase its water rates so that customers are charged for the actual cost of providing water during a shortage. These rates will be specified in the City of

Burlingame's water rate schedule, as approved by the City Council and in accordance with Proposition 218 requirements. Additionally, the City of Burlingame carries a rate stabilization line item in its annual budget. These funds are used by the City to overcome revenue impacts due to fluctuating water use such as occur during a water shortage.

### 7.11 WATER SHORTAGE CONTINGENCY ORDINANCE AND RESOLUTION

*10632 (a) (8) A draft water shortage contingency resolution or ordinance.*

As discussed above, Burlingame has authority within Chapter 15.06 of the City of Burlingame Municipal Code to require water rationing and conservation and to enforce penalties. Municipal Code Chapter 15.06 and an adopted water shortage contingency resolution are included as Appendix L of this UWMP.

### 7.12 CATASTROPHIC SUPPLY INTERRUPTION PLAN

*10632 (a) (3) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.*

Catastrophic supply interruptions may be caused by a regional power outage, an earthquake, or other disaster. The City benefits from two levels of emergency planning: planning by SFPUC and its own emergency planning work. In the event of a catastrophic supply interruption, the response procedures that the City would follow are described in:

- SFPUC Emergency Operations Plan (EOP);
- San Mateo County's Operational Area EOP Potable Water Procurement and Distribution Annex;
- Burlingame's EOP;
- Burlingame's Potable Water Emergency Plan (PWEP); and
- Burlingame's Water System Emergency Response Plan (ERP).

Actions described in the SFPUC EOP focus on maintaining flow within, and from, the Regional Water System (RWS) pipelines. Burlingame's EOP was written in coordination with the County of San Mateo's Operational Area EOP Potable Water Procurement and Distribution Annex (County of San Mateo, 2004).

Together, these EOPs provide the framework for responding to major emergencies or disasters associated with natural disasters, technological incidents, and national security/terrorism emergencies or disasters associated with natural disasters, technological incidents, and national security/terrorism emergencies. Sections of these EOPs outline specific strategies to prepare for, mitigate, respond to, and recover from an emergency or disaster that affects the water utilities that serve the population within San Mateo County and Burlingame, in particular.

In the event that this water is unsafe for consumption, Burlingame plans to distribute potable water to residents at emergency distribution centers. The following sections summarize the information presented in the aforementioned Plans, including measures to be taken to ensure the reliability of the water supply, and describe the methods by which Burlingame would distribute drinking water to its residents in the event of a water system emergency.

### 7.12.1 Potable Water Emergency Operations Plan

Burlingame's Potable Water Emergency Plan (PWEP), an annex to the City's EOP, guides the City's emergency management in an organized response to water treatment and distribution emergencies that affect the City. The City conducts training periodically to help assure that City personnel are up to date regarding of the emergency response procedures. Detailed information on personnel roles, responsibilities, emergency services, communication, recovery, and reporting procedures are provided in the PWEP.

In the event of an emergency, Burlingame will implement its PWEP, the first step of which involves conducting an immediate Damage Assessment of the System to identify and report any problems associated with pumps, storage facilities, and water infrastructure. Critical pump stations have onsite emergency power generators to provide uninterrupted power and the City can supply a portable generator to provide power those pump stations that are not permanently equipped with emergency generators. The City can also pump water to different parts of the system through alternate routes if a pump station is inoperable or can backfeed the system from Mills Reservoir.

If the water supplied through the regional water system is not potable or cannot otherwise be treated for potable use, Burlingame will distribute emergency drinking water supplies, from designated Emergency Shelters (such as City facilities and school campuses). The location of these shelters will be determined based on the emergency at-hand. It is estimated that, given the normal operating capacity of its storage reservoirs, Burlingame has approximately 1.6 million gallons of water in storage. In an emergency situation, this quantity would be sufficient to provide the City's residents with five gallons per person per day for 11 days, two gallons per person per day for 27 days, or one gallon per person per day for 54 days.

### 7.12.2 Burlingame's Emergency Response Plan

The City's Water System ERP includes plans and procedures that can be implemented in the event of a terrorist or other intentional attack on the public water system to lessen the impact of on the safety and supply of drinking water. It is the City's intent that the ERP be used in conjunction with the SMOA EOP Center Guidebook and Section Checklists and the City's EOP.

Much of the information contained in the City's ERP was compiled from the USEPA's *Response Protocol Toolbox: Planning for and Responding to Drinking Water Contamination Threats and Incidents,* the final module of which is dated April, 2004. The purpose of USEPA's Guidance Document is to assist water systems in complying with the Public Health Security and Bioterrorism and Response Act, dated 12 June 2002 (42 USC 201 et seq.).

The City's ERP details threat evaluations, site characterizations, planned public health and operational responses, public notification strategies, short-term alternate domestic water

supplies, and remediation and recovery actions. The City's ERP considers five different potential incidents identified from available USEPA guidance:

- Contamination of the water system;
- Contamination at a major event;
- Notification from health officials of potential water contamination;
- Intrusion through Supervisory Control and Data Acquisition (SCADA) system; and
- Structural damage.

Evaluation of these threats is to be carried out according to the management structure outlined in the City's ERP. Agencies included in this discussion are consistent with the five designated levels of the Standardized Emergency Management System (SEMS) defined in the California Code of Regulations, Title 19 (Division 2, Chapter 1). The SEMS is intended to standardize responses to emergencies that involve multiple jurisdictions or multiple agencies. The organizational levels referred to in these regulations are: (1) field response (e.g., local fire and police departments), (2) local government (i.e., the City of Burlingame), (3) operational area (i.e., San Mateo County), (4) regional, and (5) State (led by the Governor's Office of Emergency Services).

## 7.13 ESTIMATE OF MINIMUM SUPPLY FOR NEXT THREE YEARS

*10632 (a) (2) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.*

The minimum water supply available during the next three years during multiple dry years is presented in Table 7-6. The dry-year supply estimates are based on the delivery estimates provided by BAWSCA and SFPUC as part of the 2015 UWMP update process (SFPUC, 2016; BAWSCA, 2016; Appendix G) and per hypothetical application of the Tier 1 and Tier 2 allocation processes described in Section 6. The available water supplies estimated for 2017 and 2018 are less than the multiple dry year supplies scenarios discussed in Section 6, which apply to years 2020 and later. Prior to 2020, the anticipated completion date of the Water System Improvement Program, the SFPUC has projected lower drought year allocations (Appendix G).

## 7.14 WATER SHORTAGE CONTINGENCY PLAN IMPLEMENTATION

This section describes how the WSCP will be implemented.

### 7.14.1 Water Shortage Declaration and Termination Procedures

The provisions of each water shortage stage of action are triggered upon the Burlingame City Council's determination that a Governing Authority has required Burlingame to achieve a voluntary or mandatory reduction in water use because of water shortage conditions.

The stage of action will become effective after the City Council declares a particular stage of action and Burlingame has published notice of this determination. Once effective, the

**Table 7-6**
**Estimated Minimum Three-Year Supply (DWR Table 8-4)**
City of Burlingame, California

| | Average Normal Year Supply (MG) | Multiple-Dry Year Water Supply (MG) | | |
|---|---|---|---|---|
| | | 2016 | 2017 | 2018 |
| Available Water Supply | 1,909 | 1,628 | 1,376 | 1,376 |

Abbreviations:
DWR = Department of Water Resources
MG = million gallons
SFPUC = San Francisco Public Utilities Commission
WSIP = Water Supply Improvement Program

Notes:
(a) The available water supplies during 2017 through 2018 are less than the multiple dry year supply scenarios discussed in Section 6, which apply to years 2020 and later. Prior to completion of the WSIP, which is currently assumed to be complete by 2020, the SFPUC is projecting lower supply allocations during multiple dry years. See Appendix G.

provisions of a water shortage stage of action will stay in effect until: (1) a different stage of action is declared; or (2) the City Council determines that the water shortfall condition no longer exists and Burlingame has published notice of this determination.

After the termination of the water shortage conditions, Burlingame will oversee any remaining termination and WSCP review activities. These activities could include:

- Publicize gratitude for the community's cooperation.
- Restore water utility operations, organization, and services to pre‑event levels.
- Document the event and response and compile applicable records for future reference.
- Collect cost accounting information, assess revenue losses and financial impact, and review deferred projects or programs.
- Debrief staff to review effectiveness of actions, to identify the lessons learned, and to enhance response and recovery efforts in the future.
- Update the WSCP, as needed.

### 7.14.2 Public Outreach

Even before formal declaration of a water shortage, a public information program will be activated to provide customers with as much advance notice as possible. Following declaration of a shortage, Burlingame customers would need to be provided notice of water shortage rules and regulations via a variety of media and communications methods.

Coordination between Burlingame and with other public agencies can begin prior to formal declaration of a water shortage and can be accomplished through regular meetings, e‑mail group updates, and presentations. In a regional water shortage scenario, Burlingame would use the public outreach resources and materials provided by BAWSCA and/or the SFPUC. In addition to these materials, Burlingame may develop its own materials to communicate with customers, such as a dedicated customer service hotline, and expand its normal public outreach to support its water conservation efforts (see Section 8).

### 7.14.3 Staff Resources

As discussed in Section 8.2.6, the City currently has several staff members equating to a approximately 1 full-time equivalent (FTE) staff person dedicating time to water conservation efforts. Staff time dedicated to water conservation and enforcement action will increase with the severity of a supply shortage. Additional duties may be assigned to current City employees or hiring of temporary staff may be considered to meet staffing needs during extreme water shortages.

# 8. DEMAND MANAGEMENT MEASURES

*10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:*
*10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*
*(1) (A) For an urban retail water supplier, as defined in Section 10608.12, a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years. The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*
*(1) (B) The narrative pursuant to this paragraph shall include descriptions of the following water demand management measures:*

- *(i) Water waste prevention ordinances.*
- *(ii) Metering.*
- *(iii) Conservation pricing.*
- *(iv) Public education and outreach.*
- *(v) Programs to assess and manage distribution system real loss.*
- *(vi) Water conservation program coordination and staffing support.*
- *(vii) Other demand management measures that have a significant impact on water use as measured in gallons per capita per day, including innovative measures, if implemented.*

This section provides an overview of the City of Burlingame's (City's or Burlingame's) current and planned demand management measures (DMMs), which include specific types and groupings of water conservation measures typically implemented by water suppliers; the DMMs are closely aligned with the California Urban Water Conservation Council (CUWCC) Best Management Practices. Burlingame administers several of its DMMs through participation in Bay Area Water Supply and Conservation Agency's (BAWSCA's) Regional Water Conservation Program. The following sections describe BAWSCA's Regional Water Conservation Program and the nature and extent of the specific DMMs implemented by Burlingame.

## 8.1 REGIONAL WATER CONSERVATION

Burlingame participates in BAWSCA's Regional Water Conservation Program, as a part of its overall water conservation program. The BAWSCA Regional Water Conservation Program is a two-tier program, consisting of "Core Programs" and "Subscription Programs," and is open to all member agencies. The BAWSCA Regional Water Conservation Program is implemented consistent with the intent of its Water Conservation Implementation Plan (WCIP), which was developed with input from the member agencies and serves as a coordinated, regional plan for implementing water conservation throughout the BAWSCA service area. Although the program was designed and available at a regional level, most of the implementation of the individual programs within the Burlingame service area is done by City staff.

The Core Programs provided as a part of the Regional Water Conservation Program include conservation measures that benefit from regional implementation and provide overall regional benefit, and are funded through the annual BAWSCA budget. Measures provided across the

BAWSCA service area as part of the Core Program include regional messaging, public outreach, landscape water efficiency education classes and tools, native garden tours and symposiums, support for adoption of local indoor and outdoor water efficiency ordinances, and access to BAWSCA's water conservation database.

The Subscription Programs are conservation measures that individual agencies must elect to participate in, and whose benefits are primarily realized within individual water agency service areas. As such, the Subscription Programs are funded by individual member agencies, based on their participation level. Burlingame actively participates in several available Subscription Programs, including:

- High-Efficiency Toilet (HET) Rebates
- High-Efficiency Residential Washing Machine Rebates
- Water-Wise School Education Kits and Curriculum
- EarthCapades Assemblies School Education Program

Burlingame's implementation of, and participation in, the Core and Subscription Programs are described in detail below, as they relate to Burlingame's implementation of the DMMs.

## 8.2 AGENCY WATER CONSERVATION

Burlingame implements all of the DMMs, as described below.

### 8.2.1 DMM 1 – Water Waste Prevention Ordinances

The City's Water Rationing Plan (Resolution 49-92, Appendix I) includes a subsection that reduces water waste during times of shortage by prohibiting, mandating, and encouraging various actions.

Prohibited Actions include:

- Additional water allocation for new landscaping;
- Gutter or street flooding;
- Using a hose to clean hard surfaces (e.g. sidewalk);
- Use of potable water in decorative fountains; and
- Use of potable water for non-essential construction purposes (e.g. backfill consolidation, dust control).

Mandatory actions include:

- Positive shutoff valves for all hoses;
- Low water use landscaping designs and irrigations systems for new or renovated landscaping;
- Restaurant/Hotels shall serve water upon request only;
- Water used for cooling purposes must be recycled;

- Broken / defective plumbing must be repaired immediately; and
- Water-saving fixtures or devices must be incorporated into new construction projects if they are to obtain a service connection.

Encouraged actions include:

- Use of groundwater or reclaimed water for irrigation of turf areas, median strips, and street sweepers and
- Use of reduction flow equipment for vehicle dealer/fleet washing.

In addition, on 9 May 2016, Governor Brown issued Executive Order B-37-16 that directed the SWRCB to make permanent the mandatory restrictions that were imposed previously as part of the 2014 and 2015 emergency drought regulations. These prohibitions to prevent water waste are included as Stage 1 of Burlingame's Water Shortage Contingency Plan (WSCP), and remain in place at all times, irrespective of water supply conditions. These mandatory, year-around water waste prohibitions and actions are show in in Table 7-5.

### 8.2.2 DMM 2 – Metering

*526. (a) Notwithstanding any other provisions of law, an urban water supplier that, on or after January 1, 2004, receives water from the federal Central Valley Project under a water service contract or subcontract... shall do both of the following: (1) On or before January 1, 2013, install water meters on all service connections to residential and nonagricultural commercial buildings... located within its service area.*
*527. (a) An urban water supplier that is not subject to Section 526 shall do both the following: (1) Install water meters on all municipal and industrial service connections located within its service area on or before January 1, 2025.*

All Burlingame customers are metered and billed by meter size and the quantity of use. Customers with large landscaped areas (i.e., greater than 5,000 square feet) are required to install separate irrigation meters in accordance with the "Establishing Water Conservation In Landscaping Regulations" Ordinance modeled after the California Water Conservation in Landscaping Act (Ordinance 1845-2010), enacted in March 2010. Meters are recommended for landscape areas greater than 2,500 square feet. The installation of such meters is enforced through the City's Community Development Department, Building Division.

Water meters are read by City employees either manually, using "touch-read" meters, or via automatic meter reading (AMR) instrumentation. Meters are rechecked frequently when a customer's bill is suspiciously higher than previous months. If a meter recheck confirms a large increase in water use, the City proceeds with a leak investigation or residential survey.

As of 2016, all of the City's approximately 9,000 meters have been upgraded to automatic meter reading (AMR) meters that radio capabilities. The implementation of AMR meters allows Burlingame to automate meter reading and provide real-time water use data to staff that can be used to aggressively target leaks and atypically high water use during normal years and periods of water shortage. Meters are rechecked frequently when a customer's bill is suspiciously higher than previous months. If a meter recheck confirms a large increase in water use, the City

proceeds with a leak investigation or residential survey. For billing purposes, customer meters are read on a bimonthly basis.

### 8.2.3 DMM 3 – Conservation Pricing

During non-drought years, the City's water residential customers are billed for every 1,000 gallons of water used, in accordance with the five tier rate schedule shown below, on a bi-monthly basis.

| Tier | Volume | Rate per 1,000 Gallons |
|---|---|---|
| Tier 1 | 0 to 2,000 gallons | (included in fixed fee) |
| Tier 2 | 2,000 to 9,000 gallons | $8.44 |
| Tier 3 | 9,001 to 18,000 gallons | $8.91 |
| Tier 4 | 18,000 gallons to 30,000 gallons | $10.28 |
| Tier 5 | 30,001 gallons and above | $12.10 |

Residential customers located in Burlingame Hills (i.e., the unincorporated San Mateo County portion of the service area) are charged $10.31 per 1,000 gallons, and all other classifications are charged $9.09/1,000 gallons. All customers are also charged an additional fixed monthly charge according to their meter size. This increasing block rate structure was enacted as of 1 January 2013, and the specific rates above were effective 1 January 2015.[24]

### 8.2.4 DMM 4 – Public Education and Outreach

Burlingame implements a number of public education and outreach initiatives with support from the BAWSCA Regional Water Conservation Program. Specific initiatives include:

- School education program – EarthCapades Assemblies: Burlingame facilitates school assemblies performed by EarthCapades at schools within its service area. The EarthCapades performances combine age-appropriate state science standards with circus skills, juggling, music, storytelling, comedy, and audience participation to teach environmental awareness, water science, and conservation. The EarthCapades assemblies are designed to include local water source and watershed education and specific information pertaining to the Burlingame service area. Burlingame and BAWSCA provide specific information to EarthCapades regarding the San Francisco Public Utilities Commission Regional Water System (SFPUC RWS) and other topics (e.g., recycled water). EarthCapades integrates this information into the specific scripts used for assemblies conducted within the Burlingame service area. Burlingame facilitated and paid for EarthCapades assemblies in 2015.

- Tuolumne River Trust Classroom Program: The Tuolumne River Trust (TRT) school outreach program is called "That's the Tuolumne in My Tap" and includes a slideshow presentation to fourth and fifth graders about the Tuolumne River resource and water conservation. The TRT's outreach is designed to educate local students about where

[24] City of Burlingame Water Rates, https://www.burlingame.org/modules/showdocument.aspx?documentid=12275, accessed 20 April 2016.

their water comes from and to promote an ethic of environmental stewardship. The presentation focuses on the history and special qualities of the Tuolumne River, the animals that depend on the River, and what can be done to help protect the river by conserving water. BAWSCA supplies the TRT with information and materials that described the local water conservation options that the TRT distributes to students. Such materials include information about the high-efficiency toilet and washing machine rebates, schedules for the Water-Efficient Landscape Education Classes, information about the online *Water-Wise Gardening in the Bay Area* tool, and prizes (e.g., bracelets that encourage water conservation) for students that answered questions during the TRT presentation. Burlingame facilitated and paid for TRT presentations in 2015.

- Water-Wise School Education Kits and Curriculum: The Water-Wise school education program is provided by Resource Action Programs (a contractor to BAWSCA) to fifth grade students within the Burlingame service area. Resource Action Programs works directly with teachers and schools to provide them with turn-key, in-classroom water conservation curriculum and indoor and outdoor water conservation kits (i.e., the Water-Wise Kits). The Water-Wise curriculum has been designed to be easily implemented by teachers, and easily understood and taken back into the home by the students. The Water-Wise Kits include water saving devices that can be installed at the student's homes (e.g., low-flow showerheads and faucet aerators) and a water audit that the students can perform with their parents.

  The students are provided with the motivation, information, and tools they need to perform an in-home water audit. The information and material provided to the teachers and students also includes methods that can be used to quantify the water savings as a result of installing the equipment contained in the kit and performing the recommended, water-conserving actions. After the student performs the audit and installs the water and energy saving devices, affidavits signed by the parents are returned to the school, collected by the teacher, and forwarded to Resource Action Programs for documentation of measure implementation and the estimated water savings. Resource Action Programs then prepares a final report for distribution to the City. Burlingame has participated in the Water-Wise School Education Program every year between 2010 and 2015.

- Water efficient landscape education classes: Burlingame hosts and advertises a series of Water-Efficient Landscape Education Classes developed by BAWSCA that are free to the public and are designed to introduce homeowners and landscape professionals to the concepts of sustainable landscape design. The classes focus on creating beautiful, water-efficient gardens as an alternative to lawns. Examples of specific class topics include "Lawn Replacement 101", "Drought Tolerant Plants", and "From Graywater to Green Garden", among others. Burlingame offered landscape education classes to the public regularly between 2010 and 2015.

- *Water-Wise Gardening in the Bay Area* landscape educational tool: Burlingame makes copies of the popular landscape educational tool - *Water-Wise Gardening in the Bay Area* on CD available to customers at its City Hall. The *Water-Wise Gardening in the*

*Bay Area* tool contains information on how to create and maintain a beautiful, low-water-use garden and includes photographs of water-efficient gardens and provides links to the plants that compose the featured gardens. The featured gardens are primarily composed of sites in the Bay Area, specifically within the BAWSCA service area.

- Hosting information booths at fairs and public events: City staff set up information booths at large public events in the Burlingame service area (e.g., at "Art in the Park") to distribute information regarding Burlingame's water conservation programs including rebate programs, landscape analysis programs, and fixture give-aways. Burlingame participated in various public events between 2010 and 2015.

- Informative website, online tools, or social media: Burlingame maintains pages on its website (https://www.burlingame.org/) that are dedicated to its water conservation programs. The website provides information regarding its rebate programs, water use regulations, and water conservation tips and links to interactive tools.

- Media campaigns and other outreach: Burlingame also encourages water conservation and markets its rebate programs through the distribution of water bill inserts informing customers about water conservation and rebate programs. The City also provides literature, information, and classroom visits upon request. Visits include an informational presentation on the City's water and wastewater system, conducted by Eva Justimbaste from Veolia Water North America, the company that operates and maintains the WWTP.

### 8.2.5 DMM 5 – Programs to Assess and Manage Distribution System Real Loss

As discussed in Section 3.1.3, distribution system water loss was estimated to average 6% of total water demand between 2010 and 2015. Water supply to Burlingame is recorded by SFPUC master meters. Water distributed to customers is also metered, with the exception of water used from fire hydrants for emergency or most maintenance purposes. These activities account for a portion of the "unaccounted for water" (UAW).

The City conducts annual system water audits to determine the quantity of water lost (UAW) by comparing the City's purchased potable water supplies with its recorded potable water use. Water purchases are recorded in the City's Fiscal Reports, while total metered and unmetered use is recorded by the City register.[25] The City will continue to monitor its potable water distribution system efficiency, with a goal to maintain it above 90% efficient.

### 8.2.6 DMM 6 – Water Conservation Program Coordination and Staffing Support

A number of water services and operations staff perform the duties of "Water Conservation Coordinator" for the City. These staff respond to leak investigations, perform residential surveys, maintain water conservation material and kits, provide customer service to low pressure and dirty water reports, and complete the other water conservation activities on behalf

[25] Unmetered water use is estimated by the Fire and Water Departments.

of the City. Regional planning and coordination efforts are handled by BAWSCA with input from agency representative.

Contact information for Burlingame's conservation program is listed below:

Phone: 650- 558-7612
Email: WaterConservation@burlingame.org

### 8.2.7 DMM 7 – Other DMMs

Other DMMs provided by the Burlingame, in addition to those discussed above, include the following:

- HET Rebates: Burlingame locally administers an HET Rebate Program for its residential and commercial customers. Tthe program is one of the Subscription Programs available to BAWSCA member agencies. As part of this program, Burlingame offers customers the following rebates for customers replacing a high-volume toilet (i.e., 3.5 gallons per flush (gpf), or more):
    - Up to a $175 Rebate for replacing an existing toilet with a qualifying MaP® Premium model toilet (1.06 gallons or less per flush); or
    - Up to a $100 Rebate per standard HET (i.e., between 1.06 gallons and 1.28 gallons per flush).

  Up to three rebates are allowed per address. Between 2010 and 2015, Burlingame provided a total of 1,867 rebates.[26]

- High-Efficiency Residential Washing Machine Rebates: Burlingame locally administers a High-Efficiency Residential Washing Machine Rebate program for its residential customers which, through joint participation with Pacific Gas & Electric (PG&E), includes a rebate of up to $150 to customers that purchase a qualifying washing machine.[27] The High-Efficiency Residential Washing Machine Rebate program is one of the Subscription Programs available to BAWSCA member agencies. Burlingame offered washing machine rebates to its customers between 2010 and 2015.

- Residential Surveys: Burlingame's residential surveys are performed on request or when triggered by customer calls regarding high bills or leak investigations. The surveys consist of a personal visit to the residence by the Water Conservation Coordinator, aimed at determining the source of increased water use (e.g. leaks, swimming pools, etc.). This site visit includes checks for leaks in toilets and faucets, showerhead flow rates and replacement recommendations, as well as checks on irrigation and landscape systems. The City offered audits to its residential customers from 2010 through 2015.

[26] Number of rebates issued was provided by Matt Costello.
[27] PG&E currently contributes $50 of the total $150 rebate. Total rebate value has varied from year to year.

- Water-saving fixtures give-away: Burlingame offers its residential customers free water-saving fixtures. The City encourages its customers to pick up and install the following free water saving fixtures from City Hall:
    - Bathroom aerator - uses 1 gallons per minute (gpm)
    - Kitchen aerator - uses 1.5 gpm
    - Low-flow shower head - uses 1.5 gpm
    - Toilet leak detection tablets (2 tablets per packet)
    - Water conserving hose nozzles (with shut-off valve)
    - *Water-Wise Gardening in the Bay Area* CD-ROM.

  Burlingame offered fixture kits to its customers regularly over the last five years.

- Residential retrofits: The City adopted Ordinance 1846-2010 establishing indoor water conservation regulations in March 2010, as required under CALGreen Building Code Standards.[28] The ordinance requires all new construction and applicable remodels to at a minimum, install fixtures that comply with the efficiency standards listed in the ordinance. The ordinance complies with the provisions of the 2007 California Plumbing Code. Compliance with the Ordinance is overseen by the City Community Development Department, Building Division.

- CII Audits: When possible, the City provides commercial and industrial customers with assistance in conducting water audits and in determining ways to cost-effectively reduce water consumption. The purpose of the audits is to identify inefficient, wasteful, or malfunctioning fixtures. It includes inspection of plumbing fixtures, cooling equipment and irrigation methods. Where applicable, the City identifies opportunities for in-house recycling of process-water, low-flow fixtures and toilets, and landscaping water conservation. Burlingame offered such audits throughout the last five years.

- Leak identification program: To minimize water loss within the system, the City conducts leak investigation and repair on a regular basis. Investigations are triggered by abnormally high water bills.[29] When leaks in the system are detected, they are repaired by the City. Leaks on the customer's side of the meter are reported to the customer and the City advises them on repair. Burlingame's leak detection program was implemented regularly over the last five years.

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[28] The City requires that all new residential and non-residential construction comply with the mandatory CALGreen Requirements (Chapter 18.30 of the Burlingame Municipal Code, Ordinance 1857-2010, adopted in 2010).

[29] The City defines a water bill as abnormally high if it exceeds water use from the same billing cycle of the previous year by more than 20%. Additionally, the City will respond to customer complaints of high water bills.

## 8.3 IMPLEMENTATION OVER THE PAST FIVE YEARS

*10631. (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following: (1)(A) … a narrative description that addresses the nature and extent of each water demand management measure implemented over the past five years.*

Table 8-1 and the associated chart summarizes the DMMs implemented by Burlingame and the extent of implementation (e.g., number of rebates) for each of the programs listed under Section 8.2 between 2010 and 2015.

## 8.4 PLANNED IMPLEMENTATION TO ACHIEVE WATER USE TARGETS

*10631.(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:*
*(1)(A) …The narrative shall describe the water demand management measures that the supplier plans to implement to achieve its water use targets pursuant to Section 10608.20.*

To achieve the SBx7-7 water use targets described in Section 4, Burlingame intends to continue and expand implementation of the DMMs discussed above and will continue to participate in BAWSCA's Regional Water Conservation Program. In the future, specific program offerings may change as the market evolves. Burlingame's 2016 Demand Management Decision Support System Model (DSS Model), as described in Section 3.2, estimates projected water demands and quantifies passive and active conservation water savings potential. As discussed in Section 4.5, the DSS Model projections demonstrate that Burlingame is expected to achieve its water use targets through, among other things, continued implementation of these DMMs.

**Table 8-1**
**Summary of DMMs and Implementation over the Past Five Years (2010-2015)**
City of Burlingame, California

| DMM Category | Program or Activity | Target Sector | Nature of Implementation | Extent of Implementation |
|---|---|---|---|---|
| 1 | Water Waste Prevention Ordinances | SF, MF, CII And IRR | Burlingame's Water Rationing Plan Resolution was enacted in 1992 and adopted specific rules that required water-saving actions and prohibited water-wasting activities. | The water waste prohibitions are in place at all times. |
| 2 | Metering | SF, MF, CII And IRR | All water service connections are metered, with the exception of fire services. Many non-residential and multi-family customers have sub-meters to monitor water use for landscape irrigation separately from indoor uses. All Burlingame meters have been upgraded to an Automatic Meter Reading (AMR) system as of 2016. | All accounts are metered and read on a bimonthly basis. |
| 3 | Conservation Pricing | SF, MF, CII And IRR | The current water rate structure includes a tiered water consumption charge based on water usage by residential customers, in addition to fixed fees based on meter size: https://www.burlingame.org/modules/showdocument.aspx?documentid=12275, accessed 20 April 2016. | Tiered rate structure in place during 2010-2015. |
| 4 | School Education Program: EarthCapades Assemblies | SF, MF | School assemblies that teach water science and conservation to students, including local water source and watershed education and specific information pertaining to the Burlingame service area. Burlingame participates through the BAWSCA Regional Water Conservation Program. | Burlingame facilitated and paid for EarthCapades assemblies in 2015. |
| 4 | Tuolumne River Trust Classroom Program | SF, MF | Fourth and fifth grade students are shown a slideshow presentation about the Tuolumne River resource and water conservation, which focuses on the history and special qualities of the Tuolumne River, the animals that depend on the River, and what can be done to help protect the river by conserving water. | Burlingame facilitated and paid for Tuolumne River Trust presentations in 2015. |
| 4 | Water-Wise School Education Kits and Curriculum | SF, MF | Fifth grade teachers are provided with a water conservation curriculum. Kits are distributed to 5th grade students that enable them to install water saving devices and perform a water audit in their home. Burlingame participates through the BAWSCA Regional Water Conservation Program. | Burlingame has participated in the Water-Wise School Education Program every year between 2010 and 2015. |
| 4 | Water Efficient Landscape Education Classes | SF, MF | Free classes developed by BAWSCA and hosted by Burlingame provide information regarding water efficient landscaping and Burlingame's water conservation programs. The classes focus on creating beautiful, water-efficient gardens as an alternative to lawns, and include "Lawn Replacement 101," "Drought Tolerant Plants," and "From Graywater to Green Garden," among others. Burlingame participates through the BAWSCA Regional Water Conservation Program. | Burlingame offered landscape education classes to the public regularly between 2010 and 2015. |
| 4 | Water-Wise Gardening in the Bay Area landscape educational tool | SF | Burlingame promotes the landscape educational tool - Water-Wise Gardening in the Bay Area. The Water-Wise Gardening in the Bay Area tool contains information on how to create and maintain a beautiful, low-water-use garden and includes photographs of water-efficient gardens and provides links to the plants that compose the featured gardens. | Burlingame offers a CD containing the tool to its customers upon request. |

## Table 8-1 (Continued)
## Summary of DMMs and Implementation over the Past Five Years (2010-2015)
City of Burlingame, California

| DMM Category | Program or Activity | Target Sector | Nature of Implementation | Extent of Implementation |
|---|---|---|---|---|
| 4 | Information Booths at Public Events | SF, MF, CII And IRR | At public events, Burlingame distributes information and materials to participants regarding its water conservation programs. | Burlingame participated in various public events between 2010 and 2015. |
| 4 | Other Public Outreach | SF, MF, CII And IRR | Burlingame maintains pages on its website (https://www.burlingame.org) that are dedicated to its water conservation programs. The website provides information regarding its rebate programs, water use regulations, and water conservation tips and links to interactive tools. Burlingame also encourages water conservation and markets its rebate programs through the distribution of water bill inserts informing customers about water conservation and rebate programs. The City also provides literature, information, and classroom visits upon request. Visits include an informational presentation on the City's water and wastewater system, conducted by Eva Justimbaste from Veolia Water North America, the company that operates and maintains the WWTP. | Ongoing implementation from 2010 through 2015. |
| 5 | Programs to Assess and Manage Distribution System Real Loss | Non-revenue | The City conducts annual system water audits to determine the quantity of water lost by comparing the City's purchased potable water supplies with its recorded potable water use. Water purchases are recorded in the City's Fiscal Reports, while total metered and unmetered use is recorded by the City register. The City will continue to monitor its potable water distribution system efficiency, with a goal to maintain it above 90% efficient. | Ongoing implementation from 2010 through 2015. |
| 6 | Conservation Program Coordination and Staff | SF, MF, CII And IRR | A number of water services and operations staff perform the duties of "Water Conservation Coordinator" for the City. These staff respond to leak investigations, perform residential surveys, maintain water conservation material and kits, provide customer service to low pressure and dirty water reports, and complete the other water conservation activities on behalf of the City. Regional planning and coordination efforts are handled by BAWSCA with input from agency representative. | The water conservation program is coordinated and administered by Burlingame staff. |
| 7 | High Efficiency Toilet Rebate | SF, MF, CII | Up to $175 rebate for qualifying toilets less than 1.06 gpf; up to $100 rebate per HET (between 1.06 and 1.28 gpf). Up to three rebates are allowed per address. Burlingame participates through the BAWSCA Regional Water Conservation Program | Between 2010 and 2015, Burlingame provided a total of 1,867 rebates |
| 7 | High-Efficiency Residential Washing Machine Rebate Program | SF, MF | Through a partnership with PG&E, up to a $150 rebate is offered to residential customers, for qualifying high-efficiency washing machines. Burlingame participates through the BAWSCA Regional Water Conservation Program. | Burlingame offered washing machine rebates to its customers between 2010 and 2015. |
| 7 | Residential Surveys | SF, MF | Residential surveys are performed on request or when triggered by customer calls regarding high bills or leak investigations. The surveys consist of a personal visit to the residence by the Water Conservation Coordinator, aimed at determining the source of increased water use (e.g. leaks, swimming pools, etc.). | Ongoing implementation from 2010 through 2015. |

**Table 8-1 (Continued)**
**Summary of DMMs and Implementation over the Past Five Years (2010-2015)**
City of Burlingame, California

| DMM Category | Program or Activity | Target Sector | Nature of Implementation | Extent of Implementation |
|---|---|---|---|---|
| 7 | Water-saving fixtures give-away | SF, MF | Burlingame offers its residential customers free water-saving fixtures. The City encourages its customers to pick up and install free water saving fixture kits from City Hall. | Burlingame offered fixture kits to its customers regularly from 2010 through 2015. |
| 7 | Residential retrofits | SF, MF, CII | The City adopted Ordinance 1846-2010 establishing indoor water conservation regulations in March 2010, as required under CALGreen Building Code Standards. The ordinance requires all new construction and applicable remodels to at a minimum, install fixtures that comply with the efficiency standards listed in the ordinance. | Ongoing implementation from 2010 through 2015. |
| 7 | CII Audits | CII, IRR | When possible, Burlingame provides commercial and industrial customers with assistance in conducting water audits and in determining ways to cost-effectively reduce water consumption, which includes inspection of plumbing fixtures, cooling equipment and irrigation methods. | Ongoing implementation from 2010 through 2015. |
| 7 | Leak identification program | SF, MF, CII | To minimize water loss within the system, the City conducts leak investigation and repair on a regular basis. Investigations are triggered by abnormally high water bills. When leaks in the system are detected, they are repaired by the City. Leaks on the customer's side of the meter are reported to the customer and the City advises them on repair. | Ongoing implementation from 2010 through 2015. |

Abbreviations:

AMI = Advanced Metering Infrastructure
BAWSCA = Bay Area Water Supply and Conservation Agency
CII = commercial, industrial, and institutional accounts
DMM = demand management measure
gpf = gallons per flush
HET = high-efficiency toilet
IRR = irrigation accounts
MF = multi-family residential accounts
SF = single family residential accounts

References:

1. BAWSCA, 2013. BAWSCA Annual Water Conservation Report, FY 2012-13. Bay Area Water Supply & Conservation Agency, 2013.

# 9. PLAN ADOPTION AND SUBMITTAL

The City of Burlingame's (Burlingame's) preparation of the Urban Water Management Plan (UWMP) began in October 2015 for completion in July 2016, with notifications and interactions between stakeholders as discussed further below.

## 9.1 NOTIFICATION OF UWMP PREPARATION

> *110621. (b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days before the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.*

On 2 February 2016, Burlingame sent a letter to San Mateo County informing them that Burlingame was in the process of updating its UWMP and soliciting their input in the update process. A listed of the entities contacted is provided in Table 1-1. The letter was sent more than 60 days before the public hearing as required by code. A sample outreach letter is included in Appendix B.

## 9.2 NOTIFICATION OF PUBLIC HEARING

> *10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.*

### 9.2.1 Notice to Cities and Counties

On 24 May 2016, Burlingame sent a letter to San Mateo County, BAWSCA, SFPUC, and all BAWSCA member agencies informing them the locations the document would be available for review and welcoming their input and comments on the document. The letter also informed the agencies that the UWMP would be made available for public review and that a public hearing would be held. A sample copy of the notification letter is included in Appendix B. The Draft 2015 UWMP was available for public review at the Burlingame City Hall and on Burlingame's website.

### 9.2.2 Notice to the Public

On 24 May 2016 and 2 June 2016, the City published a notice in the *Examiner – Boutique & Villager* daily newspaper informing the public that the 2015 UWMP would be available for public review at the Burlingame City Hall, libraries, and on the Burlingame website, consistent with requirements of California Government Code 6066[30]. The notice also informed the public that the 2015 UWMP public hearing would be held at Burlingame City Hall on 6 June 2016. Copies of the newspaper announcements are included in Appendix C

## 9.3 PUBLIC HEARING AND ADOPTION

> *10608.26 (a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:*
> *(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.*
> *(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.*
> *(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.*

As described above, Burlingame informed the public and the appropriate agencies of (1) its intent to prepare a UWMP, (2) where the UWMP was available for public review, and (3) when the public hearing regarding the UWMP would be held. All notifications were completed in compliance with the stipulations of Section 6066 of the Government Code.

This UWMP, including the updated Water Shortage Contingency Plan (Section 7 of this Plan), was adopted by Resolution No. 58-2016 by the Burlingame City Council during its 6 June 2016 meeting. A copy of the resolution is included in Appendix L.

[30] Government Code section 6066. Publication of notice pursuant to this section shall be once a week for two successive weeks. Two publications in a newspaper published once a week or oftener, with at least five days intervening between the respective publication dates not counting such publication dates, are sufficient. The period of notice commences upon the first day of publication and terminates at the end of the fourteenth day, including therein the first day.

## 9.4 PLAN SUBMITTAL

*10621. (d) An urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016.*
*10635. (b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.*
*10644. (a) (1) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption.*
*10644. (a) (2) The plan, or amendments to the plan, submitted to the department pursuant to paragraph (1) shall be submitted electronically.*

A copy of the adopted 2015 UWMP including any amendments will be provided to the Department of Water Resources (DWR), the California State Library, San Mateo County, and SFPUC within 30 days of the adoption (Appendix M). An electronic copy of the adopted 2015 UWMP will be submitted to the DWR using the DWR online submittal tool.

## 9.5 PUBLIC AVAILABILITY

*10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.*

A copy of the adopted 2015 UWMP will be available for public review in the Burlingame City Hall during normal business hours and on the Burlingame website within 30 days after filing the plan with DWR.

## 10. REFERENCES

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# APPENDIX A:
# DWR STANDARD TABLES

| Table 2-1 Retail Only: Public Water Systems | | | |
|---|---|---|---|
| Public Water System Number | Public Water System Name | Number of Municipal Connections 2015 | Volume of Water Supplied 2015 |
| 4110003 | City of Burlingame | 9,137 | 1,283 |
| | **TOTAL** | 9,137 | 1,283 |
| NOTES: | | | |

| Table 2-2: Plan Identification | | | |
|---|---|---|---|
| **Select Only One** | **Type of Plan** | | **Name of RUWMP or Regional Alliance** *if applicable* *drop down list* |
| ☑ | **Individual UWMP** | | |
| | ☐ | Water Supplier is also a member of a RUWMP | |
| | ☐ | Water Supplier is also a member of a Regional Alliance | |
| ☐ | **Regional Urban Water Management Plan (RUWMP)** | | |
| NOTES: | | | |

| Table 2-3: Agency Identification | |
|---|---|
| Type of Agency (select one or both) | |
| ☐ | Agency is a wholesaler |
| ☑ | Agency is a retailer |
| Fiscal or Calendar Year (select one) | |
| ☐ | UWMP Tables Are in Calendar Years |
| ☑ | UWMP Tables Are in Fiscal Years |
| If Using Fiscal Years Provide Month and Date that the Fiscal Year Begins (mm/dd) | |
| *07/01* | |
| Units of Measure Used in UWMP (select from Drop down) | |
| Unit | MG |
| NOTES: | |

| Table 2-4 Retail: Water Supplier Information Exchange |
| --- |
| The retail supplier has informed the following wholesale supplier(s) of projected water use in accordance with CWC 10631. |
| Wholesale Water Supplier Name *(Add additional rows as needed)* |
| San Fransisco Public Utilities Commission (SFPUC) |
| NOTES: |

| Table 3-1 Retail: Population - Current and Projected | | | | | | |
|---|---|---|---|---|---|---|
| Population Served | 2015 | 2020 | 2025 | 2030 | 2035 | 2040*(opt)* |
| | 31,109 | 32,793 | 34,477 | 36,162 | 37,846 | 39,530 |
| NOTES: | | | | | | |

| Table 4-1 Retail: Demands for Potable and Raw Water - Actual | | | |
|---|---|---|---|
| Use Type<br>*(Add additional rows as needed)* | 2015 Actual | | |
| *Drop down list*<br>*May select each use multiple times*<br>*These are the only Use Types that will be recognized by the WUEdata online submittal tool* | Additional Description<br>*(as needed)* | Level of Treatment When Delivered<br>*Drop down list* | Volume |
| Single Family | - | Drinking Water | 523 |
| Multi-Family | - | Drinking Water | 230 |
| Commercial | - | Drinking Water | 167 |
| Industrial | - | Drinking Water | 167 |
| Institutional/Governmental | - | Drinking Water | 62 |
| Landscape | - | Drinking Water | 63 |
| Other | fire services | Drinking Water | 1 |
| Other | Unmetered water consumption | Drinking Water | 4 |
| Losses | - | Drinking Water | 66 |
| | | **TOTAL** | 1,283 |
| NOTES: | | | |

| Table 4-2 Retail: Demands for Potable and Raw Water - Projected | | | | | | |
|---|---|---|---|---|---|---|
| Use Type *(Add additional rows as needed)* | Additional Description *(as needed)* | Projected Water Use *Report To the Extent that Records are Available* | | | | |
| *Drop down list* *May select each use multiple times* *These are the only Use Types that will be recognized by the WUEdata online submittal tool* | | 2020 | 2025 | 2030 | 2035 | 2040-opt |
| Single Family | - | 696 | 713 | 730 | 751 | 775 |
| Multi-Family | - | 284 | 286 | 289 | 294 | 301 |
| Commercial | - | 267 | 264 | 268 | 273 | 277 |
| Industrial | - | 37 | 39 | 41 | 43 | 45 |
| Institutional/Governmental | - | 227 | 238 | 249 | 260 | 271 |
| Landscape | - | 97 | 103 | 108 | 114 | 119 |
| Other | - | 2 | 2 | 2 | 2 | 3 |
| Losses | - | 138 | 144 | 151 | 158 | 165 |
| | **TOTAL** | 1,749 | 1,790 | 1,839 | 1,895 | 1,956 |
| NOTES: | | | | | | |

| Table 4-3 Retail: Total Water Demands | | | | | | |
|---|---|---|---|---|---|---|
| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 *(opt)* |
| Potable and Raw Water *From Tables 4-1 and 4-2* | 1,283 | 1,749 | 1,790 | 1,839 | 1,895 | 1,956 |
| Recycled Water Demand* *From Table 6-4* | 0 | 0 | 0 | 0 | 0 | 0 |
| **TOTAL WATER DEMAND** | 1,283 | 1,749 | 1,790 | 1,839 | 1,895 | 1,956 |
| **Recycled water demand fields will be blank until Table 6-4 is complete.* | | | | | | |
| NOTES: | | | | | | |

| Table 4-4 Retail: 12 Month Water Loss Audit Reporting | |
|---|---|
| Reporting Period Start Date (mm/yyyy) | Volume of Water Loss* |
| 07/2014 | 66 |
| ** Taken from the field "Water Losses" (a combination of apparent losses and real losses) from the AWWA worksheet.* | |
| NOTES: | |

| Table 4-5 Retail Only: Inclusion in Water Use Projections | |
|---|---|
| Are Future Water Savings Included in Projections?<br>(Refer to Appendix K of UWMP Guidebook)<br>*Drop down list (y/n)* | Yes |
| If "Yes" to above, state the section or page number, in the cell to the right, where citations of the codes, ordinances, etc... utilized in demand projections are found. | Location in UWMP: Section 3.2.4 |
| Are Lower Income Residential Demands Included In Projections?<br>*Drop down list (y/n)* | Yes |
| NOTES: | |

| **Table 5-1 Baselines and Targets Summary**<br>*Retail Agency or Regional Alliance Only* | | | | | |
|---|---|---|---|---|---|
| Baseline Period | Start Year | End Year | Average Baseline GPCD* | 2015 Interim Target * | Confirmed 2020 Target* |
| 10-15 year | *1996* | *2005* | *169* | *152* | *135* |
| 5 Year | *2003* | *2007* | *165* | | |
| *All values are in Gallons per Capita per Day (GPCD) | | | | | |
| NOTES: | | | | | |

**Table 5-2: 2015 Compliance**

*Retail Agency or Regional Alliance Only*

| Actual 2015 GPCD* | 2015 Interim Target GPCD* | Optional Adjustments to 2015 GPCD<br>Enter "0" if no adjustment is made *From Methodology 8* | | | | | 2015 GPCD* *(Adjusted if applicable)* | Did Supplier Achieve Targeted Reduction for 2015? Y/N |
|---|---|---|---|---|---|---|---|---|
| | | Extraordinary Events* | Economic Adjustment* | Weather Normalization* | TOTAL Adjustments* | Adjusted 2015 GPCD* | | |
| 113 | 152 | 0 | 0 | 0 | 0 | 113 | 113 | Yes |

**All values are in Gallons per Capita per Day (GPCD)*

NOTES:

| Table 6-1 Retail: Groundwater Volume Pumped | | | | | | |
|---|---|---|---|---|---|---|
| ☑ | Supplier does not pump groundwater.<br>The supplier will not complete the table below. | | | | | |
| Groundwater Type<br>*Drop Down List*<br>*May use each category multiple times* | Location or Basin Name | 2011 | 2012 | 2013 | 2014 | 2015 |
| *Add additional rows as needed* | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | **TOTAL** | 0 | 0 | 0 | 0 | 0 |
| NOTES: | | | | | | |

| Table 6-2 Retail: Wastewater Collected Within Service Area in 2015 | | | | | | |
|---|---|---|---|---|---|---|
| ☐ | There is no wastewater collection system. The supplier will not complete the table below. | | | | | |
| | Percentage of 2015 service area covered by wastewater collection system *(optional)* | | | | | |
| | Percentage of 2015 service area population covered by wastewater collection system *(optional)* | | | | | |
| **Wastewater Collection** | | | **Recipient of Collected Wastewater** | | | |
| Name of Wastewater Collection Agency | Wastewater Volume Metered or Estimated? *Drop Down List* | Volume of Wastewater Collected from UWMP Service Area 2015 | Name of Wastewater Treatment Agency Receiving Collected Wastewater | Treatment Plant Name | Is WWTP Located Within UWMP Area? *Drop Down List* | Is WWTP Operation Contracted to a Third Party? *(optional)* *Drop Down List* |
| City of Burlingame | Metered | 994 | City of Burlingame | Burlingame Wastewater Treatment Plant | No | No |
| **Total Wastewater Collected from Service Area in 2015:** | | 994 | | | | |
| NOTES: | | | | | | |

| Table 6-3 Retail: Wastewater Treatment and Discharge Within Service Area in 2015 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| ☑ | No wastewater is treated or disposed of within the UWMP service area.<br>The supplier will not complete the table below. | | | | | | | | | |
| | | | | | | | 2015 volumes | | | |
| Wastewater Treatment Plant Name | Discharge Location Name or Identifier | Discharge Location Description | Wastewater Discharge ID Number *(optional)* | Method of Disposal *Drop down list* | Does This Plant Treat Wastewater Generated Outside the Service Area? | Treatment Level *Drop down list* | Wastewater Treated | Discharged Treated Wastewater | Recycled Within Service Area | Recycled Outside of Service Area |
| *Add additional rows as needed* | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | | | | | |
| | | | | | | **Total** | 0 | 0 | 0 | 0 |
| NOTES: | | | | | | | | | | |

| Table 6-4 Retail: Current and Projected Recycled Water Direct Beneficial Uses Within Service Area | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| ☑ | Recycled water is not used and is not planned for use within the service area of the supplier.<br>The supplier will not complete the table below. | | | | | | | |
| Name of Agency Producing (Treating) the Recycled Water: | | | | | | | | |
| Name of Agency Operating the Recycled Water Distribution System: | | | | | | | | |
| Supplemental Water Added in 2015 | | | | | | | | |
| Source of 2015 Supplemental Water | | | | | | | | |
| Beneficial Use Type | General Description of 2015 Uses | Level of Treatment<br>*Drop down list* | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 (opt) |
| Agricultural irrigation | | | | | | | | |
| Landscape irrigation (excludes golf courses) | | | | | | | | |
| Golf course irrigation | | | | | | | | |
| Commercial use | | | | | | | | |
| Industrial use | | | | | | | | |
| Geothermal and other energy production | | | | | | | | |
| Seawater intrusion barrier | | | | | | | | |
| Recreational impoundment | | | | | | | | |
| Wetlands or wildlife habitat | | | | | | | | |
| Groundwater recharge (IPR)* | | | | | | | | |
| Surface water augmentation (IPR)* | | | | | | | | |
| Direct potable reuse | | | | | | | | |
| Other *(Provide General Description)* | | | | | | | | |
| | | **Total:** | 0 | 0 | 0 | 0 | 0 | 0 |
| **IPR - Indirect Potable Reuse* | | | | | | | | |
| NOTES: | | | | | | | | |

| Table 6-5 Retail: 2010 UWMP Recycled Water Use Projection Compared to 2015 Actual | | | |
|---|---|---|---|
| ☑ | Recycled water was not used in 2010 nor projected for use in 2015.<br>The supplier will not complete the table below. | | |
| **Use Type** | | **2010 Projection for 2015** | **2015 Actual Use** |
| Agricultural irrigation | | | |
| Landscape irrigation (excludes golf courses) | | | |
| Golf course irrigation | | | |
| Commercial use | | | |
| Industrial use | | | |
| Geothermal and other energy production | | | |
| Seawater intrusion barrier | | | |
| Recreational impoundment | | | |
| Wetlands or wildlife habitat | | | |
| Groundwater recharge (IPR) | | | |
| Surface water augmentation (IPR) | | | |
| Direct potable reuse | | | |
| Other | *Type of Use* | | |
| | **Total** | 0 | 0 |
| NOTES: | | | |

| Table 6-6 Retail: Methods to Expand Future Recycled Water Use | | | |
|---|---|---|---|
| ☑ | Supplier does not plan to expand recycled water use in the future. Supplier will not complete the table below but will provide narrative explanation. | | |
| 58 | Provide page location of narrative in UWMP | | |
| Name of Action | Description | Planned Implementation Year | Expected Increase in Recycled Water Use |
| *Add additional rows as needed* | | | |
| | | | |
| | | | |
| | | | |
| | | **Total** | 0 |
| NOTES: | | | |

| Table 6-7 Retail: Expected Future Water Supply Projects or Programs | | | | | | |
|---|---|---|---|---|---|---|
| ☑ | No expected future water supply projects or programs that provide a quantifiable increase to the agency's water supply. Supplier will not complete the table below. | | | | | |
| ☐ | Some or all of the supplier's future water supply projects or programs are not compatible with this table and are described in a narrative format. | | | | | |
| | Provide page location of narrative in the UWMP | | | | | |
| Name of Future Projects or Programs | Joint Project with other agencies? | | Description (if needed) | Planned Implementation Year | Planned for Use in Year Type *Drop Down List* | Expected Increase in Water Supply to Agency *This may be a range* |
| | *Drop Down List (y/n)* | *If Yes, Agency Name* | | | | |
| *Add additional rows as needed* | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |
| NOTES: | | | | | | |

| Table 6-8 Retail: Water Supplies — Actual | | | | |
|---|---|---|---|---|
| Water Supply | Additional Detail on Water Supply | 2015 | | |
| *Drop down list*<br>*May use each category multiple times.*<br>*These are the only water supply categories that will be recognized by the WUEdata online submittal tool* | | Actual Volume | Water Quality<br>*Drop Down List* | Total Right or Safe Yield *(optional)* |
| *Add additional rows as needed* | | | | |
| Purchased or Imported Water | SFPUC RWS | 1,283 | Drinking Water | |
| | **Total** | 1,283 | | 0 |

NOTES: The water purchased includes water purchased for use within the Burlingame services area and does not include water that was purchased from SFPUC and sold to another agency.

| Table 6-9 Retail: Water Supplies — Projected | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Water Supply | Additional Detail on Water Supply | Projected Water Supply *Report To the Extent Practicable* | | | | | | | | | |
| *Drop down list May use each category multiple times. These are the only water supply categories that will be recognized by the WUEdata online submittal tool* | | **2020** | | **2025** | | **2030** | | **2035** | | **2040** *(opt)* | |
| | | Reasonably Available Volume | Total Right or Safe Yield *(optional)* | Reasonably Available Volume | Total Right or Safe Yield *(optional)* | Reasonably Available Volume | Total Right or Safe Yield *(optional)* | Reasonably Available Volume | Total Right or Safe Yield *(optional)* | Reasonably Available Volume | Total Right or Safe Yield *(optional)* |
| *Add additional rows as needed* | | | | | | | | | | | |
| | | 1,909 | | 1,909 | | 1,909 | | 1,909 | | 1,909 | |
| | **Total** | 1,909 | 0 | 1,909 | 0 | 1,909 | 0 | 1,909 | 0 | 1,909 | 0 |
| NOTES: | | | | | | | | | | | |

| Table 7-1 Retail: Basis of Water Year Data | | | |
|---|---|---|---|
| **Year Type** | **Base Year** *If not using a calendar year, type in the last year of the fiscal, water year, or range of years, for example, water year 1999-2000, use 2000* | **Available Supplies if Year Type Repeats** | |
| | | ☐ Quantification of available supplies is not compatible with this table and is provided elsewhere in the UWMP. Location _____ | |
| | | ☐ Quantification of available supplies is provided in this table as either volume only, percent only, or both. | |
| | | **Volume Available** | **% of Average Supply** |
| Average Year | FY 1987-88 | 1,909 | 100% |
| Single-Dry Year | FY 1989-90 | 1,628 | 85% |
| Multiple-Dry Years 1st Year | FY 1989-90 | 1,628 | 85% |
| Multiple-Dry Years 2nd Year | FY 1990-91 | 1,376 | 72% |
| Multiple-Dry Years 3rd Year | FY 1991-92 | 1,376 | 72% |
| Agency may use multiple versions of Table 7-1 if different water sources have different base years and the supplier chooses to report the base years for each water source separately. If an agency uses multiple versions of Table 7-1, in the "Note" section of each table, state that multiple versions of Table 7-1 are being used and identify the particular water source that is being reported in each table. | | | |
| NOTES: | | | |

| Table 7-2 Retail: Normal Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 *(Opt)* |
| Supply totals *(autofill from Table 6-9)* | 1,909 | 1,909 | 1,909 | 1,909 | 1,909 |
| Demand totals *(autofill from Table 4-3)* | 1,749 | 1,790 | 1,839 | 1,895 | 1,956 |
| Difference | 160 | 119 | 70 | 14 | (47) |
| NOTES: | | | | | |

| Table 7-3 Retail: Single Dry Year Supply and Demand Comparison | | | | | |
|---|---|---|---|---|---|
| | 2020 | 2025 | 2030 | 2035 | 2040 (Opt) |
| Supply totals | 1,628 | 1,628 | 1,628 | 1,628 | 1,628 |
| Demand totals | 1,749 | 1790.333 | 1,839 | 1,895 | 1,956 |
| Difference | (121) | (162) | (211) | (267) | (328) |
| NOTES: | | | | | |

| Table 7-4 Retail: Multiple Dry Years Supply and Demand Comparison | | | | | | |
|---|---|---|---|---|---|---|
| | | 2020 | 2025 | 2030 | 2035 | 2040 (Opt) |
| First year | Supply totals | 1,628 | 1,628 | 1,628 | 1,628 | 1,628 |
| | Demand totals | 1,749 | 1,790 | 1,839 | 1,895 | 1,956 |
| | Difference | (121) | (162) | (211) | (267) | (328) |
| Second year | Supply totals | 1,376 | 1,376 | 1,376 | 1,376 | 1,376 |
| | Demand totals | 1,749 | 1,790 | 1,839 | 1,895 | 1,956 |
| | Difference | (373) | (414) | (462) | (519) | (580) |
| Third year | Supply totals | 1,376 | 1,376 | 1,376 | 1,376 | 1,376 |
| | Demand totals | 1,749 | 1,790 | 1,839 | 1,895 | 1,956 |
| | Difference | (373) | (414) | (462) | (519) | (580) |
| NOTES: | | | | | | |

| Table 8-1 Retail<br>Stages of Water Shortage Contingency Plan | | |
|---|---|---|
| Stage | Complete Both | |
| | Percent Supply Reduction[1]<br>*Numerical value as a percent* | Water Supply Condition<br>*(Narrative description)* |
| *Add additional rows as needed* | | |
| 1 | N/A | In force at all times. |
| 2 | Up to 5% | Declaration by Burlingame City Council in accordance with Chapter 15.06 of the Burlingame Municipal Code or upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use of up to 5% due to water supply shortages or an emergency. |
| 3 | Up to 15% | Declaration by Burlingame City Council in accordance with Chapter 15.06 of the Burlingame Municipal Code or upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 6% to 15% due to water supply shortages or emergency. |
| 4 | Up to 30% | Declaration by Burlingame City Council in accordance with Chapter 15.06 of the Burlingame Municipal Code or upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 16% to 30% due to water supply shortages or emergency. |
| 5 | Up to 50% | Declaration by Burlingame City Council in accordance with Chapter 15.06 of the Burlingame Municipal Code or upon the determination that the SFPUC or another governing authority (e.g., the SWRCB) has required a voluntary or mandatory reduction in water use from 31% to 50% due to water supply shortages or emergency. |
| [1] *One stage in the Water Shortage Contingency Plan must address a water shortage of 50%.* | | |
| NOTES: | | |

| Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses | | | |
|---|---|---|---|
| Stage | Restrictions and Prohibitions on End Users<br>*Drop down list*<br>*These are the only categories that will be accepted by the WUEdata online submittal tool* | Additional Explanation or Reference<br>*(optional)* | Penalty, Charge, or Other Enforcement?<br>*Drop Down List* |
| 1 | Other - Require automatic shut of hoses | Hoses must be equipped with a shut-off valve for washing vehicles, sidewalks, walkways, or buildings. | Yes |
| 1 | Other - Customers must repair leaks, breaks, and malfunctions in a timely manner | Broken or defective plumbing and irrigation systems must be repaired or replaced within a reasonable period. | Yes |
| 1 | Landscape - Restrict or prohibit runoff from landscape irrigation | Potable water shall not be used to water outdoor landscapes in a manner that causes runoff onto non-irrigated areas, walkways, roadways, parking lots, or other hard surfaces. | Yes |
| 1 | Landscape - Limit landscape irrigation to specific times | Potable water cannot be applied to outdoor landscapes during and up to 48 hours after measurable rainfall. | Yes |
| 1 | Other - Prohibit use of potable water for washing hard surfaces | Potable water shall not be applied in any manner to any driveway or sidewalk, except when necessary to address immediate health or safety concerns. | Yes |
| 1 | Other | Irrigation with potable water of ornamental turf on public street medians is prohibited. | Yes |
| 1 | Water Features - Restrict water use for decorative water features, such as fountains | Use only re-circulated or recycled water to operate ornamental fountains. | Yes |
| 1 | CII - Restaurants may only serve water upon request | Restaurants and other food service operations shall serve water to customers only upon request. | Yes |
| 1 | CII - Lodging establishment must offer opt out of linen service | Hotels and motels shall provide guests an option whether to launder towels and linens daily. Hotels and motels shall prominently display notice of this option in each bathroom using clear and easily understood language. | Yes |
| 1 | Other | Other measures as may be approved by Resolution of the City Council. | Yes |

| Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses | | | |
|---|---|---|---|
| Stage | Restrictions and Prohibitions on End Users<br>*Drop down list*<br>*These are the only categories that will be accepted by the WUEdata online submittal tool* | Additional Explanation or Reference<br>*(optional)* | Penalty, Charge, or Other Enforcement?<br>*Drop Down List* |
| 2 | Other | Continue with actions and measures from Stage 1 except where superseded by more stringent requirements. | Yes |
| 2 | Landscape - Limit landscape irrigation to specific times | Residential and commercial landscape irrigation with potable water is prohibited between the hours of 8:00 a.m. and 6:00 p.m. | Yes |
| 2 | Landscape - Limit landscape irrigation to specific days | Residential and commercial landscape irrigation with potable water is limited to no more than three (3) days per week on a schedule established by the Director and posted on the City's website. | Yes |
| 2 | Other | Other measures as may be approved by Resolution of the City Council. | Yes |
| 3 | Other | Continue with actions and measures from Stages 1 and 2 except where superseded by more stringent requirements. | Yes |
| 3 | Landscape - Other landscape restriction or prohibition | Irrigation with potable water outside of newly constructed homes and buildings not delivered by drip or microspray is prohibited. | Yes |
| 3 | Other | Potable water shall not be used for street cleaning. | Yes |
| 3 | Pools and Spas - Require covers for pools and spas | Pools, spas, and hot tubs shall be covered when not in use. | Yes |
| 3 | CII - Other CII restriction or prohibition | Prohibit installation of single-pass cooling systems | Yes |
| 3 | Landscape - Limit landscape irrigation to specific times | Residential and commercial landscape irrigation with potable water is prohibited between the hours of 8:00 a.m. and 6:00 p.m. and for more than fifteen (15) minutes per day per zone. | Yes |
| 3 | Landscape - Limit landscape irrigation to specific days | Residential and commercial landscape irrigation with potable water is limited to no more than two (2) days per week on a schedule established by the Director and posted on the City's website. | Yes |
| 3 | Other | Other measures as may be approved by Resolution of the City Council. | Yes |

| Table 8-2 Retail Only: Restrictions and Prohibitions on End Uses | | | |
|---|---|---|---|
| Stage | Restrictions and Prohibitions on End Users<br>*Drop down list*<br>*These are the only categories that will be accepted by the WUEdata online submittal tool* | Additional Explanation or Reference<br>*(optional)* | Penalty, Charge, or Other Enforcement?<br>*Drop Down List* |
| 4 | Other | Continue with actions and measures from Stages 1, 2 and 3 except where superseded by more stringent requirements. | Yes |
| 4 | Landscape - Other landscape restriction or prohibition | No new turf shall be installed at new construction sites. | Yes |
| 4 | Other - Prohibit vehicle washing except at facilities using recycled or recirculating water | Prohibit vehicle washing except at facilities using recycled or recirculating water. | Yes |
| 4 | Landscape - Limit landscape irrigation to specific times | Residential and commercial landscape irrigation with potable water is prohibited between the hours of 8:00 a.m. and 6:00 p.m. and for more than ten (10) minutes per day per zone. | Yes |
| 4 | Landscape - Limit landscape irrigation to specific days | Residential and commercial landscape irrigation with potable water is limited to no more than one (1) day per week on a schedule established by the Director and posted on the City's website. | Yes |
| 4 | Other | Water budgets established for new water service accounts. | Yes |
| 4 | Other | Other measures as may be approved by Resolution of the City Council. | Yes |
| 5 | Other | Continue with actions and measures from Stages 1 through 4 except where superseded by more stringent requirements. | Yes |
| 5 | Landscape - Prohibit certain types of landscape irrigation | Turf irrigation is prohibited at all times. | Yes |
| 5 | Landscape - Other landscape restriction or prohibition | Existing irrigation systems shall not be expanded. | Yes |
| 5 | Other | Water budgets established for all customer accounts. | Yes |
| 5 | Other | No new potable water service shall be provided, no new temporary meters or permanent meters shall be provided, and no statements of immediate ability to serve or provide potable water service (such as, will-serve letters, certificates or letters of availability) shall be issued by the City, with exceptions. | Yes |
| 5 | Other | Other measures as may be approved by Resolution of the City Council. | Yes |
| NOTES: | | | |

| Table 8-3 Retail Only:<br>Stages of Water Shortage Contingency Plan - Consumption Reduction Methods | | |
|---|---|---|
| Stage | Consumption Reduction Methods by Water Supplier<br>*Drop down list*<br>*These are the only categories that will be accepted by the WUEdata online submittal tool* | Additional Explanation or Reference<br>*(optional)* |
| 2 | Expand Public Information Campaign | Inform customers that there is a water shortage emergency and the list of actions they can take to reduce water use (e.g., via direct mail, bill inserts, etc.). |
| 2 | Expand Public Information Campaign | Increase public outreach, including information regarding fines or penalties for non-compliance. |
| 2 | Expand Public Information Campaign | Conduct coordination with BAWSCA and SFPUC. Conduct in-house training so City staff are prepared to respond to customer calls, reports and complaints, and to support enforcement actions. |
| 3 | Other | Continue with actions and measures from Stage 2. |
| 3 | Expand Public Information Campaign | Increase public outreach, including a dedicated customer service hotline. |
| 3 | Increase Water Waste Patrols | Schedule staff for enforcement and customer service, including on weekends. May include hiring additional, temporary staff. |
| 3 | Decrease Line Flushing | Reduce frequency of water main flushing. |
| 3 | Other | Inform local fire department of water supply status and request cooperation in reducing of fire training exercises that use water. |
| 3 | Implement or Modify Drought Rate Structure or Surcharge | Evaluate potential implementation of drought surcharge on water rates. |
| 3 | Other | Suspend issuance of building permits for new residential pools, spas, and hot tubs. |
| 4 | Other | Continue with actions and measures from Stages 2 and 3. |
| 4 | Expand Public Information Campaign | Increase public outreach, including hosting public events and workshops. |
| 4 | Increase Water Waste Patrols | Increase enforcement and water waste patrols. |
| 4 | Decrease Line Flushing | Suspend routine flushing of water mains. |
| 4 | Increase Frequency of Meter Reading | Convert to more frequent water reading and billing. |

| Table 8-3 Retail Only:<br>Stages of Water Shortage Contingency Plan - Consumption Reduction Methods | | |
|---|---|---|
| Stage | Consumption Reduction Methods by Water Supplier<br>*Drop down list*<br>*These are the only categories that will be accepted by the WUEdata online submittal tool* | Additional Explanation or Reference<br>*(optional)* |
| 4 | Offer Water Use Surveys | Offer water use surveys to the top 10% of commercial, industrial, and institutional water users. |
| 4 | Other | Develop water budgets for new water service accounts and notice those accounts appropriately. |
| 5 | Other | Continue with actions and measures from Stages 2, 3 and 4. |
| 5 | Expand Public Information Campaign | Increase public outreach. |
| 5 | Other | Develop water budgets for all accounts and notice those accounts appropriately. |
| 5 | Other | Perform an audit of distribution system to reduce system water loss. |
| NOTES: | | |

| Table 8-4 Retail: Minimum Supply Next Three Years | | | |
|---|---|---|---|
| | 2016 | 2017 | 2018 |
| Available Water Supply | 1,628 | 1,376 | 1,376 |
| NOTES: | | | |

| Table 10-1 Retail: Notification to Cities and Counties | | |
|---|---|---|
| City Name | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| City of Burlingame | ☑ | ☑ |
| County Name<br>*Drop Down List* | 60 Day Notice | Notice of Public Hearing |
| *Add additional rows as needed* | | |
| San Mateo County | ☑ | ☑ |
| NOTES: | | |

# APPENDIX B:
# UWMP AGENCY NOTIFICATION LETTER

# The City of Burlingame

PUBLIC WORKS DEPARTMENT
TEL: (650) 558-7230
FAX: (650) 685-9310

CITY HALL - 501 PRIMROSE ROAD
BURLINGAME, CALIFORNIA 94010-3997
FAX: (650) 696-1598

CORPORATION YARD
(650) 558-7670

February 2, 2016

County of San Mateo
James Porter
Director of Public Works
555 County Center
5th Floor
Redwood City, CA, 94063

Re: **Notice of Preparation of Urban Water Management Plan - 2015 Update**

The Urban Water Management Planning Act (California Water Code §10608–10656) requires the City of Burlingame ("City") to update its Urban Water Management Plan ("UWMP") every 5 years. The City is currently reviewing its existing UWMP, which was updated in 2011, and considering revisions to the document. The updated UWMP is due by July 1, 2016. We invite your agency's participation in this revision process.

A draft of the 2015 UWMP will be made available for public review and a public hearing will be scheduled later this year. In the meantime, if you would like more information regarding the City's 2010 UWMP and the schedule for preparing the 2015 UWMP, or if you would like to participate in the preparation of the 2015 UWMP, please contact Art Morimoto at:

City of Burlingame
501 Primrose Road
Burlingame, CA, 94010
Phone: (650)-558-7246
FAX: (650)-685-9310
amorimoto@burlingame.org

Sincerely,

Art Morimoto

Art Morimoto
Assistant Public Works Director

# The City of Burlingame

PUBLIC WORKS DEPARTMENT
TEL: (650) 558-7230
FAX: (650) 685-9310

CITY HALL - 501 PRIMROSE ROAD
BURLINGAME, CALIFORNIA 94010-3997
www.burlingame.org

CORPORATION YARD
TEL: (650) 558-7670
FAX: (650) 696-1598

May 23, 2016

Member Agency
Bay Area Water Supply and Conservation Agency

Re: Notice of Public Hearing for Draft Urban Water Management Plan – 2015 Update, Including Urban Water Use Targets and Water Shortage Contingency Plan Update

The Urban Water Management Plan Act (California Water Code Section 10610 – 10657) requires the City of Burlingame to update its Urban Water Management Plan (UWMP) by July 1, 2016. Additionally, California law requires that, in conjunction with the update to the Urban Water Management Plan, the community be given an opportunity to give input on the City of Burlingame's urban water use target in the Urban Water Management Plan, any impacts to the local economy, and City of Burlingame's method of determining its urban water use target. Burlingame is conducting a public hearing prior to the City Council's adoption of the 2015 UWMP and we invite your agency's participation in this process.

The City of Burlingame will hold a public hearing to adopt an urban water use target and updates to its Urban Water Management Plan for 2015-2020. The public hearing will be held at 7:00 pm on Monday, June 6, 2016 at Burlingame City Hall, City Council Chambers, located at 501 Primrose Road, Burlingame, California 94010. Comments on the draft 2015 UWMP may be made prior to the public hearing to Mr. Art Morimoto at the address below, or at the public hearing. A draft of the 2015 UWMP will be available for review at the Burlingame Main Library located at 480 Primrose Road, Burlingame, California 94010, at City Hall, Public Works Department located at 501 Primrose Road, Burlingame, California 94010, and on the City's website at www.burlingame.org.

Yours very truly,

THE CITY OF BURLINGAME

Art Morimoto

Art Morimoto, P.E.
Public Works Department, Engineering Division
501 Primrose Road
Burlingame, CA 94010-3906
(650) 558-7230
amorimoto@burlingame.org

cc: Syed Murtuza, P.E., City of Burlingame
Ms. Nicole Sandkulla, BAWSCA

# The City of Burlingame

PUBLIC WORKS DEPARTMENT
TEL: (650) 558-7230
FAX: (650) 685-9310

CITY HALL - 501 PRIMROSE ROAD
BURLINGAME, CALIFORNIA 94010-3997
www.burlingame.org

CORPORATION YARD
TEL: (650) 558-7670
FAX: (650) 696-1598

May 23, 2016

Ms. Paula Kehoe
SF Public Utilities Commission
525 Golden Gate Avenue
San Francisco, CA 94103

Re: Notice of Public Hearing for Draft Urban Water Management Plan – 2015 Update, Including Urban Water Use Targets and Water Shortage Contingency Plan Update

The Urban Water Management Plan Act (California Water Code Section 10610 – 10657) requires the City of Burlingame to update its Urban Water Management Plan (UWMP) by July 1, 2016. Additionally, California law requires that, in conjunction with the update to the Urban Water Management Plan, the community be given an opportunity to give input on the City of Burlingame's urban water use target in the Urban Water Management Plan, any impacts to the local economy, and City of Burlingame's method of determining its urban water use target. Burlingame is conducting a public hearing prior to the City Council's adoption of the 2015 UWMP and we invite your agency's participation in this process.

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Yours very truly,

THE CITY OF BURLINGAME

Art Morimoto

Art Morimoto, P.E.
Public Works Department, Engineering Division
501 Primrose Road
Burlingame, CA 94010-3906
(650) 558-7230
amorimoto@burlingame.org

cc: Syed Murtuza, P.E., City of Burlingame

# The City of Burlingame

PUBLIC WORKS DEPARTMENT
TEL: (650) 558-7230
FAX: (650) 685-9310

CITY HALL - 501 PRIMROSE ROAD
BURLINGAME, CALIFORNIA 94010-3997
www.burlingame.org

CORPORATION YARD
TEL: (650) 558-7670
FAX: (650) 696-1598

May 23, 2016

Mr. James Porter
County of San Mateo
555 County Center, 5th Floor
Redwood City, CA 94063

Re: Notice of Public Hearing for Draft Urban Water Management Plan – 2015 Update, Including Urban Water Use Targets and Water Shortage Contingency Plan Update

The Urban Water Management Plan Act (California Water Code Section 10610 – 10657) requires the City of Burlingame to update its Urban Water Management Plan (UWMP) by July 1, 2016. Additionally, California law requires that, in conjunction with the update to the Urban Water Management Plan, the community be given an opportunity to give input on the City of Burlingame's urban water use target in the Urban Water Management Plan, any impacts to the local economy, and City of Burlingame's method of determining its urban water use target. Burlingame is conducting a public hearing prior to the City Council's adoption of the 2015 UWMP and we invite your agency's participation in this process.

The City of Burlingame will hold a public hearing to adopt an urban water use target and updates to its Urban Water Management Plan for 2015-2020. The public hearing will be held at 7:00 pm on Monday, June 6, 2016 at Burlingame City Hall, City Council Chambers, located at 501 Primrose Road, Burlingame, California 94010. Comments on the draft 2015 UWMP may be made prior to the public hearing to Mr. Art Morimoto at the address below, or at the public hearing. A draft of the 2015 UWMP will be available for review at the Burlingame Main Library located at 480 Primrose Road, Burlingame, California 94010, at City Hall, Public Works Department located at 501 Primrose Road, Burlingame, California 94010, and on the City's website at www.burlingame.org.

Yours very truly,

THE CITY OF BURLINGAME

Art Morimoto

Art Morimoto, P.E.
Public Works Department, Engineering Division
501 Primrose Road
Burlingame, CA 94010-3906
(650) 558-7230
amorimoto@burlingame.org

cc: Syed Murtuza, P.E., City of Burlingame

# APPENDIX C:
# UWMP PUBLIC NOTIFICATION NOTICES

**EXAMINER - BOUTIQUE & VILLAGER**

This space for filing stamp only

2317 BROADWAY #305, REDWOOD CITY, CA 94063
Telephone (650) 556-1556 / Fax (650) 692-7587

Meaghan Hassel Shearer
CITY OF BURLINGAME/CITY CLERKS OFFICE
501 PRIMROSE ROAD
BURLINGAME, CA - 94010

NPEN#: 2884577

# PROOF OF PUBLICATION

(2015.5 C.C.P.)

State of California )
County of SAN MATEO ) ss

Notice Type: HRG - NOTICE OF HEARING

Ad Description:

Legal Ad

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the EXAMINER - BOUTIQUE & VILLAGER, a newspaper published in the English language in the city of BURLINGAME, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of SAN MATEO, State of California, under date of 10/12/1992, Case No. 241938. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

05/24/2016

Executed on: 05/25/2016
At Los Angeles, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Signature

* A 0 0 0 0 0 4 1 1 0 6 9 0 *

**NOTICE OF PUBLIC HEARING URBAN WATER MANAGEMENT PLAN - 2015 UPDATE INCLUDING URBAN WATER USE TARGETS AND WATER SHORTAGE CONTINGENCY PLAN UPDATE**

The City of Burlingame is preparing a draft update of its Urban Water Management Plan (UWMP), which includes an update of its Water Shortage Contingency Plan (WSCP). Water agencies develop UWMPs in order to help ensure a reliable water supply sufficient to meet the future needs of their customers. The current UWMP was prepared in 2011 and, as required by California law, must be updated by July 1, 2016. Additionally, California law requires that, in conjunction with the update to the Urban Water Management Plan, the community be given an opportunity to give input on the City of Burlingame's urban water use target in the Urban Water Management Plan, any impacts to the local economy, and City of Burlingame's method of determining its urban water use target.

The City of Burlingame will hold a public hearing to adopt an urban water use target and updates to its Urban Water Management Plan for 2015-2020. The public hearing will be held at 7:00 pm on Monday, June 6, 2016 at Burlingame City Hall, City Council Chambers, located at 501 Primrose Road, Burlingame, California 94010. Comments on the draft 2015 UWMP may be made prior to the hearing to the address below, or at the public hearing. A draft of the 2015 UWMP will be available for review at the Burlingame Main Library located at 480 Primrose Road, Burlingame, California 94010, at City Hall, Public Works Department located at 501 Primrose Road, Burlingame, California 94010 and on the City's website at www.burlingame.org. If you have any questions regarding the draft 2015 UWMP, please contact:

Art Morimoto, P.E.
Public Works Department,
Engineering Division
501 Primrose Road
Burlingame, CA 94010-3906
(650) 558-7230
amorimoto@burlingame.org

5/24/16

**NPEN-2884577#**

**EXAMINER - BOUTIQUE & VILLAGER**

**EXAMINER - BOUTIQUE & VILLAGER**

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NPEN #: 2885671

# PROOF OF PUBLICATION

(2015.5 C.C.P.)

State of California )
County of SAN MATEO ) ss

Notice Type: HRG - NOTICE OF HEARING

Ad Description:

Legal Ad

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the EXAMINER - BOUTIQUE & VILLAGER, a newspaper published in the English language in the city of BURLINGAME, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of SAN MATEO, State of California, under date of 10/12/1992, Case No. 241938. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

06/02/2016

Executed on: 06/02/2016
At Los Angeles, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

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* A 0 0 0 0 0 4 1 1 9 8 8 3 *

**NOTICE OF PUBLIC HEARING URBAN WATER MANAGEMENT PLAN - 2015 UPDATE INCLUDING URBAN WATER USE TARGETS AND WATER SHORTAGE CONTINGENCY PLAN UPDATE**

**NPEN-2885671# EXAMINER - BOUTIQUE & VILLAGER**

The City of Burlingame is preparing a draft update of its Urban Water Management Plan (UWMP), which includes an update of its Water Shortage Contingency Plan (WSCP). Water agencies develop UWMPs in order to help ensure a reliable water supply sufficient to meet the future needs of their customers. The current UWMP was prepared in 2011 and, as required by California law, must be updated by July 1, 2016. Additionally, California law requires that, in conjunction with the update to the Urban Water Management Plan, the community be given an opportunity to give input on the City of Burlingame's urban water use target in the Urban Water Management Plan, any impacts to the local economy, and City of Burlingame's method of determining its urban water use target.

The City of Burlingame will hold a public hearing to adopt an urban water use target and updates to its Urban Water Management Plan for 2015-2020. The public hearing will be held at 7:00 pm on Monday, June 6, 2016 at Burlingame City Hall, City Council Chambers, located at 501 Primrose Road, Burlingame, California 94010. Comments on the draft 2015 UWMP may be made prior to the hearing to the address below, or at the public hearing. A draft of the 2015 UWMP will be available for review at the Burlingame Main Library located at 480 Primrose Road, Burlingame, California 94010, at City Hall, Public Works Department located at 501 Primrose Road, Burlingame, California 94010 and on the City's website at www.burlingame.org. If you have any questions regarding the draft 2015 UWMP, please contact:

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# APPENDIX D:
# COMPLETED UWMP CHECKLIST

| CWC Section | UWMP requirement | Subject | Guidebook Location | UWMP Section |
|---|---|---|---|---|
| 10620(b) | Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier. | Plan Preparation | Section 2.1 | Section 1.1 |
| 10620(d)(2) | Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable. | Plan Preparation | Section 2.5.2 | Section 1.2 and Table 1-1 |
| 10642 | Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. | Plan Preparation | Section 2.5.2 | Appendices B and C |
| 10631(a) | Describe the water supplier service area. | System Description | Section 3.1 | Section 2 |
| 10631(a) | Describe the climate of the service area of the supplier. | System Description | Section 3.3 | Section 2.2 and Table 2-3 |
| 10631(a) | Provide population projections for 2020, 2025, 2030, and 2035. | System Description | Section 3.4 | Section 2.1 and Table 2-1 |
| 10631(a) | Describe other demographic factors affecting the supplier's water management planning. | System Description | Section 3.4 | Section 2.1 and Table 2-2 |
| 10631(a) | Indicate the current population of the service area. | System Description and Baselines and Targets | Sections 3.4 and 5.4 | Sections 2.1 and 4.1 |
| 10631(e)(1) | Quantify past, current, and projected water use, identifying the uses among water use sectors. | System Water Use | Section 4.2 | Section 3 and Tables 3-1 through 3-4 |
| 10631(e)(3)(A) | Report the distribution system water loss for the most recent 12-month period available. | System Water Use | Section 4.3 | Section 3.1.3 and Table 3-2 |
| 10631.1(a) | Include projected water use needed for lower income housing projected in the service area of the supplier. | System Water Use | Section 4.5 | Section 3.2.3 and Table 3-5 |

| CWC Section | UWMP requirement | Subject | Guidebook Location | UWMP Section |
|---|---|---|---|---|
| 10608.20(b) | Retail suppliers shall adopt a 2020 water use target using one of four methods. | Baselines and Targets | Section 5.7 and App E | Section 4.3, Table 4-2, and Appendix G |
| 10608.20(e) | Retail suppliers shall provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data. | Baselines and Targets | Chapter 5 and App E | Section 4 and Appendix G |
| 10608.22 | Retail suppliers' per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use of the 5 year baseline. This does not apply is the suppliers base GPCD is at or below 100. | Baselines and Targets | Section 5.7.2 | Section 4.3 and Appendix E |
| 10608.24(a) | Retail suppliers shall meet their interim target by December 31, 2015. | Baselines and Targets | Section 5.8 and App E | Section 4.4 and Table 4-3 |
| 1608.24(d)(2) | If the retail supplier adjusts its compliance GPCD using weather normalization, economic adjustment, or extraordinary events, it shall provide the basis for, and data supporting the adjustment. | Baselines and Targets | Section 5.8.2 | N/A |
| 10608.36 | Wholesale suppliers shall include an assessment of present and proposed future measures, programs, and policies to help their retail water suppliers achieve targeted water use reductions. | Baselines and Targets | Section 5.1 | N/A |
| 10608.40 | Retail suppliers shall report on their progress in meeting their water use targets. The data shall be reported using a standardized form. | Baselines and Targets | Section 5.8 and App E | Section 4.5, Table 4-3, and Appendix E |
| 10631(b) | Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, 2030, and 2035. | System Supplies | Chapter 6 | Section 5, Tables 5-1 and 5-3 |
| 10631(b) | Indicate whether groundwater is an existing or planned source of water available to the supplier. | System Supplies | Section 6.2 | Section 5.2 |

| CWC Section | UWMP requirement | Subject | Guidebook Location | UWMP Section |
|---|---|---|---|---|
| 10631(b)(1) | Indicate whether a groundwater management plan has been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization. | System Supplies | Section 6.2.2 | Section 5.2.2 |
| 10631(b)(2) | Describe the groundwater basin. | System Supplies | Section 6.2.1 | Section 5.2.1 |
| 10631(b)(2) | Indicate if the basin has been adjudicated and include a copy of the court order or decree and a description of the amount of water the supplier has the legal right to pump. | System Supplies | Section 6.2.2 | Section 5.2.1 |
| 10631(b)(2) | For unadjudicated basins, indicate whether or not the department has identified the basin as overdrafted, or projected to become overdrafted. Describe efforts by the supplier to eliminate the long-term overdraft condition. | System Supplies | Section 6.2.3 | Section 5.2.1 |
| 10631(b)(3) | Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years | System Supplies | Section 6.2.4 | Section 5.2.3 |
| 10631(b)(4) | Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped. | System Supplies | Sections 6.2 and 6.9 | Section 5.2.4 |
| 10631(d) | Describe the opportunities for exchanges or transfers of water on a short-term or long- term basis. | System Supplies | Section 6.7 | Section 5.5 |
| 10631(g) | Describe the expected future water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years. | System Supplies | Section 6.8 | Section 5.6 |
| 10631(i) | Describe desalinated water project opportunities for long-term supply. | System Supplies | Section 6.6 | Section 5.4 |
| 10631(j) | Retail suppliers will include documentation that they have provided their wholesale supplier(s) – if any - with water use projections from that source. | System Supplies | Section 2.5.1 | Appendix M |

| CWC Section | UWMP requirement | Subject | Guidebook Location | UWMP Section |
|---|---|---|---|---|
| 10631(j) | Wholesale suppliers will include documentation that they have provided their urban water suppliers with identification and quantification of the existing and planned sources of water available from the wholesale to the urban supplier during various water year types. | System Supplies | Section 2.5.1 | N/A |
| 10633 | For wastewater and recycled water, coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area. | System Supplies (Recycled Water) | Section 6.5.1 | Section 5.3.1 |
| 10633(a) | Describe the wastewater collection and treatment systems in the supplier's service area. Include quantification of the amount of wastewater collected and treated and the methods of wastewater disposal. | System Supplies (Recycled Water) | Section 6.5.2 | Section 5.3.2 and Table 5-2 |
| 10633(b) | Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project. | System Supplies (Recycled Water) | Section 6.5.2.2 | Section 5.3.2 |
| 10633(c) | Describe the recycled water currently being used in the supplier's service area. | System Supplies (Recycled Water) | Section 6.5.3 and 6.5.4 | Section 5.3.3 |
| 10633(d) | Describe and quantify the potential uses of recycled water and provide a determination of the technical and economic feasibility of those uses. | System Supplies (Recycled Water) | Section 6.5.4 | Section 5.3.5 |
| 10633(e) | Describe the projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected. | System Supplies (Recycled Water) | Section 6.5.4 | Sections 5.3.4 and 5.3.5 |
| 10633(f) | Describe the actions which may be taken to encourage the use of recycled water and the projected results of these actions in terms of acre-feet of recycled water used per year. | System Supplies (Recycled Water) | Section 6.5.5 | Section 5.3.6 |

| CWC Section | UWMP requirement | Subject | Guidebook Location | UWMP Section |
|---|---|---|---|---|
| 10633(g) | Provide a plan for optimizing the use of recycled water in the supplier's service area. | System Supplies (Recycled Water) | Section 6.5.5 | Section 5.3.6 |
| 10620(f) | Describe water management tools and options to maximize resources and minimize the need to import water from other regions. | Water Supply Reliability Assessment | Section 7.4 | Section 6.8 |
| 10631(c)(1) | Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage. | Water Supply Reliability Assessment | Section 7.1 | Section 6 |
| 10631(c)(1) | Provide data for an average water year, a single dry water year, and multiple dry water years | Water Supply Reliability Assessment | Section 7.2 | Section 6.4 and Table 6-1 |
| 10631(c)(2) | For any water source that may not be available at a consistent level of use, describe plans to supplement or replace that source. | Water Supply Reliability Assessment | Section 7.1 | Section 6.8 |
| 10634 | Provide information on the quality of existing sources of water available to the supplier and the manner in which water quality affects water management strategies and supply reliability | Water Supply Reliability Assessment | Section 7.1 | Section 6.6 |
| 10635(a) | Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years. | Water Supply Reliability Assessment | Section 7.3 | Section 6.5 and Tables 6-2 through 6-4 |
| 10632(a) and 10632(a)(1) | Provide an urban water shortage contingency analysis that specifies stages of action and an outline of specific water supply conditions at each stage. | Water Shortage Contingency Planning | Section 8.1 | Section 7 |
| 10632(a)(2) | Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three- year historic sequence for the agency. | Water Shortage Contingency Planning | Section 8.9 | Section 7.13 and Table 7-6 |
| 10632(a)(3) | Identify actions to be undertaken by the urban water supplier in case of a catastrophic interruption of water supplies. | Water Shortage Contingency Planning | Section 8.8 | Section 7.12 |

| CWC Section | UWMP requirement | Subject | Guidebook Location | UWMP Section |
|---|---|---|---|---|
| 10632(a)(4) | Identify mandatory prohibitions against specific water use practices during water shortages. | Water Shortage Contingency Planning | Section 8.2 | Section 7.6 and Table 7-5 |
| 10632(a)(5) | Specify consumption reduction methods in the most restrictive stages. | Water Shortage Contingency Planning | Section 8.4 | Section 7.8 and Table 7-5 |
| 10632(a)(6) | Indicate penalties or charges for excessive use, where applicable. | Water Shortage Contingency Planning | Section 8.3 | Section 7.7 |
| 10632(a)(7) | Provide an analysis of the impacts of each of the actions and conditions in the water shortage contingency analysis on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts. | Water Shortage Contingency Planning | Section 8.6 | Section 7.10 |
| 10632(a)(8) | Provide a draft water shortage contingency resolution or ordinance. | Water Shortage Contingency Planning | Section 8.7 | Section 7.11 and Appendix L |
| 10632(a)(9) | Indicate a mechanism for determining actual reductions in water use pursuant to the water shortage contingency analysis. | Water Shortage Contingency Planning | Section 8.5 | Section 7.9 |
| 10631(f)(1) | Retail suppliers shall provide a description of the nature and extent of each demand management measure implemented over the past five years. The description will address specific measures listed in code. | Demand Management Measures | Sections 9.2 and 9.3 | Section 8 |
| 10631(f)(2) | Wholesale suppliers shall describe specific demand management measures listed in code, their distribution system asset management program, and supplier assistance program. | Demand Management Measures | Sections 9.1 and 9.3 | N/A |

| CWC Section | UWMP requirement | Subject | Guidebook Location | UWMP Section |
|---|---|---|---|---|
| 10631(j) | CUWCC members may submit their 2013- 2014 CUWCC BMP annual reports in lieu of, or in addition to, describing the DMM implementation in their UWMPs. This option is only allowable if the supplier has been found to be in full compliance with the CUWCC MOU. | Demand Management Measures | Section 9.5 | N/A |
| 10608.26(a) | Retail suppliers shall conduct a public hearing to discuss adoption, implementation, and economic impact of water use targets. | Plan Adoption, Submittal, and Implementation | Section 10.3 | Section 9.3 and Appendix L |
| 10621(b) | Notify, at least 60 days prior to the public hearing, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. | Plan Adoption, Submittal, and Implementation | Section 10.2.1 | Section 9.1, Table 1-1, and Appendix B |
| 10621(d) | Each urban water supplier shall update and submit its 2015 plan to the department by July 1, 2016. | Plan Adoption, Submittal, and Implementation | Sections 10.3.1 and 10.4 | Appendix M |
| 10635(b) | Provide supporting documentation that Water Shortage Contingency Plan has been, or will be, provided to any city or county within which it provides water, no later than 60 days after the submission of the plan to DWR. | Plan Adoption, Submittal, and Implementation | Section 10.4.4 | Appendix M |
| 10642 | Provide supporting documentation that the urban water supplier made the plan available for public inspection, published notice of the public hearing, and held a public hearing about the plan. | Plan Adoption, Submittal, and Implementation | Sections 10.2.2, 10.3, and 10.5 | Appendix L |
| 10642 | The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. | Plan Adoption, Submittal, and Implementation | Sections 10.2.1 | Section 9.2 and Appendix C |
| 10642 | Provide supporting documentation that the plan has been adopted as prepared or modified. | Plan Adoption, Submittal, and Implementation | Section 10.3.1 | Appendix L |
| 10644(a) | Provide supporting documentation that the urban water supplier has submitted this UWMP to the California State Library. | Plan Adoption, Submittal, and Implementation | Section 10.4.3 | Appendix N |

| CWC Section | UWMP requirement | Subject | Guidebook Location | UWMP Section |
|---|---|---|---|---|
| 10644(a)(1) | Provide supporting documentation that the urban water supplier has submitted this UWMP to any city or county within which the supplier provides water no later than 30 days after adoption. | Plan Adoption, Submittal, and Implementation | Section 10.4.4 | Appendix M |
| 10644(a)(2) | The plan, or amendments to the plan, submitted to the department shall be submitted electronically. | Plan Adoption, Submittal, and Implementation | Sections 10.4.1 and 10.4.2 | Appendix M |
| 10645 | Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the supplier has or will make the plan available for public review during normal business hours. | Plan Adoption, Submittal, and Implementation | Section 10.5 | Appendix M |

# APPENDIX E:
# DWR POPULATION TOOL OUTPUTS AND SBX7-7 COMPLIANCE TABLES

| **SB X7-7 Table 0: Units of Measure Used in UWMP*** *(select one from the drop down list)* |
| --- |
| Million Gallons |
| **The unit of measure must be consistent with Table 2-3* |
| NOTES: |

| SB X7-7 Table-1: Baseline Period Ranges | | | |
|---|---|---|---|
| **Baseline** | **Parameter** | **Value** | **Units** |
| 10- to 15-year baseline period | 2008 total water deliveries | 1,735 | Million Gallons |
| | 2008 total volume of delivered recycled water | 110 | Million Gallons |
| | 2008 recycled water as a percent of total deliveries | 6.31% | Percent |
| | Number of years in baseline period[1] | 10 | Years |
| | Year beginning baseline period range | 1996 | |
| | Year ending baseline period range[2] | 2005 | |
| 5-year baseline period | Number of years in baseline period | 5 | Years |
| | Year beginning baseline period range | 2003 | |
| | Year ending baseline period range[3] | 2007 | |

[1] *If the 2008 recycled water percent is less than 10 percent, then the first baseline period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first baseline period is a continuous 10- to 15-year period.*

[2] *The ending year must be between December 31, 2004 and December 31, 2010.*

[3] *The ending year must be between December 31, 2007 and December 31, 2010.*

NOTES:

| SB X7-7 Table 2: Method for Population Estimates | |
|---|---|
| **Method Used to Determine Population**<br>(may check more than one) | |
| ☐ | **1. Department of Finance** (DOF)<br>DOF Table E-8 (1990 - 2000) and (2000-2010) and<br>DOF Table E-5 (2011 - 2015) when available |
| ☐ | **2. Persons-per-Connection Method** |
| ☑ | **3. DWR Population Tool** |
| ☐ | **4. Other**<br>DWR recommends pre-review |
| NOTES: | |

| SB X7-7 Table 3: Service Area Population | | |
|---|---|---|
| Year | | Population |
| 10 to 15 Year Baseline Population | | |
| Year 1 | 1996 | 28,214 |
| Year 2 | 1997 | 28,379 |
| Year 3 | 1998 | 28,544 |
| Year 4 | 1999 | 28,711 |
| Year 5 | 2000 | 28,900 |
| Year 6 | 2001 | 28,032 |
| Year 7 | 2002 | 26,868 |
| Year 8 | 2003 | 27,187 |
| Year 9 | 2004 | 27,521 |
| Year 10 | 2005 | 27,881 |
| *Year 11* | | |
| *Year 12* | | |
| *Year 13* | | |
| *Year 14* | | |
| *Year 15* | | |
| 5 Year Baseline Population | | |
| Year 1 | 2003 | 27,187 |
| Year 2 | 2004 | 27,521 |
| Year 3 | 2005 | 27,881 |
| Year 4 | 2006 | 28,187 |
| Year 5 | 2007 | 28,525 |
| 2015 Compliance Year Population | | |
| **2015** | | 31,109 |
| NOTES: | | |

| SB X7-7 Table 4: Annual Gross Water Use * | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | **Baseline Year** *Fm SB X7-7 Table 3* | **Volume Into Distribution System** *Fm SB X7-7 Table(s) 4-A* | **Deductions** | | | | | **Annual Gross Water Use** |
| | | | Exported Water | Change in Dist. System Storage (+/-) | Indirect Recycled Water *Fm SB X7-7 Table 4-B* | Water Delivered for Agricultural Use | Process Water *Fm SB X7-7 Table(s) 4-D* | |
| 10 to 15 Year Baseline - Gross Water Use | | | | | | | | |
| Year 1 | 1996 | 1719.15 | 0 | 0 | 0 | 0 | 0 | 1,719 |
| Year 2 | 1997 | 1759.3 | 0 | 0 | 0 | 0 | 0 | 1,759 |
| Year 3 | 1998 | 1668.05 | 0 | 0 | 0 | 0 | 0 | 1,668 |
| Year 4 | 1999 | 1697.25 | 0 | 0 | 0 | 0 | 0 | 1,697 |
| Year 5 | 2000 | 1781.2 | 0 | 0 | 0 | 0 | 0 | 1,781 |
| Year 6 | 2001 | 1781.2 | 0 | 0 | 0 | 0 | 0 | 1,781 |
| Year 7 | 2002 | 1693.6 | 0 | 0 | 0 | 0 | 0 | 1,694 |
| Year 8 | 2003 | 1730.1 | 0 | 0 | 0 | 0 | 0 | 1,730 |
| Year 9 | 2004 | 1748.35 | 0 | 0 | 0 | 0 | 0 | 1,748 |
| Year 10 | 2005 | 1649.8 | 0 | 0 | 0 | 0 | 0 | 1,650 |
| *Year 11* | 0 | 0 | | | 0 | | 0 | 0 |
| *Year 12* | 0 | 0 | | | 0 | | 0 | 0 |
| *Year 13* | 0 | 0 | | | 0 | | 0 | 0 |
| *Year 14* | 0 | 0 | | | 0 | | 0 | 0 |
| *Year 15* | 0 | 0 | | | 0 | | 0 | 0 |
| **10 - 15 year baseline average gross water use** | | | | | | | | **1,149** |
| 5 Year Baseline - Gross Water Use | | | | | | | | |
| Year 1 | 2003 | 1,730 | 0 | 0 | 0 | 0 | 0 | 1,730 |
| Year 2 | 2004 | 1,748 | 0 | 0 | 0 | 0 | 0 | 1,748 |
| Year 3 | 2005 | 1,650 | 0 | 0 | 0 | 0 | 0 | 1,650 |
| Year 4 | 2006 | 1,588 | 0 | 0 | 0 | 0 | 0 | 1,588 |
| Year 5 | 2007 | 1,653 | 0 | 0 | 0 | 0 | 0 | 1,653 |
| **5 year baseline average gross water use** | | | | | | | | **1,674** |
| 2015 Compliance Year - Gross Water Use | | | | | | | | |
| **2015** | | 1,283 | 0 | 0 | 0 | 0 | 0 | 1,283 |

* NOTE that the units of measure must remain consistent throughout the UWMP, as reported in Table 2-3

NOTES:

**SB X7-7 Table 4-A: Volume Entering the Distribution System(s)**

Complete one table for each source.

| **Name of Source** | SFPUC RWS |
|---|---|
| **This water source is:** | |
| ☐ | The supplier's own water source |
| ☑ | A purchased or imported source |

| **Baseline Year** *Fm SB X7-7 Table 3* | | Volume Entering Distribution System | Meter Error Adjustment* *Optional (+/-)* | Corrected Volume Entering Distribution System |
|---|---|---|---|---|
| 10 to 15 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 1996 | 1,719 | 0 | 1,719 |
| Year 2 | 1997 | 1,759 | 0 | 1,759 |
| Year 3 | 1998 | 1,668 | 0 | 1,668 |
| Year 4 | 1999 | 1,697 | 0 | 1,697 |
| Year 5 | 2000 | 1,781 | 0 | 1,781 |
| Year 6 | 2001 | 1,781 | 0 | 1,781 |
| Year 7 | 2002 | 1,694 | 0 | 1,694 |
| Year 8 | 2003 | 1,730 | 0 | 1,730 |
| Year 9 | 2004 | 1,748 | 0 | 1,748 |
| Year 10 | 2005 | 1,650 | 0 | 1,650 |
| Year 11 | 0 | | | 0 |
| Year 12 | 0 | | | 0 |
| Year 13 | 0 | | | 0 |
| Year 14 | 0 | | | 0 |
| Year 15 | 0 | | | 0 |
| 5 Year Baseline - Water into Distribution System | | | | |
| Year 1 | 2003 | 1,730 | 0 | 1,730 |
| Year 2 | 2004 | 1,748 | 0 | 1,748 |
| Year 3 | 2005 | 1,650 | 0 | 1,650 |
| Year 4 | 2006 | 1,588 | 0 | 1,588 |
| Year 5 | 2007 | 1,653 | 0 | 1,653 |
| 2015 Compliance Year - Water into Distribution System | | | | |
| **2015** | | 1283.27217 | 0 | 1,283 |

** Meter Error Adjustment - See guidance in Methodology 1, Step 3 of Methodologies Document*

NOTES:

**SB X7-7 Table 4-B: Indirect Recycled Water Use Deduction** *(For use only by agencies that are deducting indirect recycled water)*

| **Baseline Year** *Fm SB X7-7 Table 3* | | Surface Reservoir Augmentation | | | | | Groundwater Recharge | | | **Total Deductible Volume of Indirect Recycled Water Entering the Distribution System** |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Volume Discharged from Reservoir for Distribution System Delivery | Percent Recycled Water | Recycled Water Delivered to Treatment Plant | Transmission/ Treatment Loss | Recycled Volume Entering Distribution System from Surface Reservoir Augmentation | Recycled Water Pumped by Utility* | Transmission/ Treatment Losses | Recycled Volume Entering Distribution System from Groundwater Recharge | |
| 10-15 Year Baseline - Indirect Recycled Water Use | | | | | | | | | | |
| Year 1 | 1996 | | | 0 | | 0 | | | 0 | 0 |
| Year 2 | 1997 | | | 0 | | 0 | | | 0 | 0 |
| Year 3 | 1998 | | | 0 | | 0 | | | 0 | 0 |
| Year 4 | 1999 | | | 0 | | 0 | | | 0 | 0 |
| Year 5 | 2000 | | | 0 | | 0 | | | 0 | 0 |
| Year 6 | 2001 | | | 0 | | 0 | | | 0 | 0 |
| Year 7 | 2002 | | | 0 | | 0 | | | 0 | 0 |
| Year 8 | 2003 | | | 0 | | 0 | | | 0 | 0 |
| Year 9 | 2004 | | | 0 | | 0 | | | 0 | 0 |
| Year 10 | 2005 | | | 0 | | 0 | | | 0 | 0 |
| *Year 11* | 0 | | | 0 | | 0 | | | 0 | 0 |
| *Year 12* | 0 | | | 0 | | 0 | | | 0 | 0 |
| *Year 13* | 0 | | | 0 | | 0 | | | 0 | 0 |
| *Year 14* | 0 | | | 0 | | 0 | | | 0 | 0 |
| *Year 15* | 0 | | | 0 | | 0 | | | 0 | 0 |
| 5 Year Baseline - Indirect Recycled Water Use | | | | | | | | | | |
| Year 1 | 2003 | | | 0 | | 0 | | | 0 | 0 |
| Year 2 | 2004 | | | 0 | | 0 | | | 0 | 0 |
| Year 3 | 2005 | | | 0 | | 0 | | | 0 | 0 |
| Year 4 | 2006 | | | 0 | | 0 | | | 0 | 0 |
| Year 5 | 2007 | | | 0 | | 0 | | | 0 | 0 |
| 2015 Compliance - Indirect Recycled Water Use | | | | | | | | | | |
| **2015** | | | | 0 | | 0 | | | 0 | 0 |

**Suppliers will provide supplemental sheets to document the calculation for their input into "Recycled Water Pumped by Utility". The volume reported in this cell must be less than total groundwater pumped - See Methodology 1, Step 8, section 2.c.*

NOTES:

| SB X7-7 Table 5: Gallons Per Capita Per Day (GPCD) | | | | |
|---|---|---|---|---|
| **Baseline Year** *Fm SB X7-7 Table 3* | | Service Area Population *Fm SB X7-7 Table 3* | Annual Gross Water Use *Fm SB X7-7 Table 4* | Daily Per Capita Water Use (GPCD) |
| 10 to 15 Year Baseline GPCD | | | | |
| Year 1 | 1996 | 28,214 | 1,719 | 167 |
| Year 2 | 1997 | 28,379 | 1,759 | 170 |
| Year 3 | 1998 | 28,544 | 1,668 | 160 |
| Year 4 | 1999 | 28,711 | 1,697 | 162 |
| Year 5 | 2000 | 28,900 | 1,781 | 169 |
| Year 6 | 2001 | 28,032 | 1,781 | 174 |
| Year 7 | 2002 | 26,868 | 1,694 | 173 |
| Year 8 | 2003 | 27,187 | 1,730 | 174 |
| Year 9 | 2004 | 27,521 | 1,748 | 174 |
| Year 10 | 2005 | 27,881 | 1,650 | 162 |
| *Year 11* | 0 | 0 | 0 | |
| *Year 12* | 0 | 0 | 0 | |
| *Year 13* | 0 | 0 | 0 | |
| *Year 14* | 0 | 0 | 0 | |
| *Year 15* | 0 | 0 | 0 | |
| **10-15 Year Average Baseline GPCD** | | | | **169** |
| 5 Year Baseline GPCD | | | | |
| **Baseline Year** *Fm SB X7-7 Table 3* | | Service Area Population *Fm SB X7-7 Table 3* | Gross Water Use *Fm SB X7-7 Table 4* | Daily Per Capita Water Use |
| Year 1 | 2003 | 27,187 | 1,730 | 174 |
| Year 2 | 2004 | 27,521 | 1,748 | 174 |
| Year 3 | 2005 | 27,881 | 1,650 | 162 |
| Year 4 | 2006 | 28,187 | 1,588 | 154 |
| Year 5 | 2007 | 28,525 | 1,653 | 159 |
| **5 Year Average Baseline GPCD** | | | | **165** |
| 2015 Compliance Year GPCD | | | | |
| **2015** | | 31,109 | 1,283 | 113 |
| NOTES: | | | | |

| **SB X7-7 Table 6**: Gallons per Capita per Day<br>*Summary From Table SB X7-7 Table 5* | |
|---|---|
| 10-15 Year Baseline GPCD | 169 |
| 5 Year Baseline GPCD | 165 |
| 2015 Compliance Year GPCD | 113 |
| NOTES: | |

| **SB X7-7 Table 7: 2020 Target Method**<br>*Select Only One* | | |
|---|---|---|
| Target Method | | Supporting Documentation |
| ☑ | Method 1 | SB X7-7 Table 7A |
| ☐ | Method 2 | SB X7-7 Tables 7B, 7C, and 7D<br>*Contact DWR for these tables* |
| ☐ | Method 3 | SB X7-7 Table 7-E |
| ☐ | Method 4 | Method 4 Calculator |
| NOTES: | | |

| **SB X7-7 Table 7-A: Target Method 1**<br>20% Reduction | |
|---|---|
| 10-15 Year Baseline GPCD | 2020 Target GPCD |
| 169 | 135 |
| NOTES: | |

| SB X7-7 Table 7-E: Target Method 3 | | | | |
|---|---|---|---|---|
| Agency May Select More Than One as Applicable | Percentage of Service Area in This Hydrological Region | Hydrologic Region | "2020 Plan" Regional Targets | Method 3 Regional Targets (95%) |
| ☐ | | North Coast | 137 | 130 |
| ☐ | | North Lahontan | 173 | 164 |
| ☐ | | Sacramento River | 176 | 167 |
| ☐ | | San Francisco Bay | 131 | 124 |
| ☐ | | San Joaquin River | 174 | 165 |
| ☐ | | Central Coast | 123 | 117 |
| ☐ | | Tulare Lake | 188 | 179 |
| ☐ | | South Lahontan | 170 | 162 |
| ☐ | | South Coast | 149 | 142 |
| ☐ | | Colorado River | 211 | 200 |
| **Target** *(If more than one region is selected, this value is calculated.)* | | | | **0** |
| NOTES: | | | | |

| SB X7-7 Table 7-F: Confirm Minimum Reduction for 2020 Target | | | |
|---|---|---|---|
| 5 Year Baseline GPCD *From SB X7-7 Table 5* | Maximum 2020 Target* | Calculated 2020 Target *Fm Appropriate Target Table* | Confirmed 2020 Target |
| 165 | 156 | 135 | 135 |
| ** Maximum 2020 Target is 95% of the 5 Year Baseline GPCD* | | | |
| NOTES: | | | |

| SB X7-7 Table 8: 2015 Interim Target GPCD | | |
|---|---|---|
| Confirmed 2020 Target *Fm SB X7-7 Table 7-F* | 10-15 year Baseline GPCD *Fm SB X7-7 Table 5* | 2015 Interim Target GPCD |
| 135 | 169 | 152 |
| NOTES: | | |

| SB X7-7 Table 9: 2015 Compliance | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Actual 2015 GPCD | 2015 Interim Target GPCD | Optional Adjustments *(in GPCD)* | | | | | 2015 GPCD *(Adjusted if applicable)* | Did Supplier Achieve Targeted Reduction for 2015? |
| | | Extraordinary Events | Weather Normalization | Economic Adjustment | TOTAL Adjustments | Adjusted 2015 GPCD | | |
| 113 | 152 | *From Methodology 8 (Optional)* | *From Methodology 8 (Optional)* | *From Methodology 8 (Optional)* | 0 | 113.0159815 | 113.0159815 | YES |
| NOTES: | | | | | | | | |

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## Confirmation Information

| Generated By | Water Supplier Name | Confirmation # | Generated On |
|---|---|---|---|
| Daniel Gold | Burlingame City Of | 5186719596 | 3/10/2016 12:30:01 PM |

## Boundary Information

| Census Year | Boundary Filename | Internal Boundary ID |
|---|---|---|
| 1990 | Landuse_Dissolve.kml | 652 |
| 2000 | Landuse_Dissolve.kml | 652 |
| 2010 | Landuse_Dissolve.kml | 652 |

## Baseline Period Ranges

### 10 to 15-year baseline period

Number of years in baseline period: 10

Year beginning baseline period range: 1995

Year ending baseline period range[1]: 2004

### 5-year baseline period

Year beginning baseline period range: 2003

Year ending baseline period range[2]: 2007

[1] The ending year must be between December 31, 2004 and December 31, 2010.

[2] The ending year must be between December 31, 2007 and December 31, 2010.

## Persons-Per-SF Connection and Persons-Per-MF/GQ Connection

| | Census Block Group Level | | | Census Block Level | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Year | Population in SF Housing | Total Population | % Population in SF Housing | Service Area Population | Population in SF Housing (calculated) | Population in MF/GQ Housing (calculated) | # SF Connections | # MF/GQ Connections | Persons per SF Connection | Persons per MF/GQ Connection |
| 1990 | 16,852 | 27,320 | 61.68% | 27,204 | 16,780 | 10,424 | 6343 | 1158 | 2.65 | 9.00 |
| 1991 | - | - | - | - | - | - | - | - | 2.67 | 9.03 |
| 1992 | - | - | - | - | - | - | - | - | 2.69 | 9.07 |
| 1993 | - | - | - | - | - | - | - | - | 2.71 | 9.10 |
| 1994 | - | - | - | - | - | - | - | - | 2.73 | 9.13 |
| 1995 | - | - | - | - | - | - | - | - | 2.75 | 9.16 |
| 1996 | - | - | - | - | - | - | - | - | 2.76 | 9.20 |
| 1997 | - | - | - | - | - | - | - | - | 2.78 | 9.23 |
| 1998 | - | - | - | - | - | - | - | - | 2.80 | 9.26 |
| 1999 | - | - | - | - | - | - | - | - | 2.82 | 9.30 |
| 2000 | 16,734 | 26,747 | 62.56% | 28,900 | 18,081 | 10,819 | 6377 | 1159 | 2.84 | 9.33 |
| 2001 | - | - | - | - | - | - | - | - | 2.84 | 9.80 |
| 2002 | - | - | - | - | - | - | - | - | 2.83 | 10.26 |
| 2003 | - | - | - | - | - | - | - | - | 2.83 | 10.73 |
| 2004 | - | - | - | - | - | - | - | - | 2.82 | 11.19 |
| 2005 | - | - | - | - | - | - | - | - | 2.82 | 11.66 |
| 2006 | - | - | - | - | - | - | - | - | 2.82 | 12.13 |
| 2007 | - | - | - | - | - | - | - | - | 2.81 | 12.59 |
| 2008 | - | - | - | - | - | - | - | - | 2.81 | 13.06 |
| 2009 | - | - | - | - | - | - | - | - | 2.80 | 13.52 |
| 2010 | 17,921 | 27,596 | 64.94% | 29,450 | 19,125 | 10,325 | 6826 | 738 | 2.80 | 13.99 |
| 2015 | - | - | - | - | - | - | - | - | 2.78 * | 16.32 * |

## Population Using Persons-Per-SF Connection and Persons-Per-MF/GQ Connection

| Year | | # SF Connections | # MF/GQ Connections | Persons per SF Connection | Persons per MF/GQ Connection | SF Population | MF/GQ Population | Total Population |
|---|---|---|---|---|---|---|---|---|
| **10 to 15 Year Baseline Population Calculations** | | | | | | | | |
| Year 1 | 1995 | 6366 | 1153 | 2.75 | 9.16 | 17,475 | 10,567 | 28,042 |
| Year 2 | 1996 | 6364 | 1155 | 2.76 | 9.20 | 17,590 | 10,624 | 28,214 |
| Year 3 | 1997 | 6363 | 1156 | 2.78 | 9.23 | 17,708 | 10,671 | 28,379 |
| Year 4 | 1998 | 6365 | 1156 | 2.80 | 9.26 | 17,835 | 10,709 | 28,544 |
| Year 5 | 1999 | 6371 | 1155 | 2.82 | 9.30 | 17,973 | 10,738 | 28,711 |
| Year 6 | 2000 | 6377 | 1159 | 2.84 | 9.33 | 18,081 | 10,819 | 28,900 |
| Year 7 | 2001 | 6596 | 952 | 2.84 | 9.80 | 18,706 | 9,326 | 28,032 |
| Year 8 | 2002 | 6813 | 738 | 2.83 | 10.26 | 19,294 | 7,573 | 26,868 |
| Year 9 | 2003 | 6814 | 738 | 2.83 | 10.73 | 19,270 | 7,917 | 27,187 |
| Year 10 | 2004 | 6820 | 738 | 2.82 | 11.19 | 19,260 | 8,261 | 27,521 |
| **5 Year Baseline Population Calculations** | | | | | | | | |
| Year 1 | 2003 | 6814 | 738 | 2.83 | 10.73 | 19,270 | 7,917 | 27,187 |
| Year 2 | 2004 | 6820 | 738 | 2.82 | 11.19 | 19,260 | 8,261 | 27,521 |
| Year 3 | 2005 | 6827 | 740 | 2.82 | 11.66 | 19,252 | 8,628 | 27,881 |
| Year 4 | 2006 | 6823 | 740 | 2.82 | 12.13 | 19,214 | 8,973 | 28,187 |
| Year 5 | 2007 | 6817 | 743 | 2.81 | 12.59 | 19,169 | 9,356 | 28,525 |
| **2015 Compliance Year Population Calculations** | | | | | | | | |
| 2015 | | 6837 | 740 | 2.78 * | 16.32 * | 19,031 | 12,078 | 31,109 |

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# APPENDIX F:
# SOUTH WESTSIDE BASIN GROUNDWATER MANAGEMENT PLAN

# South Westside Basin Groundwater Management Plan

July 2012

# South Westside Basin
# Groundwater Management Plan

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# ACRONYMS AND ABBREVIATIONS

| | |
|---|---|
| 1999 Plan | proposed Westside Basin AB 3030 Groundwater Management Plan |
| AB | Assembly Bill |
| Advisory Committee | South Westside Basin GWMP Advisory Committee |
| AF | acre-feet |
| AFY | acre-feet per year |
| Basin Plan | San Francisco Bay Basin Water Quality Control Plan |
| BMO | Basin Management Objective |
| CalWater | California Water Service Company |
| cfs | cubic feet per second |
| DPH | California Department of Public Health |
| DTSC | California Department of Toxic Substances Control |
| DWR | California Department of Water Resources |
| EPA | U.S. Environmental Protection Agency |
| ft | feet |
| GAMA | Groundwater Ambient Monitoring Assessment |
| gpm | gallons per minute |
| GPS | global positioning satellites |
| Groundwater Task Force | South Westside Basin Groundwater Task Force |
| GSR | Regional Groundwater Storage and Recovery Project |
| GWMP | groundwater management plan |
| Groundwater Model | Westside Basin Groundwater Flow Model |
| ILPS | In-Lieu Pilot Study |
| InSAR | interferometric synthetic aperture radar |
| IRWMP | Integrated Regional Water Management Plan |
| JPA | joint powers agreement |
| MCL | maximum contaminant level |

| | |
|---|---|
| mgd | million gallons per day |
| µg/L | micrograms per liter |
| mg/L | milligrams per liter |
| MOU | Memorandum of Understanding |
| N | nitrogen |
| NAWQA | National Ambient Water Quality Assessment |
| NCCWD | North Coast County Water District |
| NPDES | National Pollutant Discharge Elimination System |
| NSMCSD | North San Mateo County Sanitation District |
| PCE | Tetrachloroethylene |
| Plan Area | area covered by South Westside Basin Groundwater Management Plan |
| ppm | parts per million |
| psi | pounds per square inch |
| RWQCB | Regional Water Quality Control Board, San Francisco Bay Region |
| SB | Senate Bill |
| SFIA | San Francisco International Airport |
| SFPUC | San Francisco Public Utilities Commission |
| SMCL | secondary maximum contaminant level |
| SVOCs | semi-volatile organic compounds |
| TCE | Trichloroethylene |
| TDS | total dissolved solids |
| USGS | United States Geological Survey |
| USDA-NRCS | United States Department of Agriculture Natural Resources Conservation Service |
| Water Board | California State Water Resources Control Board |
| Westside Basin | Westside Groundwater Subbasin |
| Wholesale Water Supply Agreement | Water Supply Agreement between The City And County of San Francisco And Wholesale Customers in Alameda County, San Mateo County, And Santa Clara County |

# 1 INTRODUCTION AND BACKGROUND

## 1.1 PURPOSE OF THE GROUNDWATER MANAGEMENT PLAN

The purpose of the South Westside Basin Groundwater Management Plan (GWMP), including development of the plan and the plan document itself, is to provide a framework for regional groundwater management in the South Westside Basin that sustains the beneficial use of the groundwater resource. This includes:

- Informing the public of the importance of groundwater and of the challenges and opportunities presented by groundwater supplies;
- Developing consensus among stakeholders on issues and solutions related to groundwater;
- Building relationships among stakeholders within the basin and between state and federal agencies; and
- Defining actions to ensure the long-term sustainability of groundwater resources in the South Westside Basin.

This GWMP provides recommendations that, when implemented, are intended to maintain or enhance long-term groundwater levels and quality and minimize land subsidence.

The goal of the GWMP is to ensure a sustainable, high-quality, reliable water supply at a fair price for beneficial uses achieved through local groundwater management.

## 1.2 DESCRIPTION OF THE GROUNDWATER BASIN AND PLAN AREA

The South Westside Basin GWMP area (Plan Area) is the portion of the Westside Groundwater Subbasin (Westside Basin), Basin 2-35, as defined by the California Department of Water Resources (DWR), within the boundaries of San Mateo County. The Plan Area is shown in Figure 1.1. Areas within the northern portion of the DWR-defined Westside Basin, in the City and County of San Francisco, are described in the draft *North Westside Basin Groundwater Basin Management Plan* (SFPUC, 2005).

Overlying municipalities, shown in Figure 1.2, include Daly City, Colma, South San Francisco, San Bruno, Millbrae, and Burlingame. Water agencies serving the Plan Area are shown in Figure 1.3 and include Daly City, California Water Service Company (CalWater) – South San Francisco District, San Bruno, Millbrae, and Burlingame. Additionally, the San Francisco Public Utilities Commission (SFPUC) provides retail water service to the Golden Gate National Cemetery in San Bruno and wholesale water to the retail agencies.

# Figure 1.1
## Plan Area

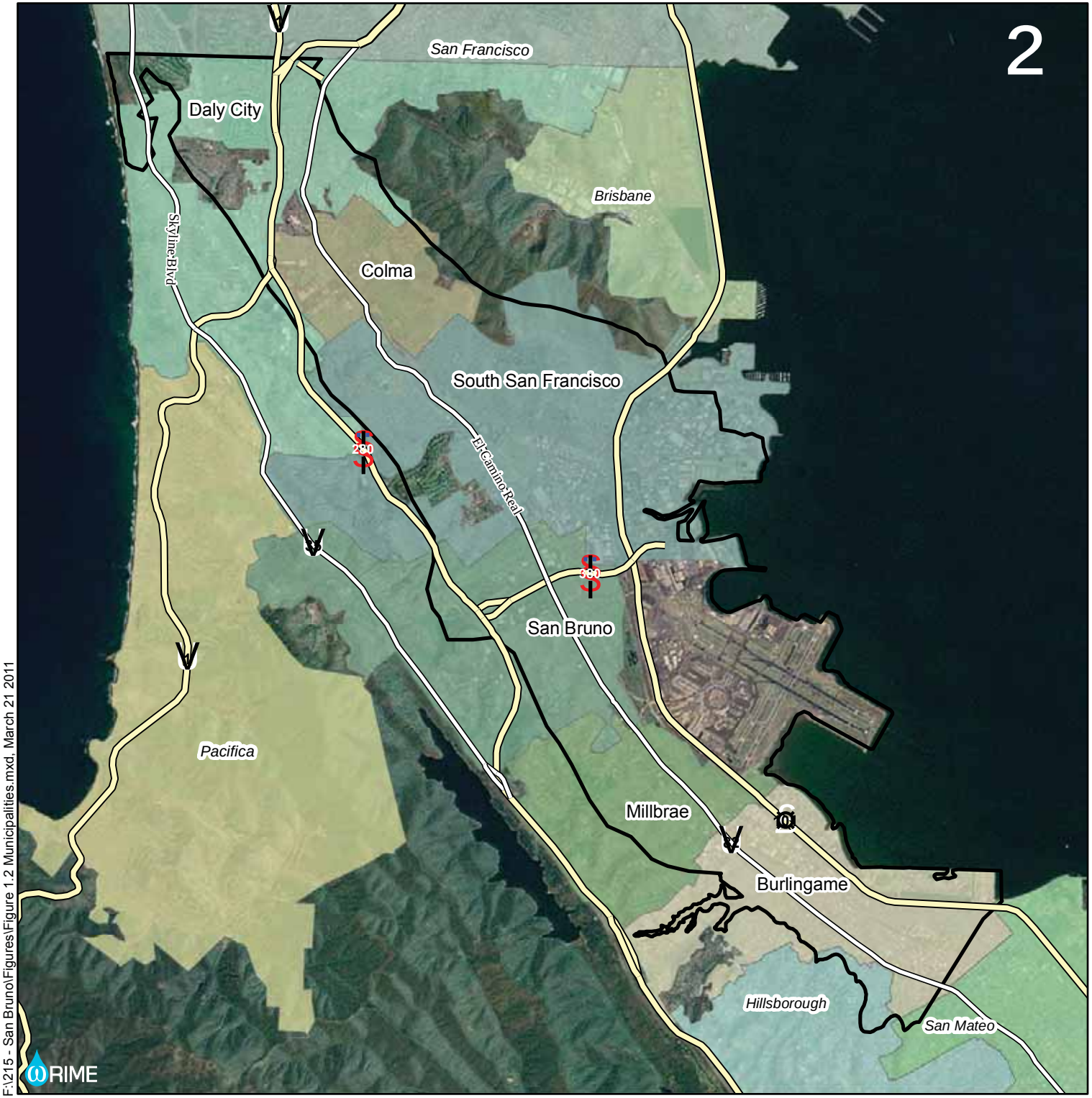
**Legend**

- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

Source: Groundwater Basin: DWR, 2003

F:\215 - San Bruno\Figures\Figure 1.1 Plan Area.mxd, March 21, 2011



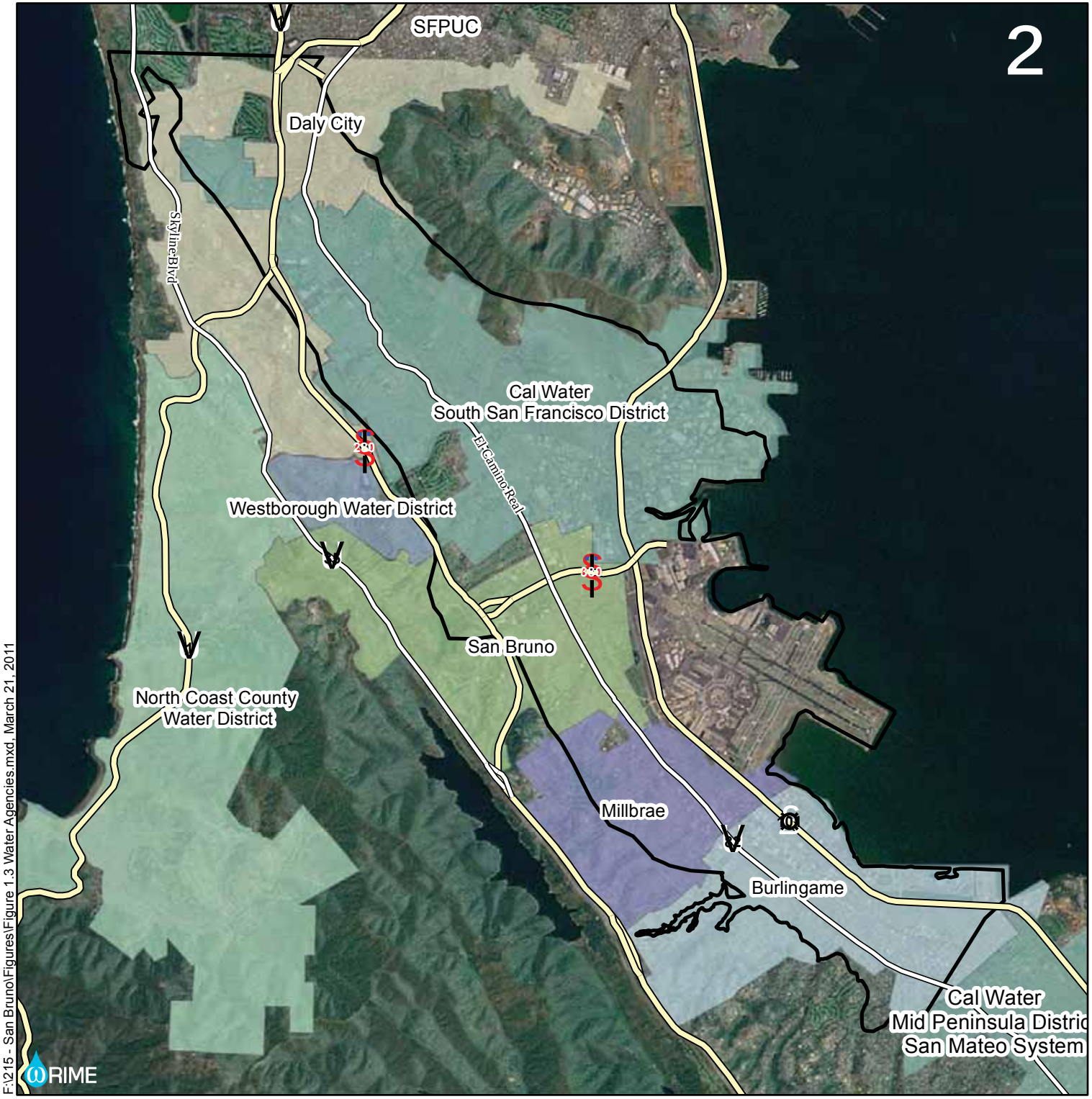

# Figure 1.2
## Municipalities

**Legend**

- Highways
- Plan Area

0 0.5 1 2 Miles

F:\215 - San Bruno\Figures\Figure 1.2 Municipalities.mxd, March 21 2011




# Figure 1.3
## Water Agencies

**Legend**

- Highways
- Plan Area

0 0.5 1 2 Miles

## 1.3 OVERVIEW OF WATER REQUIREMENTS AND SUPPLIES

Located on the San Francisco Peninsula, the South Westside Basin underlies approximately 25 square miles and provides groundwater to Colma, Daly City, San Bruno, South San Francisco, unincorporated areas, cemeteries, golf courses, and several smaller users.

The Plan Area is considered built-out, with very little undeveloped land available for development. Future growth will occur through infill, including increased density on existing developed parcels. Land use in the basin is approximately 80 percent urban; 15 percent irrigated parks, golf courses, and cemeteries; and 5 percent unirrigated open space, as shown in Figures 1.4a and 1.4b. Urban areas include large portions of the cities of Daly City, Colma, South San Francisco, San Bruno, Millbrae, and Burlingame, as well as urbanized unincorporated areas. The total 2010 water demand for the area was approximately 29,000 acre-feet (AF) (Bay Area Water Supply & Conservation Agency [BAWSCA] 2011; SFPUC, 2011).

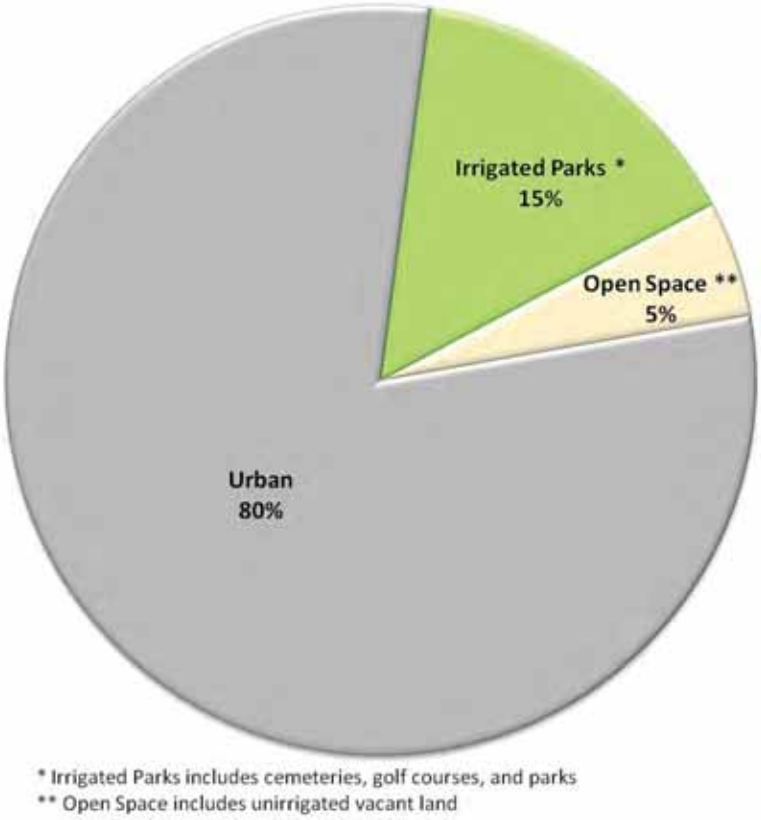
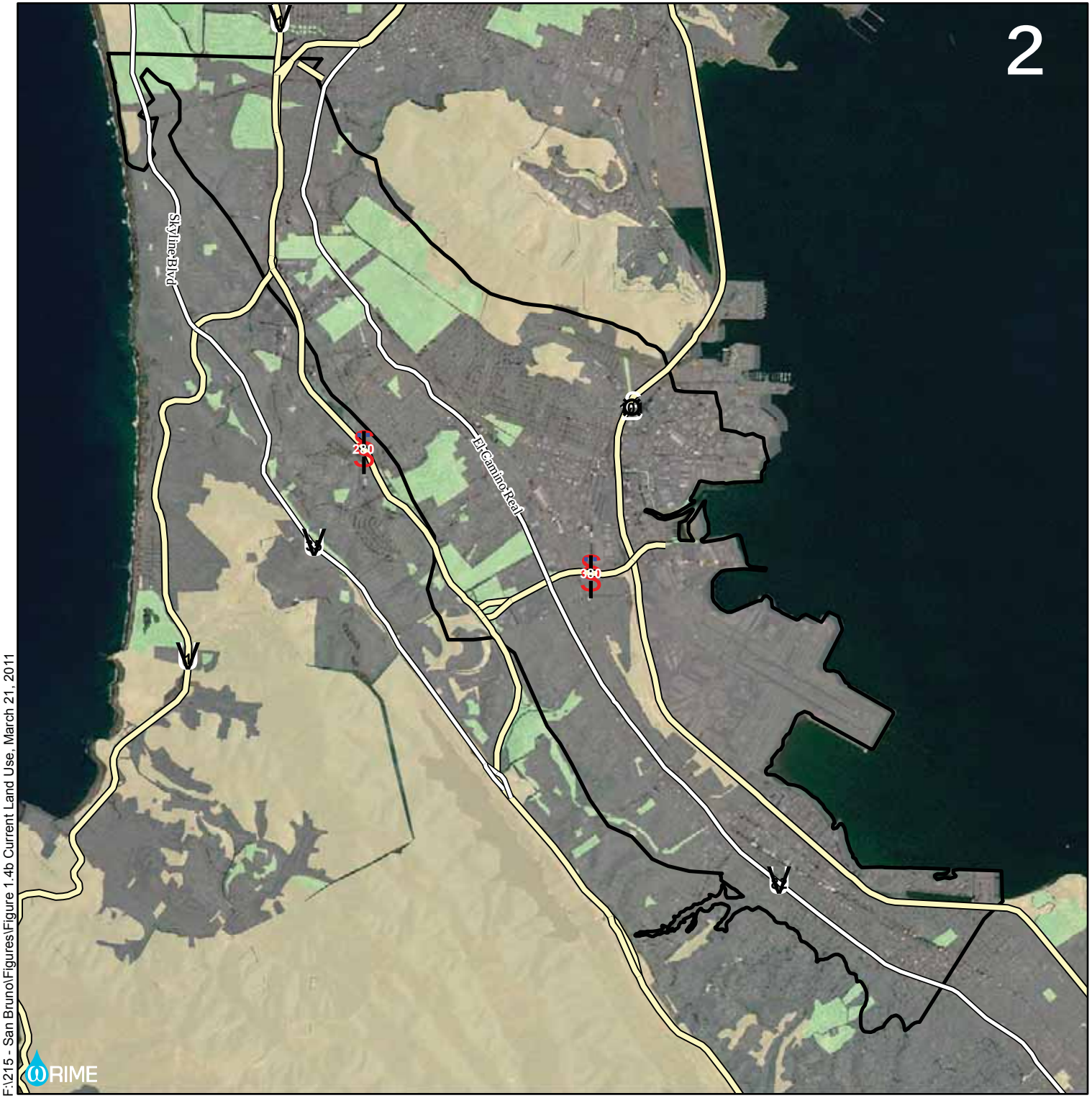



**Figure1.4a Current Land Use Summary**




# Figure 1.4b
## Current Land Use

**Legend**

- Highways
- Plan Area

**Planned Land Use**

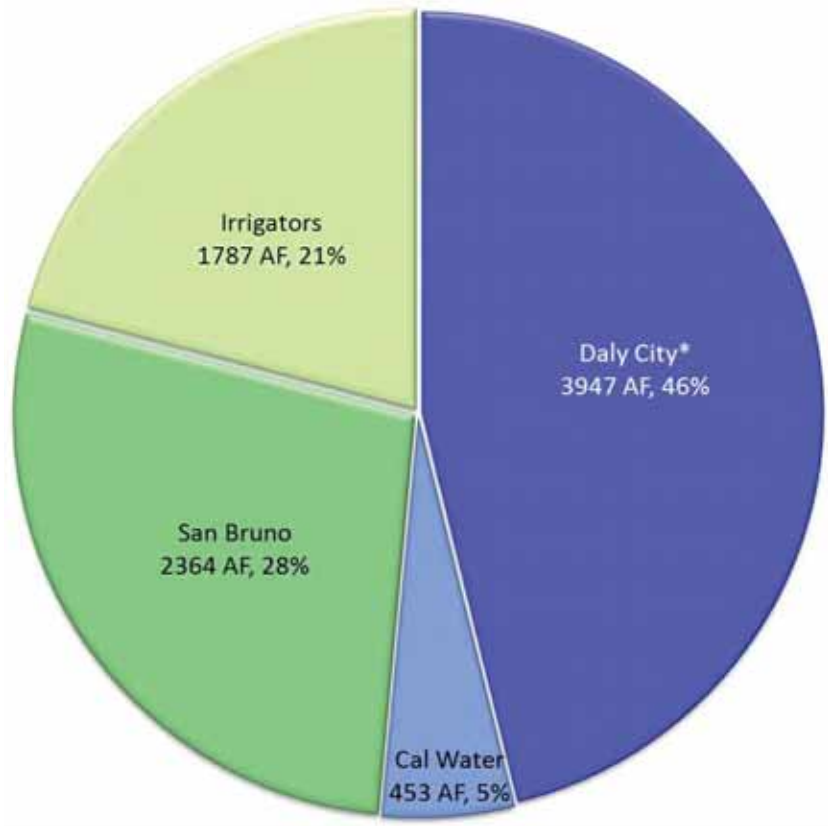
- Urban
- Parks, Cemeteries, Golf Courses
- Open or Vacant Land

0 0.5 1 2 Miles

Source: Land Use - Based on ABAG, 2006

F:\215 - San Bruno\Figures\Figure 1.4b Current Land Use, March 21, 2011

In the South Westside Basin, groundwater plays a critical role, providing up to 50 percent of some localities' water supplies, making it an important resource for the future prosperity and sustainability of the region. Approximately 8,600 AF of groundwater was produced from the South Westside Basin in 2010 (SFPUC, 2011) including 2,200 AF of groundwater banked through in-lieu recharge under the In-Lieu Pilot Study (see Section 1.5.3). Figure 1.5 shows the breakdown of groundwater production by producer for 2010. Imported water from SFPUC's Hetch Hetchy system, along with small quantities of recycled water, provides the remaining supply.




*** Value includes 2,204 AF of banked in-lieu recharge water**

**Figure 1.5 Groundwater Production by Entity, 2010**

While the Plan Area and surrounding region are largely built-out, additional growth through infill is expected, along with associated increases in water demands. As demands for imported water supplies continue to rise, groundwater will continue to play a key role in delivering a cost-effective and reliable water supply to the South Westside Basin.

## 1.4 LEGISLATION RELATED TO GROUNDWATER MANAGEMENT PLANS

Groundwater is a resource shared by numerous users; it does not recognize or adhere to jurisdictional lines and cannot be tagged for use by certain users. Groundwater rights have evolved through case law since the late 1800s. Currently, three basic methods are available for managing groundwater resources in California:

- Local agency management under authority granted by the California Water Code or other applicable state statutes (such as through a GWMP);
- Local government groundwater ordinances or joint powers agreements (JPA); and
- Court adjudications.

No law requires that any of these forms be applied within a basin. As such, management is often instituted after local agencies or landowners recognize specific issues in groundwater conditions. The level of groundwater management in any basin or subbasin is often dependent on water availability and demand, as well as groundwater quality.

In an effort to standardize groundwater management, the California Legislature passed Assembly Bill (AB) 255 (Stats. 1991, Ch. 903) in 1991. This legislation authorized local agencies overlying basins subject to critical overdraft conditions, as defined in DWR's Bulletin 118-80 (DWR, 1980), to establish programs for groundwater management within their service areas. Water Code § 10750 et seq. provided these agencies with the powers of a water replenishment district to raise revenue for facilities to manage the basin for the purposes of extraction, recharge, conveyance, and water quality management. Seven local agencies adopted plans under this authority. The South Westside Basin has never been defined by DWR as being critically overdrafted, as such it was not subject to AB 255.

The provisions of AB 255 were repealed in 1992 with the passage of AB 3030 (Stats. 1992, Ch. 947). This legislation greatly increased the number of local agencies authorized to develop a GWMP and set forth a common management framework for local agencies throughout California. AB 3030, codified in Water Code § 10750 et seq., provides a systematic procedure to develop a groundwater management plan by local agencies overlying the groundwater basins defined by DWR's Bulletin 118 (DWR, 1975) and updates (DWR, 1980, 2003). Upon adoption of a plan, these agencies could possess the same authority as a water replenishment district to "fix and collect fees and assessments for groundwater management" (Water Code, § 10754). However, the authority to fix and collect these fees and assessments is contingent on receiving a majority of votes in favor of the proposal in a local election (Water Code, § 10754.3).

By 2003, more than 200 agencies (shown in Figure 1.6) had adopted an AB 3030 GWMP (DWR, 2003). None of these agencies is known to have exercised the authority of a water replenishment district.

Water Code § 10755.2 expands groundwater management opportunities by encouraging coordinated plans and authorizing public agencies to enter into a JPA or memorandum of understanding (MOU) with public or private entities providing water service. At least 20 coordinated plans have been prepared to date involving nearly 120 agencies, including cities and private water companies.

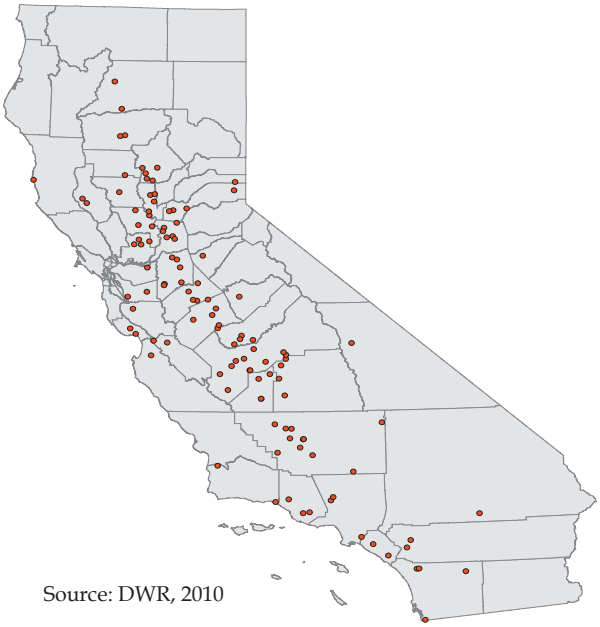



**Figure 1.6. Location of areas with groundwater management plans**

In 2002, the California Legislature passed Senate Bill (SB) 1938 (Stats. 2002, ch. 603), which provides local agencies with incentives for improved groundwater management. While not providing a new vehicle for groundwater management, SB 1938 modified the Water Code by requiring specific elements be included in a GWMP for an agency to be eligible for certain funding administered by DWR for groundwater projects.

Through AB 3030 and SB 1938, local agencies can now develop GWMPs that guide the sustainable use of the groundwater resource while also providing access to certain DWR funding sources.

## 1.5 PRIOR AND CURRENT WATER MANAGEMENT PLANNING EFFORTS

The South Westside Basin has an extensive history of management of groundwater and surface water resources. This document builds upon those efforts, described below.

### 1.5.1 DRAFT WESTSIDE BASIN GROUNDWATER MANAGEMENT PLAN

In 1999, cities and water purveyors overlying much of the Westside Basin (Daly City, CalWater, San Bruno, and SFPUC) cooperatively developed a proposed Westside Basin AB 3030 Groundwater Management Plan (1999 Plan; Bookman-Edmonston, 1999), pursuant to the guidelines in AB 3030. Although not adopted by the cities due to data gaps and other concerns

at the time, the four cities and water purveyors have voluntarily implemented much of the recommendations and other aspects of the 1999 Plan.

The 1999 Plan established a goal of protecting water quality and enhancing water supply reliability in the Westside Basin. This goal was supported by five plan elements:

- **Groundwater Storage and Quality Monitoring –** development of a basin-wide monitoring program
- **Saline Water Intrusion –** use of monitoring data to indicate any occurrence of saltwater intrusion and to provide technical information needed to develop appropriate management responses if intrusion occurs
- **Conjunctive Use –** development of a multi-agency conjunctive use program, including monitoring
- **Recycled Water –** development of a recycled water program for landscape irrigation and other non-potable uses
- **Source Water and Wellhead Protection –** protection of groundwater from contamination from methyl tert-butyl ether (MTBE) and other contaminants through source water assessment methodologies

### 1.5.2 Regional Groundwater Storage and Recovery Project

The proposed Regional Groundwater Storage and Recovery (GSR) Project is designed to balance the use of both groundwater and surface water to increase water supply reliability during dry years or in emergencies. Located in the South Westside Basin, the proposed project is sponsored by SFPUC in coordination with partner agencies: CalWater, Daly City, and San Bruno. The partner agencies currently purchase wholesale surface water from SFPUC and also independently operate groundwater production wells for drinking water and irrigation.

The project would consist of installing up to 16 new recovery well facilities in the South Westside Basin to pump stored groundwater during a drought. During years of normal or above normal precipitation, the proposed project would provide surface water to the partner agencies to reduce the amount of groundwater pumped. The reduced pumping is estimated to result in the storage of approximately 61,000 AF of water in the long-term. This is estimated to allow recovery of stored water at a rate of up to 7.2 million gallons per day (mgd) for a 7.5-year drought period, if the full 61,000 AF is stored prior to the drought period (MWH, 2007). The storage of water in the basin was analyzed through the In-Lieu Pilot Study (ILPS), which is described in the following section.

The GSR Project is in the design and environmental review phases and is envisioned to coordinate management of groundwater supplies through an Operating Committee. The development of the GSR Project includes extensive study of the hydrogeology of the South

Westside Basin and was documented in the Alternatives Analysis Report (MWH, 2007) and in reports documenting monitoring well installation (Kennedy/Jenks, 2009 and 2010).

The parties are working to develop an operating agreement in connection with the proposed GSR Project. To-date, the SFPUC has installed ten multi-level monitoring wells in the South Westside Basin (each consisting of 4 nested monitoring wells). The Proposed Project Draft EIR is scheduled to be circulated in 2012.

### 1.5.3 IN-LIEU PILOT STUDY

Beginning in 2002, SFPUC delivered surface water in-lieu of groundwater through the ILPS to Daly City, San Bruno and CalWater - South San Francisco District. The ILPS demonstrated that SFPUC system water can be stored in the Basin through the delivery of in-lieu water to replace groundwater that Daly City, San Bruno, and CalWater refrained from pumping (Luhdorff & Scalmanini Consulting Engineers [LSCE], 2005).

During the ILPS, significant quantities of water were banked as shown in Figure 1.7 and discussed below:

- **Daly City -** Through May 7, 2007, SFPUC delivered 13,077 AF of in-lieu water to Daly City. Beginning in May 2009, SFPUC resumed delivery of in-lieu water to Daly City, resulting in additional banking of water. In 2009 and 2010, 1,921 AF and 2,204 AF of water was banked by Daly City, respectively.
- **CalWater – South San Francisco District -** Between February 1, 2003 and November 1, 2003, SFPUC delivered 802 AF of in-lieu water to CalWater – South San Francisco District. When the ILPS restarted on April 1, 2004, CalWater did not participate and did not resume pumping, but continued to rely on wholesale water for all of its water needs in its South San Francisco service area. This resulted in an increase in basin water levels as if CalWater had continued to participate in the ILPS, and a corresponding increase in stored water of 930 AF between April 1, 2004 and March 1, 2005.
- **San Bruno –** From January 28, 2003 through March 1, 2005, SFPUC delivered 3,915 AF of in-lieu water to San Bruno.

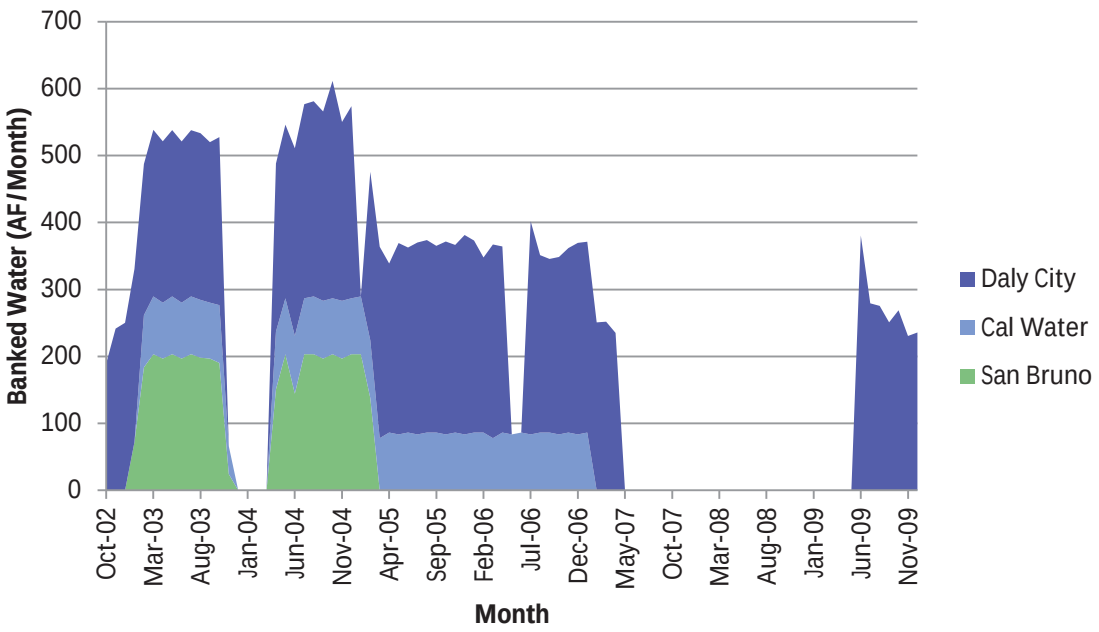



**Figure 1.7 Banked Groundwater in In-Lieu Pilot Study**

### 1.5.4 SAN FRANCISCO BAY BASIN WATER QUALITY CONTROL PLAN

The *San Francisco Bay Basin Water Quality Control Plan* (Basin Plan) (California Regional Water Quality Control Board, San Francisco Bay Region [RWQCB], 2010) was developed by the RWQCB to provide positive and firm direction for future water quality control.

The Basin Plan fulfills the following needs:

- Requirements from the U.S. Environmental Protection Agency (EPA) for such a plan to allocate federal grants to cities and districts for construction of wastewater treatment facilities.
- A basis for establishing priorities for disbursing both state and federal grants for constructing and upgrading wastewater treatment facilities.
- Requirements of the Porter-Cologne Act that call for water quality control plans in California.
- A basis for the RWQCB to establish or revise waste discharge requirements and for the State Water Resources Control Board (Water Board) to establish or revise water rights permits.
- Conditions (discharge prohibitions) that must be met at all times.
- Water quality standards applicable to waters of the Region, as required by the federal Clean Water Act.

- Water quality attainment strategies, including total maximum daily loads required by the Clean Water Act, for pollutants and water bodies where water quality standards are not currently met.

While the Basin Plan has a definite focus on surface water resources, groundwater quality is included as well, particularly through the watershed management approach. This approach includes groundwater as well as surface water bodies (e.g., streams, rivers, lakes, reservoirs, wetlands, and the surrounding landscape) in an effort to develop unique, integrated solutions for individual watersheds through a stakeholder process.

As with surface water, the Basin Plan establishes beneficial uses for groundwater throughout the San Francisco Bay Region. For the South Westside Basin, the Basin Plan identifies two areas: Westside C (2-35C), extending from the San Francisco County line to the City of South San Francisco, and Westside D (2-35D), extending from South San Francisco to the southern extent of the South Westside Basin. The designated beneficial uses for groundwater within these areas, and within areas in the North Westside Basin, are shown in Table 1.1.

**Table 1.1 Basin Plan Beneficial Uses for Groundwater**

| Basin Plan Basin | Location | Beneficial Uses | | | |
|---|---|---|---|---|---|
| | | Municipal and Domestic Water Supply | Industrial Process Water Supply | Industrial Service Water Supply | Agricultural Water Supply |
| **Westside C** | South Westside Basin | Existing | Potential | Potential | Existing |
| **Westside D** | South Westside Basin | Existing | Existing | Existing | Potential |
| **Westside A** | North Westside Basin | Existing | Potential | Potential | Existing |
| **Westside B** | North Westside Basin | Potential | Potential | Potential | Existing |

The Basin Plan sets objectives for groundwater, with maintenance of existing high-quality of groundwater being the primary objective. In addition, at a minimum, groundwater shall not contain concentrations of bacteria, chemical constituents, radioactivity, or substances producing taste and odor in excess of the objectives unless naturally occurring background concentrations

are greater. Under existing law, the Water Board regulates waste discharges to land that could affect water quality, including both groundwater and surface water quality. Waste discharges that reach groundwater are regulated to protect both groundwater and any surface water in continuity with groundwater. Waste discharges that affect groundwater in continuity with surface water cannot cause violations of any applicable surface water standards.

For implementation, the RWQCB focuses on 28 groundwater basins and 7 sub-basins in the Bay Area that serve, or could serve, as sources of high quality drinking water. The Westside Basin is one of these basins. The Basin Plan establishes the following groundwater protection and management goals for the Bay Area region:

- Identify and update beneficial uses and water quality objectives for each groundwater basin.
- Regulate activities that impact or have the potential to impact the beneficial uses of groundwater of the region.
- Prevent future impacts to the groundwater resource through local and regional planning, management, education, and monitoring.

### 1.5.5 San Francisco and Northern San Mateo County Pilot Beneficial Use Designation Project

RWQCB staff, with contributions from local agencies, evaluated existing groundwater protection programs and beneficial uses of groundwater in San Francisco and northern San Mateo County (RWQCB, 1996). Extensive research was conducted and numerous references were compiled to complete the project. The project included the following goals:

- Describe the hydrogeology and groundwater uses for the groundwater basins
- Identify major threats to groundwater and groundwater protection programs
- Identify locations where groundwater is vulnerable to contamination
- Identify locations where groundwater monitoring is needed
- Use GIS to compile complex data sets to use as a decision-making tool for groundwater protection
- Refine beneficial use designations for some groundwater basins
- Identify inactive well locations
- Describe groundwater extraction for municipal, agricultural, and industrial water supply
- Summarize statewide initiatives for groundwater protection and data sharing

- Evaluate special problem areas not typically addressed by groundwater protection programs

The results of the project identified the Westside Basin as a valuable resource deserving of full protection and restoration, including aggressive remediation of contaminated groundwater, enhanced source control and groundwater protection to prevent additional pollution, and groundwater basin management to prevent overdraft.

### 1.5.6 Groundwater Ambient Monitoring and Assessment Program: San Francisco Bay Study Unit

The Groundwater Ambient Monitoring and Assessment (GAMA) program is a comprehensive assessment of statewide groundwater quality implemented by the Water Board in coordination with the U.S. Geological Survey (USGS) and Lawrence Livermore National Laboratory. The program is designed to help better understand and identify risks to groundwater resources. The South Westside Basin was included in the study through the investigation of the San Francisco Bay study unit, which includes portions of San Francisco, San Mateo, Santa Clara, and Alameda Counties, with sampling from April through June 2007.

Groundwater was sampled from 79 wells within the San Francisco Bay study unit to characterize its constituents and identify trends in groundwater quality through a spatially unbiased assessment of raw groundwater quality. Four grid cell wells (SF-03, SF-04, SF-05, and SF-06) and seven understanding wells (SFM-A1, SFM-A2, SFM-A3 SFM-A4, SFM-B1, SFM-B2, and SFU-01) are located in or near the South Westside Basin. The focus on raw water quality rather than treated water quality and the spatially unbiased nature of the program set it apart from other sampling programs that typically use available data from existing wells that are biased toward better water quality and have data intended to meet regulatory requirements for drinking water supplies.

The test results provide information to address a variety of issues ranging in scale from local water supply to statewide resource management. Full analysis of the results will be included in a future USGS report.

### 1.5.7 Bay Area Integrated Regional Water Management Plan

The Bay Area Integrated Regional Water Management Plan (IRWMP) (RMC and Jones & Stokes, 2006) was developed through a Letter of Mutual Understanding by San Francisco Bay Area water, wastewater, flood protection, and stormwater management agencies; cities and counties represented by the Association of Bay Area Governments; and watershed management interests represented by the California Coastal Conservancy and non-governmental environmental organizations. The IRWMP outlines the region's water resource management needs and objectives, and presents innovative strategies and a detailed implementation plan to

achieve these objectives, contributing to sustainable water resources management in the Bay Area.

The following are the overall objectives of the Bay Area IRWMP:

1) Foster coordination, collaboration and communication among Bay Area agencies responsible for water and habitat-related issues.
2) Achieve greater efficiencies and build public support for vital projects.
3) Improve regional competitiveness for project funding.

The Bay Area IRWMP identifies regional priority projects, including two in the South Westside Basin: the Lomita Canal / Cupid Row Canal Upgrades at San Francisco International Airport and SFPUC Groundwater Projects (including Lake Merced Project, Local Groundwater Projects, and the Regional Groundwater Storage and Recovery Project).

The Bay Area IRWMP will be going through an update during 2011 – 2012 to ensure that the IRWMP is in compliance with Proposition 84 requirements, including a climate change impact assessment and integrated flood management.

### 1.5.8 Water Supply Agreement between The City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County

The Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County (Wholesale Water Supply Agreement) (July, 2009) defines the agreement for San Francisco to deliver, up to a defined quantity (Supply Assurance), water to the wholesale customers, including the water agencies in the South Westside Basin. The Supply Assurance includes the wholesale customers as a group, while Individual Supply Guarantees are defined for each agency (Table 1.2). These quantities are expressed in terms of daily deliveries on an annual average basis, although San Francisco agrees to operate the system to meet peak requirements to the extent possible without adversely impacting the ability to meet peak demands of retail customers.

The Wholesale Water Supply Agreement includes details on allocation, service areas, permanent transfers, resale, conservation, other supplies, water quality, maintenance, operation, shortages, wheeling, new customers, metering, the proposed conjunctive use program for the South Westside Basin, implementation of interim supply limitations, wholesale revenues, accounting, and other agreements.

**Table 1.2 Individual Supply Guarantees**

| Wholesale Customer | Individual Supply Guarantee (mgd) | Water Purchases Fiscal Year 2009-2010 (mgd)* |
|---|---|---|
| California Water Services Company | 35.68<br>(includes South San Francisco and areas outside the South Westside Basin) | 32.6<br>(7.2 mgd for South San Francisco District) |
| City of Burlingame | 5.234 | 3.9 |
| City of Daly City | 4.292 | 3.2** |
| City of Millbrae | 3.152 | 2.2 |
| City of San Bruno | 3.246 | 1.5 |
| Town of Hillsborough | 4.090 | 3.0 |

* BAWSCA, 2011

** Amount shown does not include 1.9 mgd of in-lieu water purchases

### 1.5.9 URBAN WATER MANAGEMENT PLANS

Urban water management plans (UWMP) include descriptions and evaluations of historical, current, and future sources of water supply; efficient uses of water; demand management measures; implementation strategies and schedules; and other information as required by the Urban Water Management Planning Act. They are important components for the planning process of each agency and values from these plans are used extensively in Section 3, Water Requirements and Supplies, of this GWMP.

A UWMP is required for water agencies with more than 3,000 customers or that provide over 3,000 AF of water annually. Within the South Westside Basin, UWMPs have been developed and adopted by Burlingame, Daly City, Hillsborough, Millbrae, San Bruno, and CalWater. In the North Westside Basin, SFPUC has developed a UWMP.

## 1.6 PUBLIC PROCESS IN DEVELOPING THE GROUNDWATER MANAGEMENT PLAN

The development of any GWMP is a collaborative process involving all interested stakeholders. Public input is critical to the success of the South Westside Basin GWMP and was a key component of its development.

The public was informed and encouraged to provide input and participate in the development of the GWMP in the following ways:

- GWMP web site: **www.southwestsideplan.com** provided information to the public regarding the GWMP. Details about groundwater management in general and specific to the South Westside Basin were provided. Meeting dates, locations, and materials were posted along with details of the South Westside Basin GWMP Advisory Committee (Advisory Committee) and contact information.
- Newspaper advertisements in the San Mateo County Times gave notice of public hearings.
- Public hearings provided opportunities for personal communications captured in the public record on specific topics, including resolution of intent to draft a GWMP and resolution of adoption of the GWMP.
- Public meetings provided details on the GWMP process and solicited input.
- Advisory Committee meetings provided detailed technical information on the GWMP and solicited input.
- Direct communication by telephone, email, and mail was encouraged at meetings and on the web site. Comments could be sent to the City of San Bruno project manager, local water agency staff, or the consultant project manager.

### 1.6.1 JUNE 2009 PRESENTATION TO IRRIGATION PUMPERS IN THE SOUTH WESTSIDE BASIN

A presentation on the South Westside Basin GWMP was given on June 25, 2009 to cemetery and golf course interests as part of a SFPUC meeting on the proposed GSR and its potential impacts and benefits for cemeteries and golf courses. The meeting was held at 10:30 a.m. at the Colma Town Hall. The presentation gave an overview of groundwater planning, the proposed GWMP, and the process of developing the GWMP. Attendees were invited to provide contact information and to continue to provide guidance as the GWMP is developed and implemented. Copies of the presentation were provided to interested parties via email. Attendees included representatives from the following:

- Holy Cross Cemetery
- Lake Merced area golf courses
- Town of Colma

- City of Daly City
- City of San Bruno
- SFPUC

### 1.6.2 PUBLIC HEARINGS

#### 1.6.2.1 Intent to Adopt

A public hearing of Intent to Adopt a Groundwater Management Plan was held at the regular meeting of the San Bruno City Council at 7 p.m. on August 24, 2010 at the San Bruno Senior Center. The hearing was advertised in the *San Mateo Times*, on August 10, 2010 and August 17, 2010. A resolution was adopted by the City Council and subsequently was published in the San Mateo Times on September 8, 2010 and September 15, 2010. The advertisements and the resolution are included in Appendix A.

#### 1.6.2.2 Adoption

A public hearing to adopt the Groundwater Management Plan was held at the regular meeting of the San Bruno City Council at 7 p.m. on July 10, 2012 at the San Bruno Senior Center. The hearing was advertised in the *San Mateo Tim*es twice prior to the hearing. The advertisements and the resolution are included in Appendix A.

### 1.6.3 PUBLIC MEETINGS

A total of five public meetings were held to inform the public on the development of the groundwater management plan.

#### 1.6.3.1 Background, Components, and Process

Three public meetings were held at locations across the South Westside Basin to provide information on the importance of groundwater as a water supply, the need for management of the groundwater resource, the role of a GWMP, the role of the public in the development and implementation of the GWMP, and the preliminary goals, objectives, and elements of the groundwater management plan.

##### *1.6.3.1.1 San Bruno Presentation*

The presentation in the southern portion of the South Westside Basin was given at San Bruno City Hall on Thursday September 9, 2010 at 5:30 pm. The meeting was advertised on San Bruno's cable television station, noticed at City Hall, and advertised in the *San Mateo Times* on September 4, 2010.

##### *1.6.3.1.2 Daly City Presentation*

A presentation in the northern portion of the South Westside Basin at was given at Daly City City Hall on Thursday September 23, 2010 at 7:00 pm. The meeting was noticed at City Hall, on the city's web page, and on the city's cable television station. Interviews were provided to a student from San Francisco State University for airing on the campus radio station, KSFS.

##### *1.6.3.1.3 Colma Presentation*

The presentation in the central portion of the South Westside Basin was given at Colma Town Hall on Thursday October 13, 2010 at 11:30 am. The meeting was noticed at Town Hall. Extensive personal outreach was conducted to inform the numerous cemeteries that utilize private groundwater wells for their irrigation supply.

#### 1.6.3.2 Draft Plan Presentation

The fourth public meeting was held at Colma Town Hall on May 24, 2011 at 11:30am. The meeting was noticed at Town Hall and outreach was performed to inform the cemeteries. The draft Groundwater Management Plan was presented and stakeholders were provided an opportunity to discuss the draft Plan and provide comments either in person or at a later date.

#### 1.6.3.3 Distribution of Draft GWMP

The draft text of the GWMP was distributed to the public for comment on May 10, 2012. The comment period extended until June 9, 2012. One email was received with comments, which were addressed.

#### 1.6.3.4 Final Draft Plan Presentation

The fifth public meeting was held at San Bruno City Hall on May 23, 2012 at 5:30 pm. The meeting was noticed at City Hall and advertised in the *San Mateo Times* on May 20, 2012. The final draft Groundwater Management Plan and the activities moving forward were discussed.

## 1.7 SOUTH WESTSIDE BASIN GWMP ADVISORY COMMITTEE

The Advisory Committee was organized to solicit input and direct the development of the GWMP. Agencies and key stakeholders were provided written invitations to send to their representatives to invite them to participate in the Advisory Committee. Other stakeholders were invited to join through the public notification process, hearings, the web site, and public meetings. Table 1.3 lists the Advisory Committee members and their affiliations. Meetings were held from 2009 through 2011 to coordinate stakeholder input and incrementally build the GWMP. Agendas and minutes are included in Appendix A.

During implementation of the GWMP, it is anticipated that most of the members of the Advisory Committee will join the Groundwater Task Force. The Groundwater Task Force will guide the implementation of the GWMP and is described in more detail in Section 6.1.

**Table 1.3 Advisory Committee Members**

| Entity | Representative |
|---|---|
| Bay Area Water Supply and Conservation Agency | Anona Dutton |
| City of Brisbane | Randy L. Breault |
| City of Burlingame | Phil Monaghan |
| California Water Services Company | Tom Salzano |
| DWR | Mark Nordberg |
| Cemeteries | Roger Appleby |
| Town of Colma | Brad Donohue |
| City of Daly City | Patrick Sweetland |
| RWQCB | Kevin D. Brown |
| City of San Bruno | Will Anderson |
| SFPUC | Greg Bartow |
| City of South San Francisco | Terry White |
| Interested citizens | Robert Riechel |

### 1.7.1 DECEMBER 18, 2009 ADVISORY COMMITTEE MEETING 1

An Advisory Committee meeting was held on December 18, 2009 to coordinate the Advisory Committee, develop a common understanding of basin conditions and groundwater management plans, and to develop a goal or goals for the basin. The meeting was held at San Bruno City Hall and was well attended, including representatives of the following:

- California Water Services Company
- City of Brisbane
- City of Burlingame
- City of Daly City
- City of San Bruno
- RWQCB
- SFPUC
- Town of Colma
- Private citizens
- Cemeteries

The meeting minutes are included in Appendix A.

### 1.7.2 MARCH 11, 2010 ADVISORY COMMITTEE MEETING 2

The second Advisory Committee meeting was held on March 11, 2010 to discuss Basin Management Objectives (BMOs), both in general and specific to the South Westside Basin. The meeting was held at San Bruno City Hall and was attended by representatives of the following:

- Bay Area Water Supply and Conservation Agency
- DWR
- California Water Services Company
- City of Daly City
- City of San Bruno
- RWQCB
- SFPUC
- Town of Colma
- Cemeteries

The meeting minutes are included in Appendix A.

### 1.7.3 JUNE 24, 2010 ADVISORY COMMITTEE MEETING 3

An Advisory Committee meeting was held on June 24, 2010 to discuss comments received on the BMOs and to discuss the Elements of the Plan. The meeting was held at San Bruno City Hall and was attended by representatives of:

- Bay Area Water Supply and Conservation Agency
- DWR
- California Water Services Company
- City of Daly City
- City of San Bruno
- SFPUC
- Town of Colma

The meeting minutes are included in Appendix A.

### 1.7.4 AUGUST 16, 2010 ADVISORY COMMITTEE MEETING 4

An Advisory Committee meeting was held on August 16, 2010 to discuss basin governance and financing of the implementation of the groundwater management plan. The meeting was held at San Bruno City Hall and was attended by representatives of:

- DWR
- California Water Services Company
- City of Daly City
- City of San Bruno
- RWQCB
- SFPUC

- Town of Colma

The meeting minutes are included in Appendix A.

### 1.7.5 FEBRUARY 3, 2011 ADVISORY COMMITTEE MEETING 5

An Advisory Committee meeting was held on February 3, 2011 to discuss the recent completion of a revision to the Westside Basin Groundwater Flow Model and the utility of the model in the development of the GWMP. The discussion included using the model to estimate the basin yield. The meeting was held at San Bruno City Hall and was attended by representatives of:

- California Water Services Company
- City of Daly City
- City of San Bruno
- SFPUC
- Town of Colma
- Cemeteries

The meeting minutes are included in Appendix A.

### 1.7.6 APRIL 28, 2011 ADVISORY COMMITTEE MEETING 6

An Advisory Committee meeting was held on April 28, 2011 to update the current status of the Groundwater Management Plan to provide information to focus the review to be performed by the Advisory Committee. Progress toward participation in the CASGEM program was also discussed.

The meeting was held at San Bruno City Hall and was attended by representatives of:

- DWR
- California Water Services Company
- City of Daly City
- City of San Bruno
- SFPUC
- Town of Colma
- Cemeteries

The meeting minutes are included in Appendix A.

### 1.7.7 APRIL 15, 2011 DISTRIBUTION OF DRAFT GWMP

The draft text of the GWMP was distributed to the Advisory Committee for comment on April 15, 2011. Comments were received from BAWSCA, CalWater, San Bruno, SFPUC, and Steve Lawrence and incorporated into the text as appropriate.

## 1.8 GROUNDWATER MANANGEMENT PLAN AND CONSISTENCY WITH CALIFORNIA WATER CODE

Groundwater management is the planned and coordinated local effort of sustaining the groundwater basin in order to meet future water supply needs. With the passage of AB 3030 in 1992, local water agencies were provided a systematic way of formulating GWMPs (California Water Code, § 10750 et. seq.). SB 1938, passed in 2002, further emphasizes the need for groundwater management in California. SB 1938 requires AB 3030 GWMPs to contain specific plan components in order to receive state funding for water projects.

The South Westside Basin Groundwater Management Plan is prepared consistent with the provisions of California Water Code § 10750 et seq. as amended January 1, 2003. The South Westside Basin GWMP includes the seven components that are required to be eligible for DWR funds for the construction of groundwater projects or groundwater quality projects. The GWMP also addresses the 12 specific technical issues identified in the Water Code along with the seven recommended components identified in DWR Bulletin 118-03 (DWR, 2003). Table 1.4 lists the required and recommended components and identifies the specific section of this GWMP in which the components are discussed.

**Table 1.4 South Westside Basin GWMP Components**

| Component | GWMP Section(s) |
|---|---|
| *SB 1938 Mandatory* | |
| 1. Documentation of public involvement | 1.6, 1.7, App. A |
| 2. BMOs | 4.3 |
| 3. Monitoring and management of groundwater elevations, groundwater quality, inelastic land subsidence, and changes in surface water flows and quality that directly affect groundwater levels or quality | 5.2 |
| 4. Plan to involve other agencies located in the groundwater basin | 5.1 |
| 5. Adoption of monitoring protocols | 5.2, App. C |
| 6. Map of groundwater basin boundary, as delineated by DWR Bulletin 118, with boundaries of agencies subject to the GWMP | Figures 1.1, 1.2, and 1.3 |
| 7. For agencies not overlying groundwater basins, GWMP prepared using appropriate geologic and hydrogeologic principles | n/a |
| *AB 3030 and SB 1938 Voluntary* | |
| 1. Control of saline water intrusion | 5.4.1 |
| 2. Identification and management of well protection and recharge areas | 5.4.2 |
| 3. Regulation of the migration of contaminated groundwater | 5.4.3 |
| 4. Administration of well abandonment and destruction program | 5.4.4 |
| 5. Control and mitigation of groundwater overdraft | 5.3.1 |
| 6. Replenishment of groundwater | 5.3.2 |
| 7. Monitoring of groundwater levels | 5.2.1, App. C |
| 8. Development and operation of conjunctive use projects | 5.3.3 |
| 9. Identification of well construction policies | 5.4.5 |
| 10. Construction and operation of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects | 5.5 |
| 11. Development of relationships with state and federal regulatory agencies | 5.6.1 |
| 12. Review of land use plans and coordination with land use planning agencies to assess activities that create reasonable risk of groundwater contamination | 5.6.3 |
| *DWR Bulletin 118 Recommended* | |
| 1. Management with guidance of advisory committee | 1.7, 5.1 |
| 2. Description of area to be managed under GWMP | 1.1, Figures 1.1, 1.2, and 1.3 |
| 3. Links between BMOs and goals and actions of GWMP | 4, 6 |
| 4. Description of GWMP monitoring programs | 5.2, App. C |
| 5. Description of integrated water management planning efforts | 1.5, 5.6.2 |
| 6. Report of implementation of GWMP | 5.7 |
| 7. Periodic evaluation of GWMP | 5.7 |

# 2 WATER RESOURCES CONDITIONS

## 2.1 CLIMATE

The South Westside Basin's location in a valley between the Pacific Ocean and San Francisco Bay gives it a variable, but mild, marine climate. Winters are mild and moderately wet and summers are cool and dry (National Oceanic and Atmospheric Administration, 2009). The valley serves as a gap in the coast range, allowing cool, moist marine air into the central Bay Area. Generally, areas closer to the Pacific Ocean or closer to the valley experience the most marine effects, notably lower summer temperatures and lower evapotranspiration, while those areas in the south of the basin, such as Burlingame, experience less marine influence and have more sunshine, higher summer temperatures, and higher evapotranspiration rates.

This climate, along with limited outdoor water use, contributes to water demand that is only somewhat higher in the summer than in the winter. Average monthly temperature and reference evapotranspiration data are shown in Table 2.1. Temperature data are from San Francisco International Airport (SFIA), within the Plan Area; however, the closest reference evapotranspiration data is from Woodside, south of the Plan Area. Temperature, evapotranspiration, and rainfall are variable in the basin and are driven by proximity to the Pacific Ocean and local topography. Areas closer to the ocean are cooler and cloudier, with lower evapotranspiration. Higher elevation areas have more rainfall.

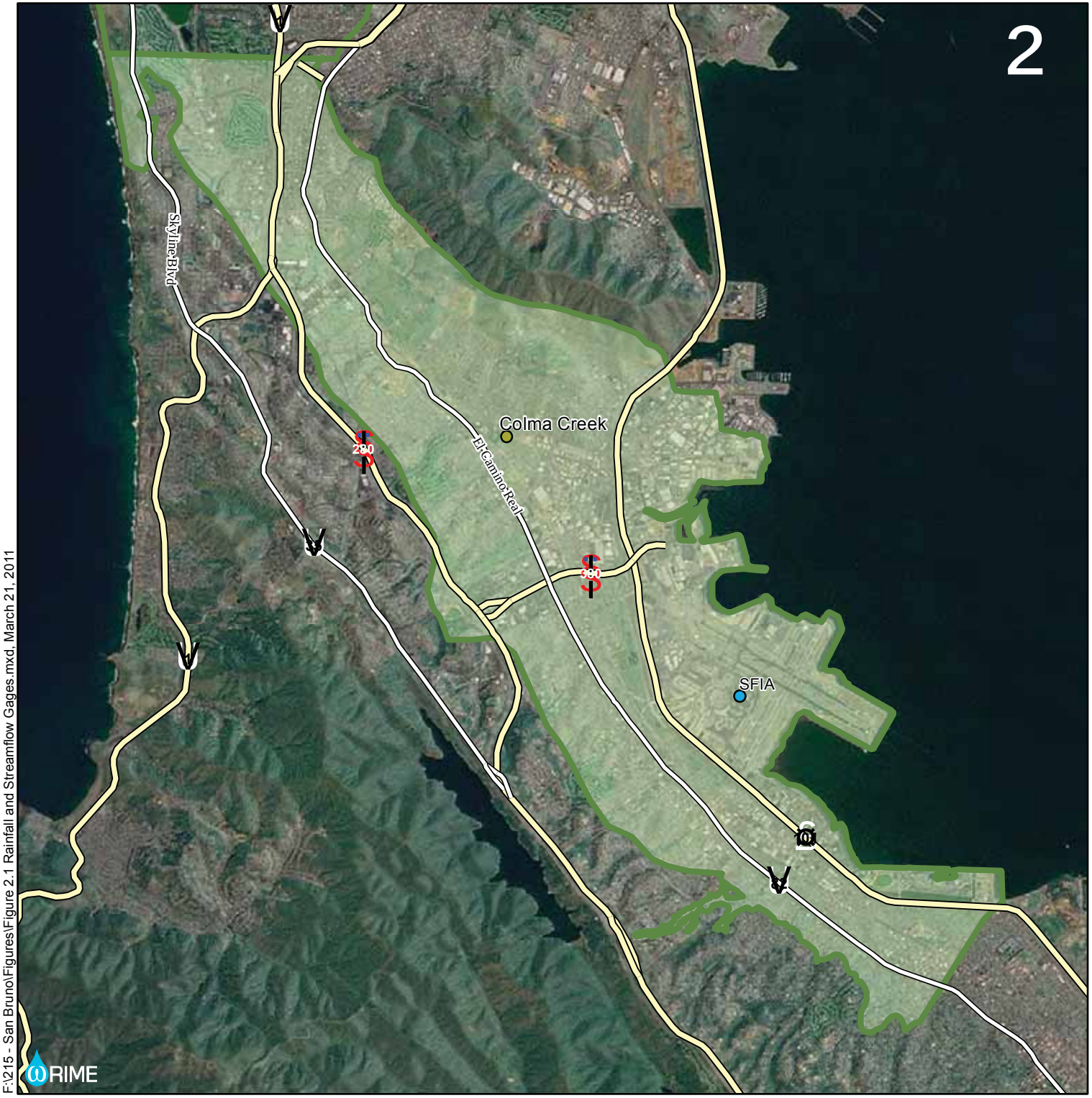
**Table 2.1 Average Monthly Temperature and Reference Evapotranspiration**

| Parameter | Month | | | | | | | | | | | | Annual |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
| Average maximum temperature (°F)* | 55.8 | 59.1 | 61.2 | 63.8 | 66.8 | 70.0 | 71.4 | 72.1 | 73.5 | 70.1 | 62.9 | 56.4 | 65.3 |
| Average minimum temperature (°F)* | 42.5 | 45.0 | 46.2 | 47.7 | 50.3 | 52.7 | 54.1 | 55.0 | 54.9 | 51.9 | 47.4 | 43.2 | 49.2 |
| Precipitation (inches)** | 4.4 | 3.6 | 2.8 | 1.4 | 0.4 | 0.1 | 0.0 | 0.1 | 0.2 | 1.0 | 2.3 | 3.7 | 20.0 |
| Average reference evapotranspiration (inches)*** | 1.83 | 2.21 | 3.42 | 4.84 | 5.61 | 6.26 | 6.47 | 6.22 | 4.84 | 3.66 | 2.36 | 1.83 | 49.54 |

* Source: Western Regional Climate Center, 2011. San Francisco WSO AP, California (047769). Period of record 7/1948 – 9/2010.
** Source: NOAA-NCDC, 2007, 2009, 2011
*** Source: California Irrigation Management Information System (CIMIS), 2009. 96 Woodside. Period of record 10/1990 – 1/1994

The National Weather Service through its Cooperative Network collects rainfall data at SFIA: Coop ID #047769 (see Figure 2.1). Data are available from May 1928 through present.

The historical record of annual rainfall and the cumulative departure from annual mean at SFIA are shown in Figure 2.2. The long-term average annual precipitation for the period from 1949 to 2010 is 20 inches. Figure 2.3 shows the long-term average monthly precipitation at SFIA. Most precipitation occurs as rainfall during the mild winters, from November through April. A map of the spatial distribution of precipitation by HydroFocus (2011) is shown in Figure 2.4. Across the basin, annual precipitation ranges from less than 20 inches along San Francisco Bay near SFIA and along the Pacific Ocean in Daly City to approximately 24 inches in the center of the valley near Colma and South San Francisco to approximately 30 inches in the hills above the valley.




# Figure 2.1
Rainfall and Streamflow Gages

**Legend**

- Highways
- Groundwater Basin
- Plan Area
- NOAA Precipitation Gage
- USGS Streamflow Gage

F:\215 - San Bruno\Figures\Figure 2.1 Rainfall and Streamflow Gages.mxd, March 21, 2011

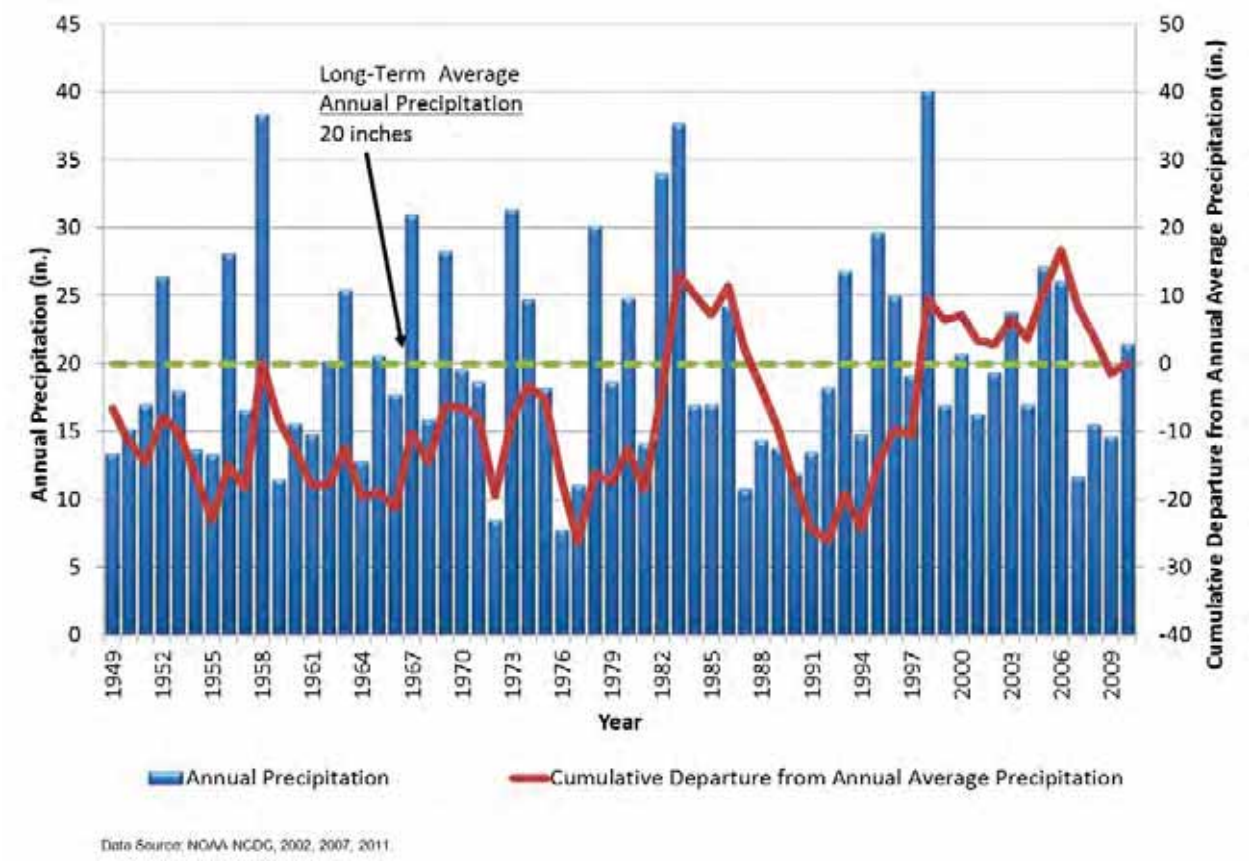



**Figure 2.2 Historical Annual Precipitation and Cumulative Departure from Mean Precipitation**

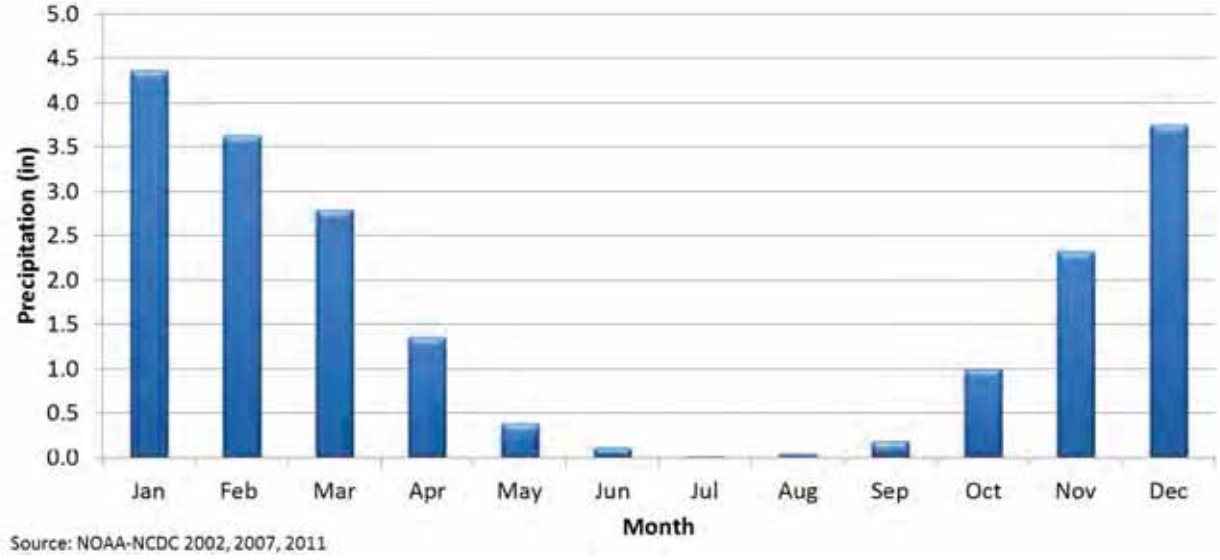
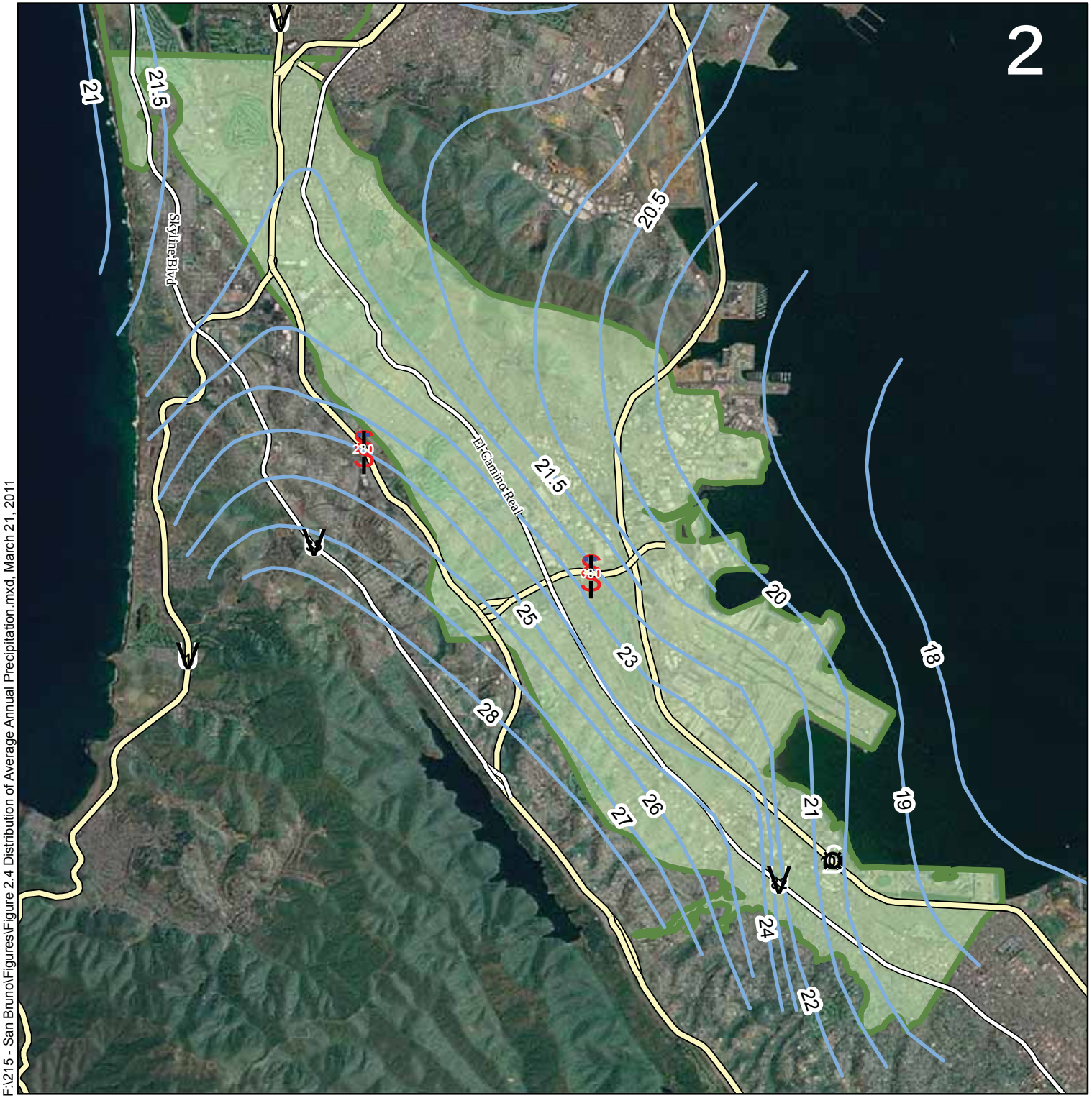



**Figure 2.3 Average Monthly Precipitation**




# Figure 2.4
## Distribution of Average Annual Precipitation

**Legend**

- Precipitation (in)
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

Source: Precipitation - HydroFocus, 2011

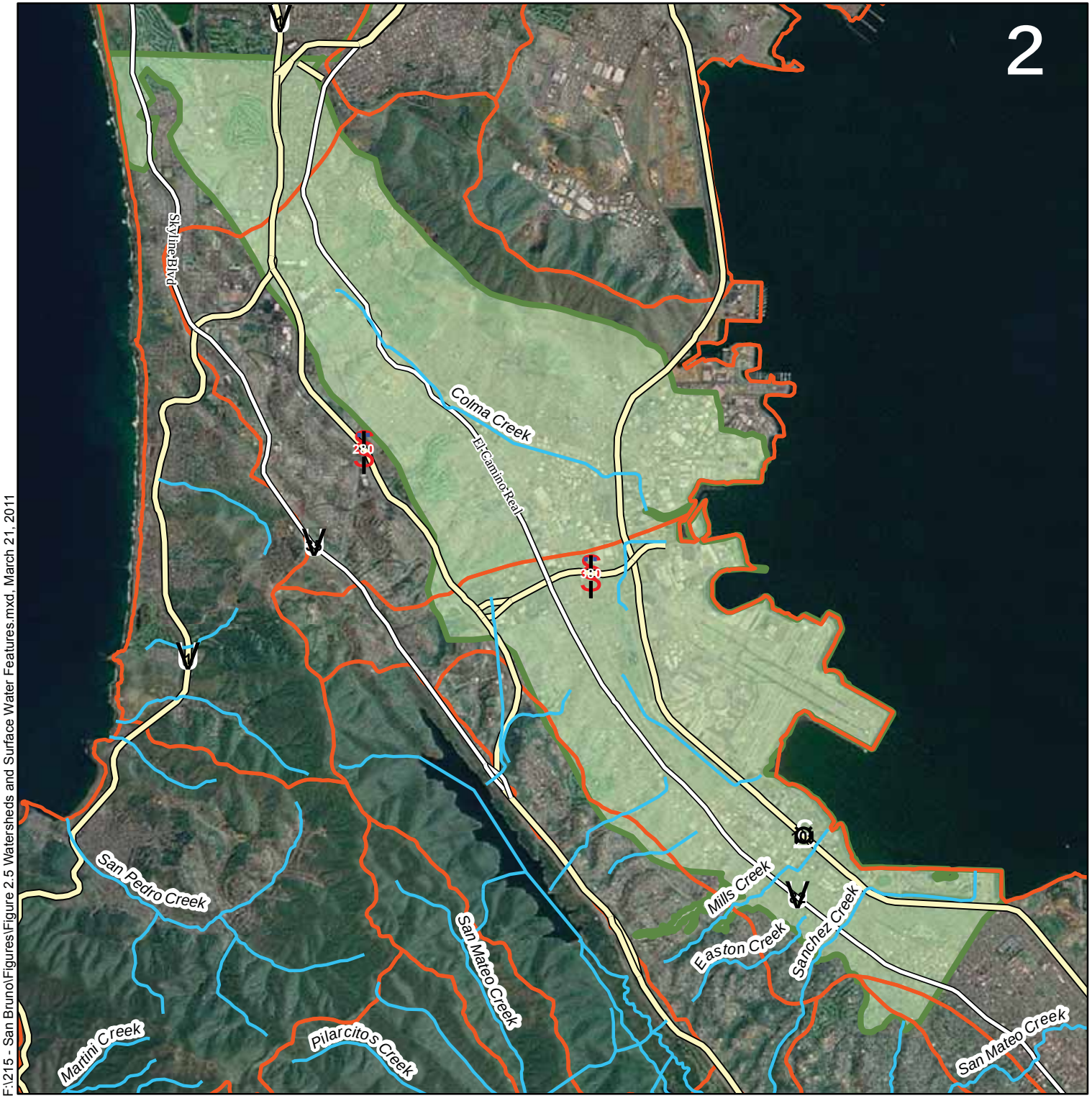
F:\215 - San Bruno\Figures\Figure 2.4 Distribution of Average Annual Precipitation.mxd, March 21, 2011

## 2.2 SURFACE WATER

Major watersheds and surface water features are shown in Figure 2.5. The largest watersheds are Colma Creek Watershed and Vista Grande Watershed.

Colma Creek is a small creek draining much of South San Francisco and the surrounding area before entering into San Francisco Bay just north of SFIA and the eastern terminus of Interstate 380. Within the valley portion of the watershed, Colma Creek is an open engineered channel from the bay to near the Colma/South San Francisco city line. Much of the area upstream of South San Francisco and some small tributaries within South San Francisco drains through underground storm drains. Some of the uppermost reaches of the creek are natural channels, particularly on the slopes of San Bruno Mountain (Oakland Museum of California, 2011).

The only USGS streamflow gage in the South Westside Basin was located on Colma Creek (Figure 2.1). No longer active, the gage has recorded data from 1963 until 1996. Average monthly flows from the gage are presented on Figure 2.6a and the percent exceedance of daily streamflow is shown in Figure 2.6b. Average monthly streamflow is low, less than 5 cubic feet per second (cfs) in the summer and less than 20 cfs in the winter. High flow conditions are typically below 200 cfs. Work has been performed on the stream channel to reduce flooding in the area, particularly near Holy Cross Cemetery.




# Figure 2.5
## Watersheds and Surface Water Features

**Legend**

- Creeks/Streams
- Highways
- Watersheds
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

Source: NHD database and USGS

F:\215 - San Bruno\Figures\Figure 2.5 Watersheds and Surface Water Features.mxd, March 21, 2011

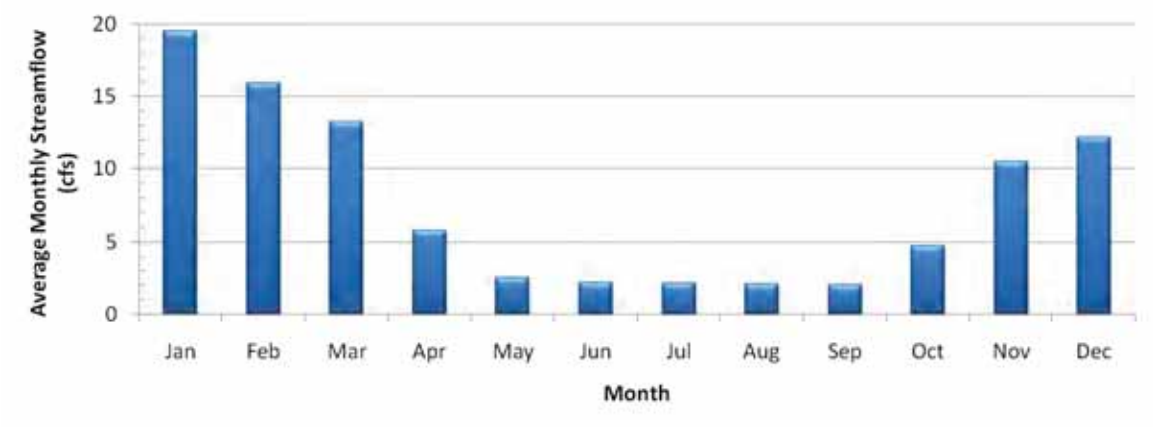



**Figure 2.6a Average Monthly Colma Creek Streamflow, 1963-1996**

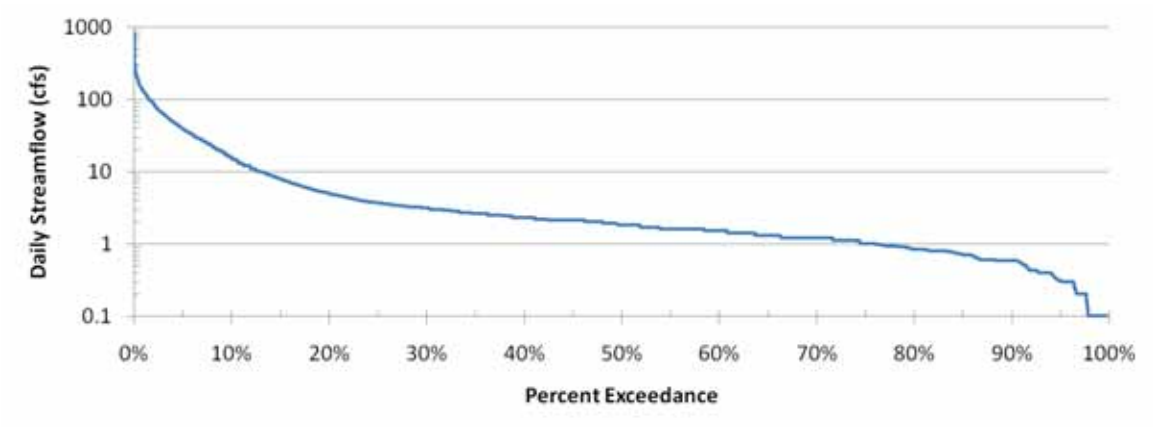



**Figure 2.6b Daily Colma Creek Streamflow Exceedance, 1963-1996**

The Vista Grande Watershed historically drained into Lake Merced, but has since been altered to flow to the Pacific Ocean. The 2.5 square mile watershed includes portions of Daly City as well as portions of unincorporated San Mateo County. Stormwater flows through the Vista Grande Canal for about 3,500 feet before flowing into the Vista Grande Outfall Tunnel. The tunnel discharges to the Pacific Ocean through an outfall beach structure below Fort Funston in Golden Gate National Recreation Area. (RMC, 2006)

Other creeks in the South Westside Basin include:

- San Bruno Creek in San Bruno
- Millbrae Creek in Millbrae
- Mills Creek in Burlingame
- Sanchez Creek in Burlingame

- San Mateo Creek, just south of the South Westside Basin in San Mateo

The major water features in the North Westside Basin are Lake Merced and several smaller lakes. These features, as they relate to groundwater, are discussed in the draft North Westside Basin GWMP.

## 2.3 GROUNDWATER

### 2.3.1 GEOLOGIC SETTING

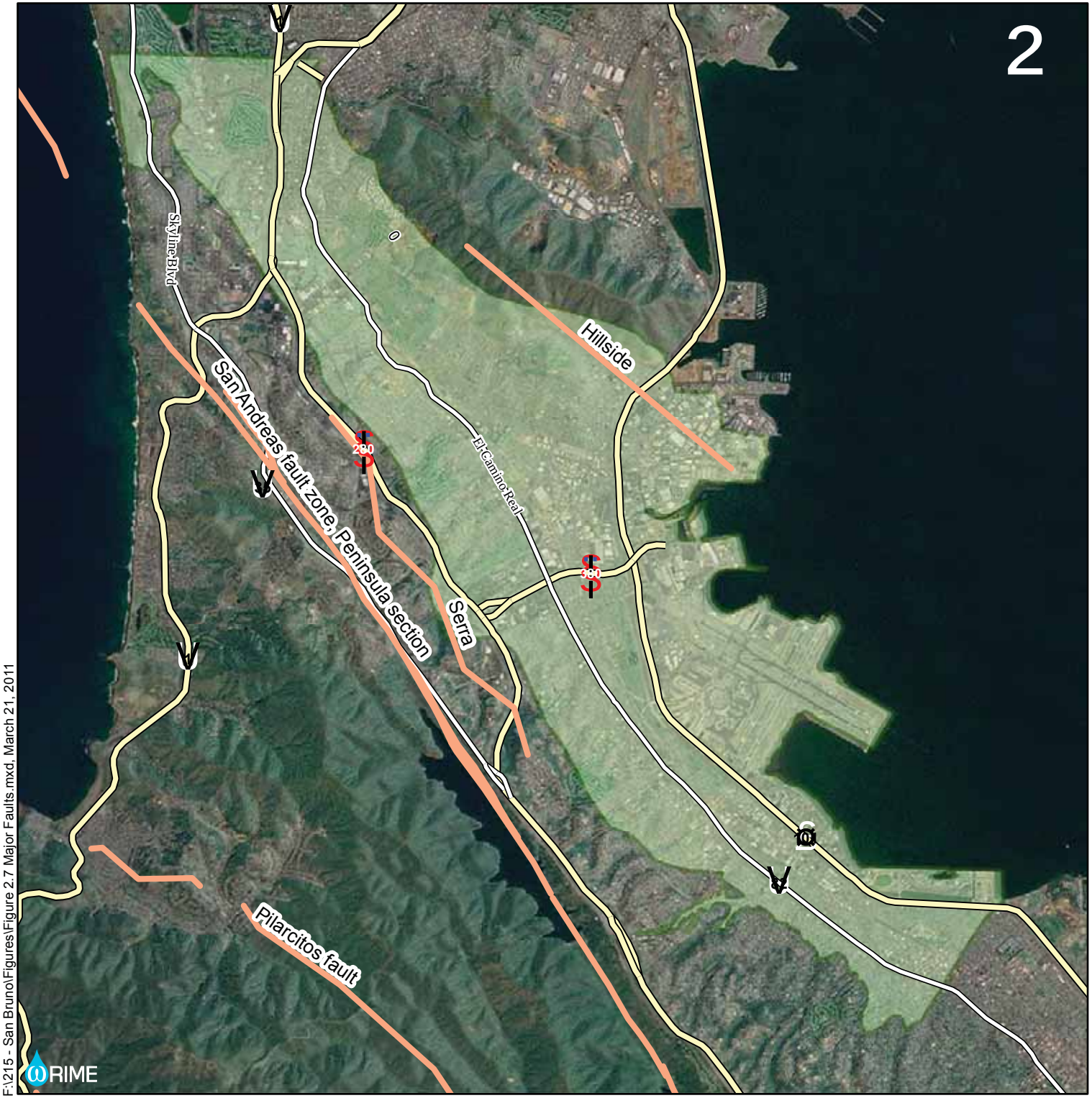
The South Westside Basin is a structural basin within the Coast Ranges province of California. The Coast Ranges are dominated by northwest oriented mountain ranges and valleys. The mountains are steep but modest in elevation. Locally, the Santa Cruz Mountains and the valley that makes up the South Westside Basin are part of these features. Highest elevations include the following:

- Scarpet Peak southwest of the basin, 1,944 feet (ft)
- San Bruno Mountain northeast of the basin, 1,316 ft
- Mount Davidson in San Francisco, 927 ft

The northwest trend is a result of tectonics, with major northwest trending faults in the vicinity of the South Westside Basin: San Andreas Fault, Serra Fault, and the Hillside Fault (Figure 2.7)

The Franciscan Formation forms the basement underlying the unconsolidated sediments that are the primary sources of groundwater for the area and forms most of the mountains surrounding the South Westside Basin (Burns & McDonnell and ERM-West, 2006; Bonilla 1998). A map of bedrock elevation is presented on Figure 2.8 based on HydroFocus (2003). The Mesozoic-age formation is highly deformed and comprised of a unique mix of rocks related to tectonic subduction. This subduction resulted in materials from the oceanic plate being scraped off and accreted onto the continental materials as well as low-temperature, high-pressure metamorphism. The scraping results in the presence of deep-ocean materials such as chert, while metamorphism results in rocks such as serpentine and blueshist. The most common materials are greywacke (a poorly sorted sandstone containing angular clasts) and shale, resulting from deep ocean deposition in a method similar to a landslide. Composition of the Franciscan Formation is variable; locally the Franciscan has significant greywacke and shale in what is known as the San Bruno Mountain terrane to the northeast of the South Westside Basin and pillow basalts, minor chert, limestone, and greywacke in what is known as the Permanente terrane to the southwest (Sloan, 2006).

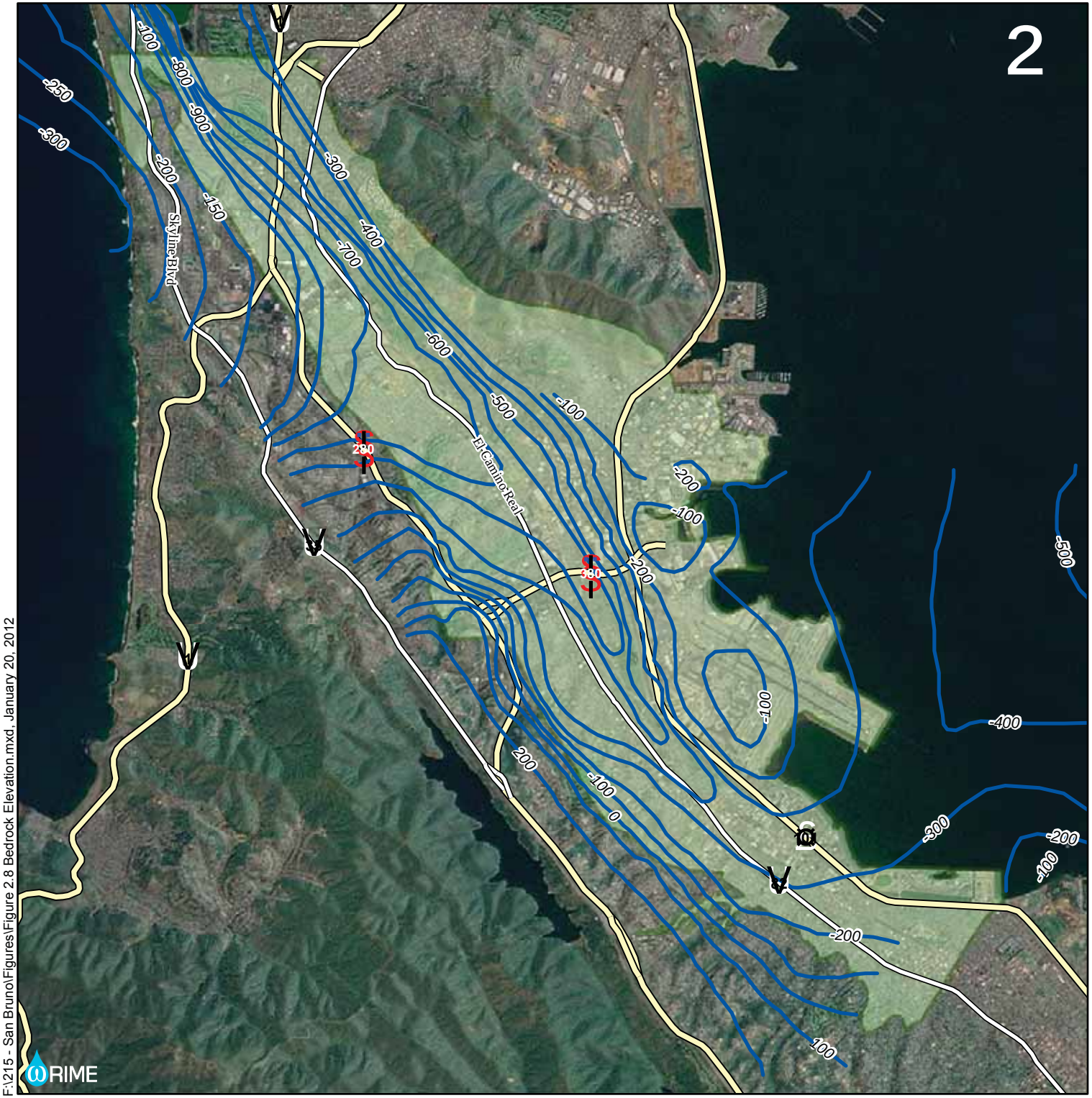
The Merced Formation and the Colma Formation are the major unconsolidated units in the South Westside Basin and are the primary sources of groundwater. These formations were




# Figure 2.7
## Major Faults

**Legend**

- Highways
- Plan Area
- Faults




# Figure 2.8
## Bedrock Elevation

**Legend**

- Highways
- Plan Area
- Bedrock Elevation (ft)

0 0.5 1 2 Miles

Source: Bedrock Elevation - Phillips et al., 1993 and Hensolt and Brabb, 1990 as cited in HydroFocus, 2003

F:\215 - San Bruno\Figures\Figure 2.8 Bedrock Elevation.mxd, January 20, 2012

ORIME

deposited on top of the Franciscan. During recent geologic history, the South Westside Basin alternated between being submerged below the Pacific Ocean and being above sea level, the result of tectonic subsidence, changes in sea level due to global climatic conditions, and tectonic uplift. At least 30 episodes of transgression and regression are recorded in the Merced and Colma Formations near Daly City (Clifton and Hunter, 1987, 1991) as changes from shallow marine to non-marine sediments. These episodes resulted in the layers of clays and sands seen in the subsurface today.

The Merced Formation contains several major beds of sands and clays. The lower portion of the formation contains locally derived materials from the Coast Ranges, while the upper portion contains sediment from the Sierra Nevada and Cascades identifying the movement of the outlet of the Sacramento and San Joaquin rivers near their current outlet at the Golden Gate.

Beds in the vicinity of coastal Daly City dip to the northeast at 45 to 70 degrees in the lower 4,000 ft; 25 to 45 degrees in the middle 600 ft; and 5 to 20 degrees in the upper 500 ft (LSCE, 2004). The Merced Formation dips more than 40 degrees to the northeast in the portion of the South Westside Basin from San Bruno to Daly City (Fio and Leighton, 1995). From San Bruno into Millbrae and between the Serra and San Andreas faults, the Merced dips to the southwest and to the northeast, depending on location, due to faulting and folding (Rogge, 2003). East of the Serra Fault, the Merced appears to dip to the northeast based on observations by Rogge.

The Colma Formation has a very similar mineral composition to the underlying Merced Formation. The Colma Formation is younger (Pleistocene-age) than the Merced and was deposited on top of the tilted Merced Formation. The layering in the Colma Formation remains primarily horizontal (Sloan, 2006).

Bay Muds are also present along the margins of San Francisco Bay at ground surface or below artificial fill. These recently deposited materials are fine-grained clays and silts with organic matter and minor sand lenses that were deposited in still waters and accumulated as sea levels rose (Lee and Praszker, 1969).

### 2.3.2 WATER-BEARING FORMATIONS

Groundwater used for water supply within the South Westside Basin is found in the Merced and Colma formations discussed above. Water is produced from the coarse-grained layers within these complex, layered formations. Grain size typically decreases from the northwest to the southeast.

The elevation of the bedrock surface is shown in Figure 2.8; the deepest portions of the basin is in the northwest, becoming thin in Millbrae and south into Burlingame. Water bearing formations are also thin near San Francisco Bay due to a bedrock ridge extending in a north-

south orientation near SFIA, which, together with surficial deposits of Bay muds in these areas, reduces the potential for seawater intrusion in this area (WRIME, 2007).

The "W" clay is a major aquitard in the Daly City area, with municipal production occurring below the "W" clay. The "W" clay is not present south of Daly City, but a fine grained unit at 300 ft below mean sea level is present in the South San Francisco area (LSCE, 2004) and several clay units are in the upper portion of the aquifer in the San Bruno area. Perched aquifer conditions occur throughout the Plan Area. Numerous shallow wells installed for remediation or monitoring of contaminants nearly always encounter the water table within 30 feet of ground surface (HydroFocus, 2003).

The characteristics of the water bearing formations have been studied through several aquifer tests outlined in the *Alternatives Analysis Report* (MWH, 2007) and are summarized below. These tests provide estimates of transmissivity, a measure of the ability of an aquifer to transmit groundwater. For the South Westside Basin as a whole, previous studies have shown a range of transmissivities of 668 to 4,100 $ft^2$/day (CH2M HILL, 1997 *as referenced in* MWH, 2007). More specifically, transmissivities have been estimated for the following:

- Daly City area at the Jefferson Well as 2,190 $ft^2$/day
- CalWater wellfield area as 1,000 to 20,000 $ft^2$/day
- San Bruno area at SB-16 as 1,890 $ft^2$/day (LSCE, 2004; MWH, 2007)

### 2.3.3 PARTIAL BARRIERS TO SEAWATER INTRUSION

The lack of historical seawater intrusion despite historical data of groundwater levels below sea level near both the Pacific Ocean and San Francisco Bay is likely due to natural hydrogeologic conditions that act as partial barriers and inhibit the flow of water from these saltwater bodies into the freshwater aquifer.

#### 2.3.3.1 Pacific Ocean

Significant faulting and folding of the Merced Formation near the Pacific Ocean has been shown to be a barrier to seawater intrusion from the Pacific Ocean. It has been concluded that groundwater extraction within the South Westside Basin largely occurs within sequences with no direct connection with the Pacific Ocean (LSCE, 2010). Monitoring wells at Thornton Beach and Fort Funston exhibit groundwater levels above sea level. The potential for seawater intrusion is more likely to the north of Fort Funston, in the vicinity of LMMW-6D, where the faulted and folded conditions do not exist and there is a potential pathway into the South Westside Basin from the northwest. This area, however, is farther from the influence of active production wells and water levels are thus higher than elsewhere in the South Westside Basin. A network of monitoring wells are used to collect groundwater data along the Pacific Ocean: at

the Old Great Highway, the northwestern part of Golden Gate Park, the Oceanside Wastewater Treatment Plan, the San Francisco Zoo, Fort Funston, and Thornton Beach.

#### 2.3.3.2 San Francisco Bay

Relatively thick Bay Mud deposits and a buried bedrock ridge within 50 to 300 ft of the land surface provide some protection to the southern portion of the South Westside Basin from seawater intrusion from San Francisco Bay. Previous efforts have identified areas where the depth to bedrock is deepest and installed monitoring well clusters in the two most likely locations for seawater intrusion. These wells (SFO-S, SFO-D, Burlingame-S, Burlingame-M, and Burlingame-D) provide water level and water quality data. While this barrier has been historically effective, hydraulic connections between the main pumping aquifer and shallower wells closer to the Bay have been shown through water level impacts when San Bruno groundwater production wells are turned on (impacts at SFIA monitoring wells; ERM (2005)) and through depressed water levels near the bayshore (including SFO-S, SFO-D, Burlingame-S, Burlingame-M, and Burlingame-D). While not a completely understood pathway from San Francisco Bay into the main pumping aquifer, this hydraulic connection indicates that there is some potential for seawater intrusion in the future in this area. Risks of seawater intrusion increase with greater gradients between depressed groundwater levels in the drinking water aquifer and sea level at San Francisco Bay. Such risks can be reduced through increasing groundwater levels by increased recharge or decreased groundwater production.

### 2.3.4 SOILS

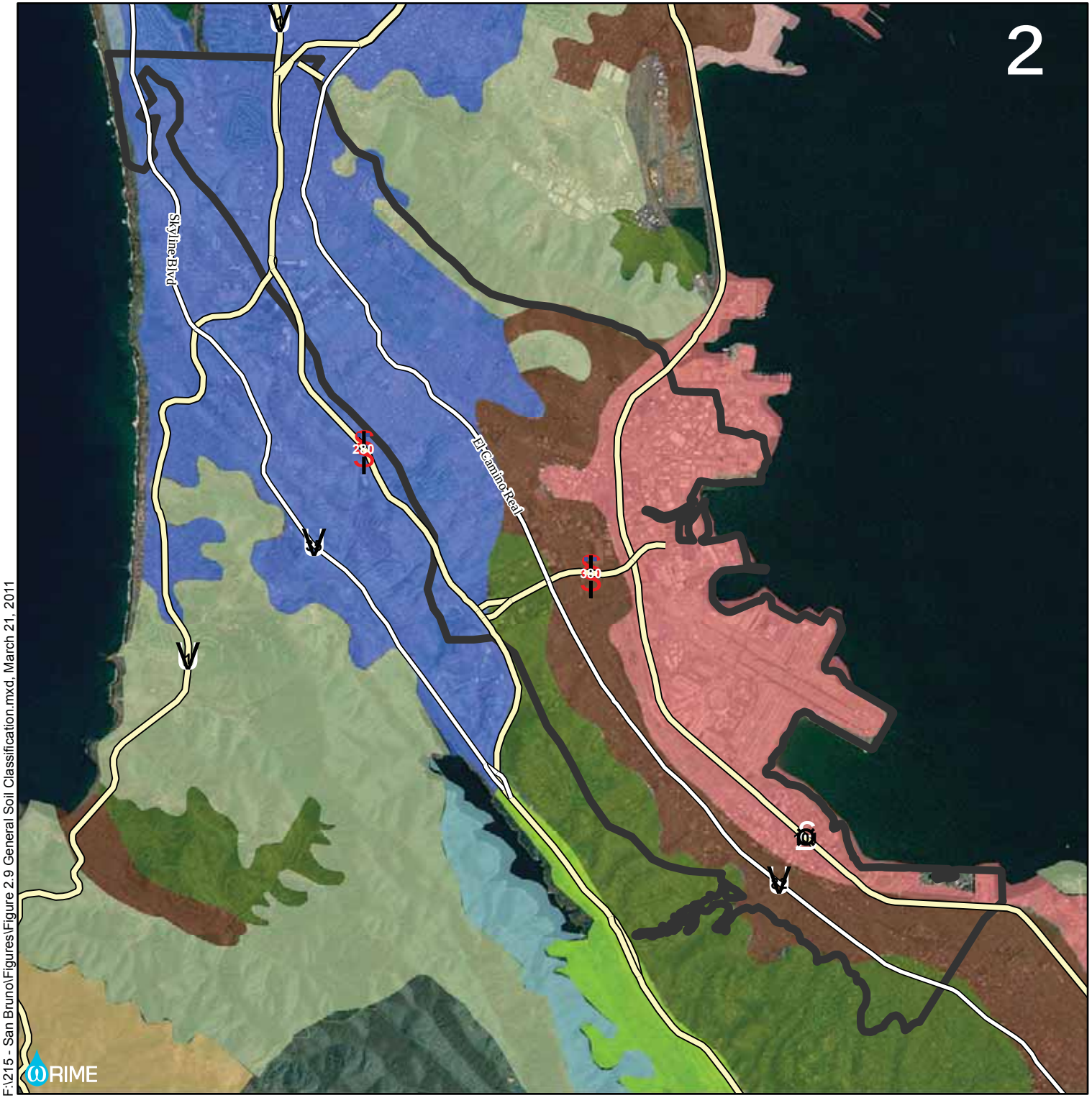
Surface soils impact the amount of water that infiltrates to groundwater rather than contributing to surface runoff. The characteristics of surface soils thus play a role in groundwater recharge. Due to the urban nature of the area, the U.S. Department of Agriculture Natural Resources Conservation Service (USDA-NRCS) does not have a comprehensive classification of these soils according to their infiltration capacity. However, USDA-NRCS does summarize the general soils for the area (Figure 2.9). Generally, soils in the northwest (Daly City and Colma) are well drained soils associated with former sand dunes (categorized as "Urban land-Orthents, smoothed"). Soils in the southeast (San Bruno, Millbrae, and Burlingame) have variable drainage properties in the low elevations near and to the east of El Camino Real (categorized as "Urban land-Orthents, reclaimed" and "Urban land-Orthents") and are well drained in the uplands to the west of El Camino (categorized as "Urban land-Orthents, cut and fill").

### 2.3.5 RECHARGE

Additional water is added to the aquifer system through recharge, the percolation of water downward from the ground surface through unsaturated sediments into the aquifer. The amount of recharge is controlled by

- Climate, including precipitation and evapotranspiration
- The slope of the ground surface, which impacts whether water seeps into the ground or becomes runoff into surface drainages
- Land use, including the amount of impervious surfaces, plant types, and usage of irrigation
- Leakage from water and sewer pipes
- Soil characteristics
- Subsurface characteristics

Estimates of recharge for the South Westside Basin were developed for the Groundwater Model (HydroFocus, 2011) and are summarized in Figure 2.10. The recharge estimates show that groundwater recharge is highest in the northwestern portions of the basin, corresponding to areas of sandy soils, and in areas with significant unpaved, irrigated land, such as golf courses and cemeteries. Recharge is lowest along the margins of San Francisco Bay, corresponding to areas with Bay Muds, and along the steep slopes of San Bruno Mountain.




# Figure 2.9
## General Soil Classification

**Legend**

- Highways
- Plan Area

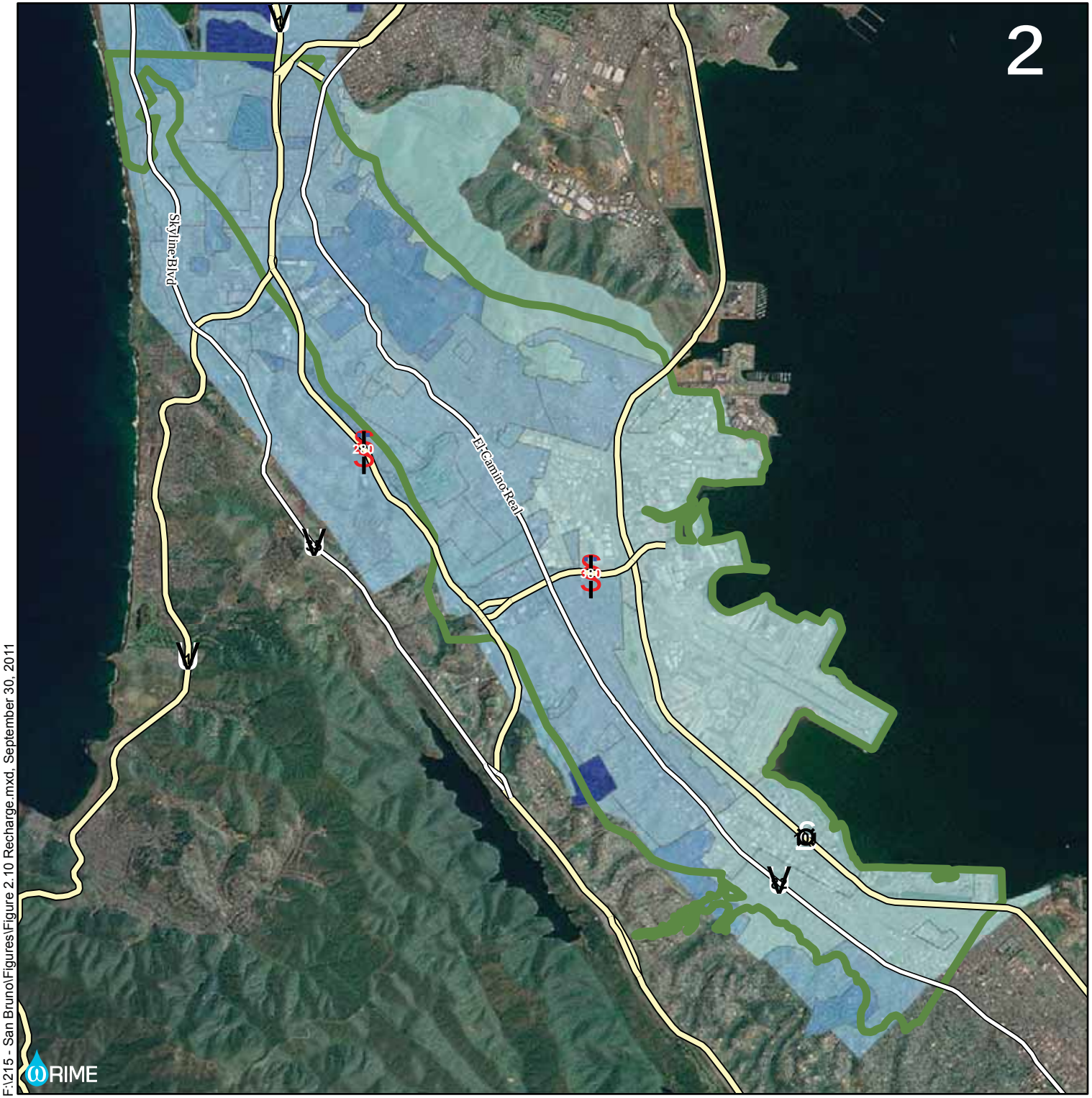
**Soil Types**

- Urban Land-Sirdrak
- Urban Land-Orthents, smoothed
- Alambique-McGarvey
- Scarper-Miramar
- Barnabe-Candlestick-Buriburi
- Fagan-Obispo
- Urban Land-Orthents, cut and fill
- Alambique-Zeni-Zeni Variant
- Novato-Reyes
- Urban Land-Orthents, reclaimed
- Urban Land-Orthents

0 0.5 1 2 Miles

Source: Soils - USDA - SCS, 1991

F:\215 - San Bruno\Figures\Figure 2.9 General Soil Classification.mxd, March 21, 2011




# Figure 2.10
## Estimated Recharge

**Legend**

Highways

**Recharge (inches per year)**

- 0 - 4
- 4 - 8
- 8 - 12
- 12 - 16

Plan Area

0 0.5 1 2 Miles

Source: Recharge - HydroFocus, 2011

F:\215 - San Bruno\Figures\Figure 2.10 Recharge.mxd, September 30, 2011

WRIME

### 2.3.6 EARLY DEVELOPMENT AND GROUNDWATER USAGE

Early development in the South Westside Basin was primarily agricultural, with dairy cattle operations serving the nearby cities. Development of the type seen today began around the turn of the 20th century. Burials within the City of San Francisco were prohibited in 1900 and existing cemeteries were evicted in 1937. These events resulted in the establishment of the cemeteries in Colma. The 1906 earthquake resulted in the migration of people out of the damaged cities and into the undeveloped and newly developed areas in the South Westside Basin, particularly along the streetcar line that extended from San Francisco south through Daly City, San Bruno and beyond, as far as San Mateo by the late 1890s (Gillespie and Gillespie, 2009). San Francisco International Airport began operating in 1927, further driving urban growth. The most significant urban growth occurred during World War II as numerous industrial facilities operated out of South San Francisco, resulting in demand for area housing and commercial space. This growth continued until the area approached build-out. Historical population growth for the cities in the South Westside Basin (right axis), as well as for San Francisco (left axis), is shown in Figure 2.11.

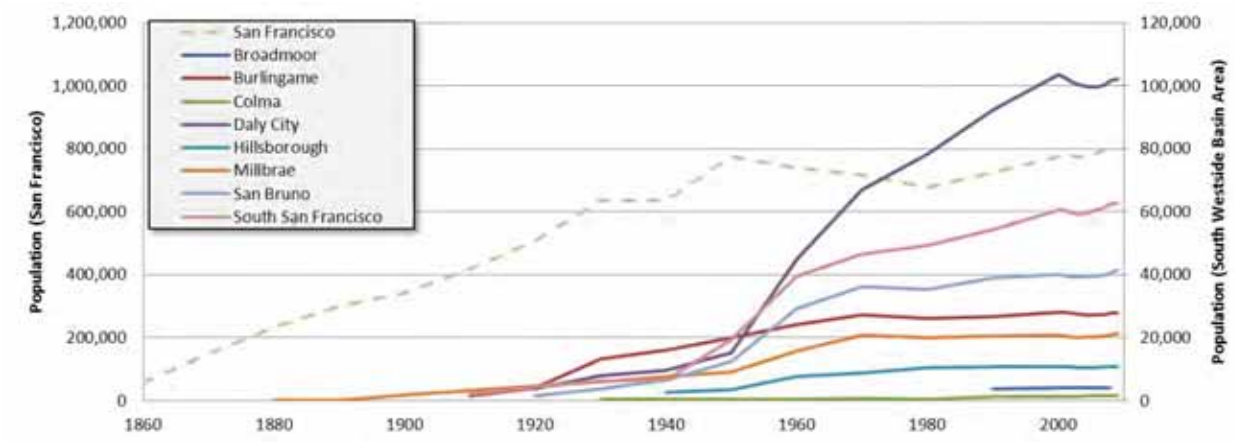



**Figure 2.11. Historical Population Growth in the South Westside Basin**

Historical groundwater use increased with development of the South Westside Basin through the 1960s. Beginning in the 1960s, groundwater use by municipal users began to decline (Figure 2.12), a result of conservation by customers as well as operational decisions as the water agencies have access to both groundwater and imported water through SFPUC's Hetch Hetchy system. Since the early 1960s, municipal groundwater use in the South Westside Basin has declined by approximately 25 percent, while imported water use has increased by approximately 40 percent.

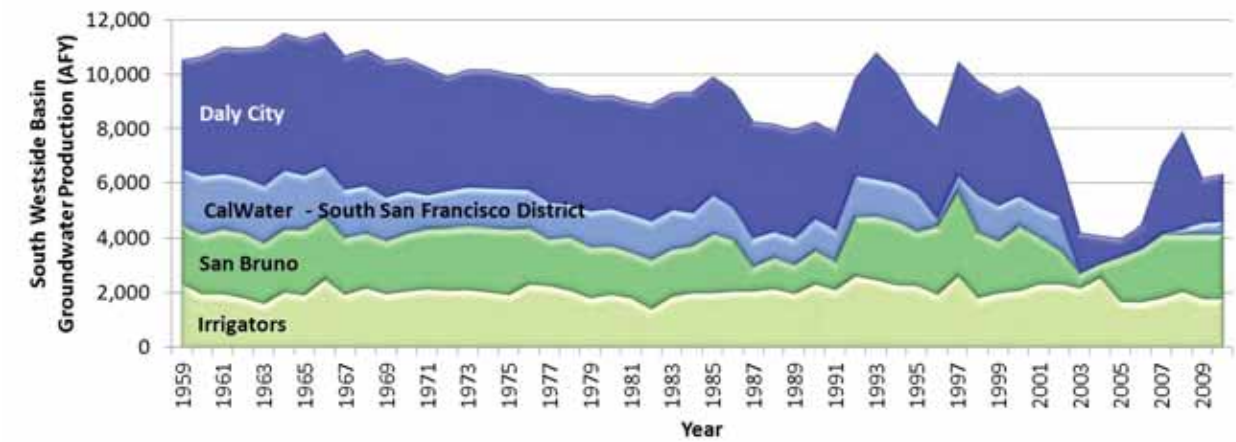



**Figure 2.12. Historical Municipal Groundwater Production, South Westside Basin**

### 2.3.7 GROUNDWATER LEVELS

There are little data on groundwater levels from the early development period of the South Westside Basin. Before groundwater production began, groundwater levels were likely close to the surface within the valley, draining to the Pacific Ocean in the west and to Colma Creek, San Francisco Bay, and other drainages to the east. A report from 1914 (Bartell, 1914) noted that San Bruno produced water from three artesian wells, which, when turned off, overflowed approximately 1 inch above the top of casing. Artesian flow was noted as being maintained through the previous two dry seasons. The same report noted pumping water levels in South San Francisco's nine wells of 55 to 60 ft below ground surface.

Through the early 1940s, groundwater levels remained above sea level in the Daly City area, although in the South San Francisco area groundwater levels were already 100 ft below sea level by that time (Kirker, Chapman & Associates, 1972). Groundwater levels remained relatively stable throughout the basin from the 1970s until the implementation of the ILPS in late 2002, which resulted in rising groundwater levels. Hydrographs present historical groundwater levels on Figures 2.13a-e (locations are presented on Figure 2.14). Current groundwater level conditions are shown in Figure 2.15.

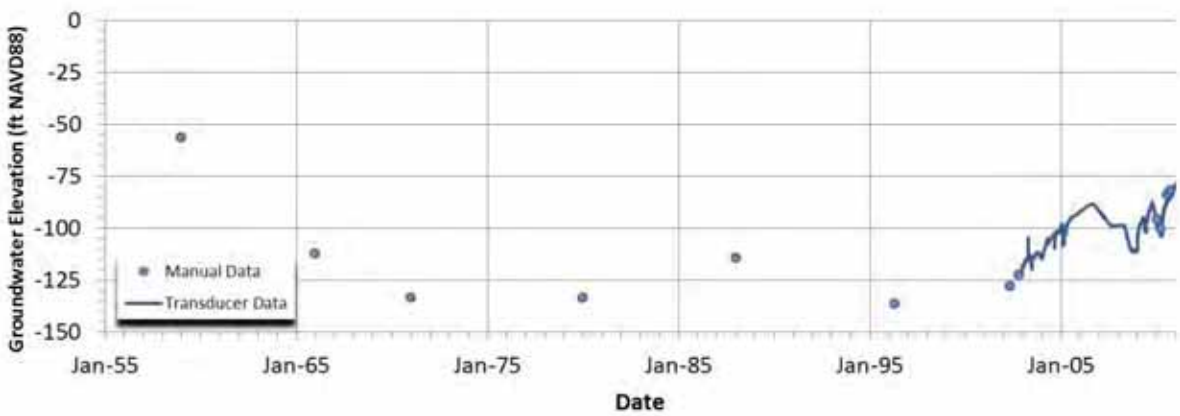



**Figure 2.13a. Historical Groundwater Elevation, DC-8**

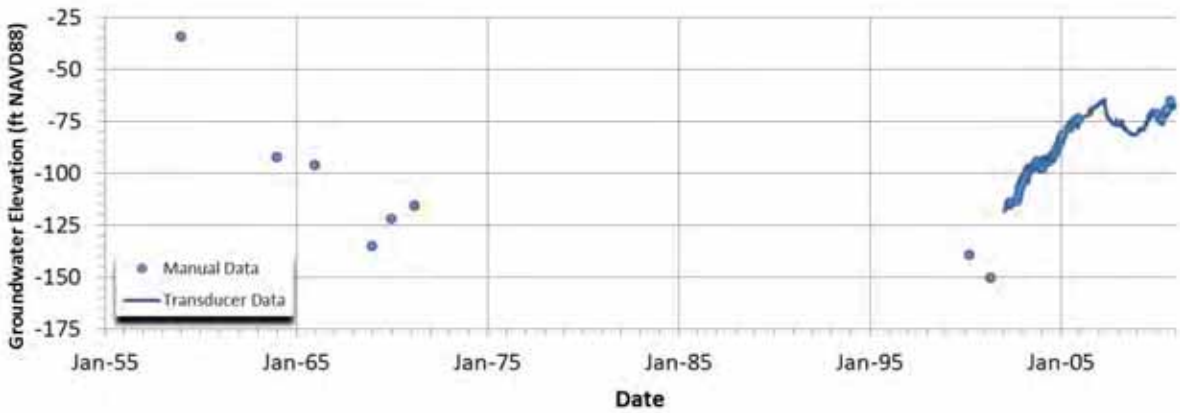



**Figure 2.13b. Historical Groundwater Elevation, DC-1**

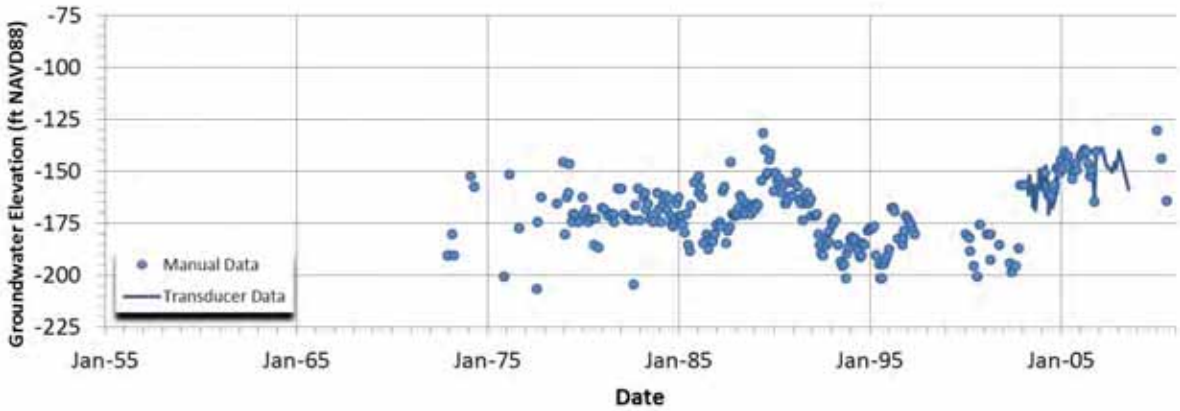



**Figure 2.13c. Historical Groundwater Elevation, SS 1-20**

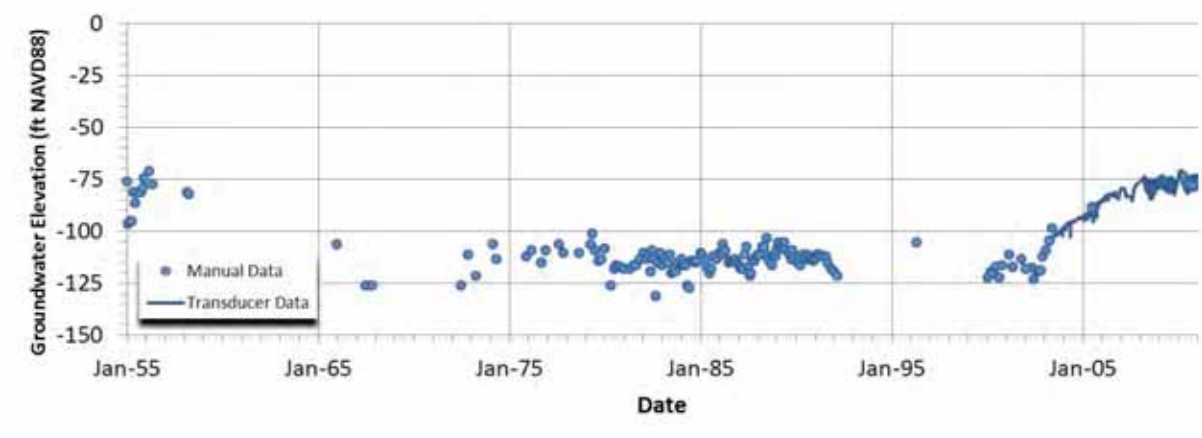



**Figure 2.13d. Historical Groundwater Elevation, SS 1-02**

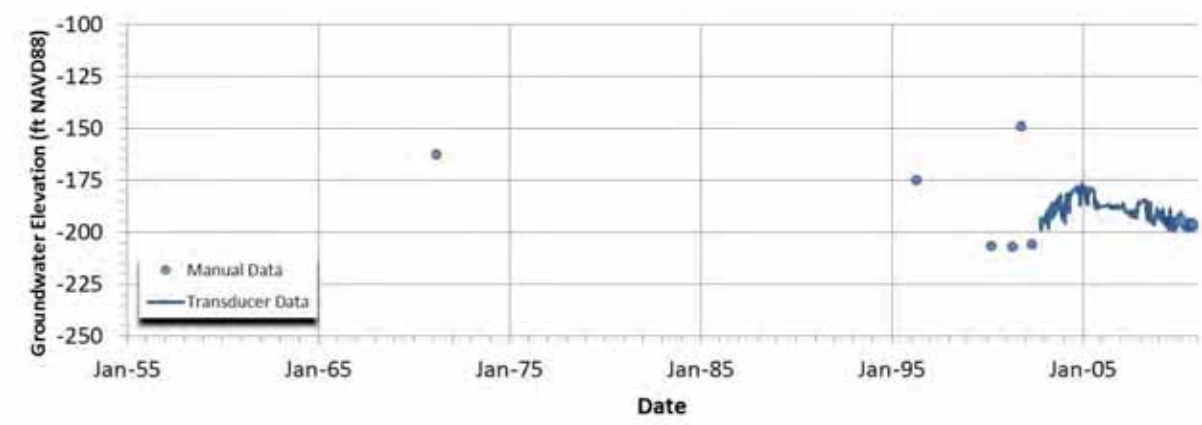
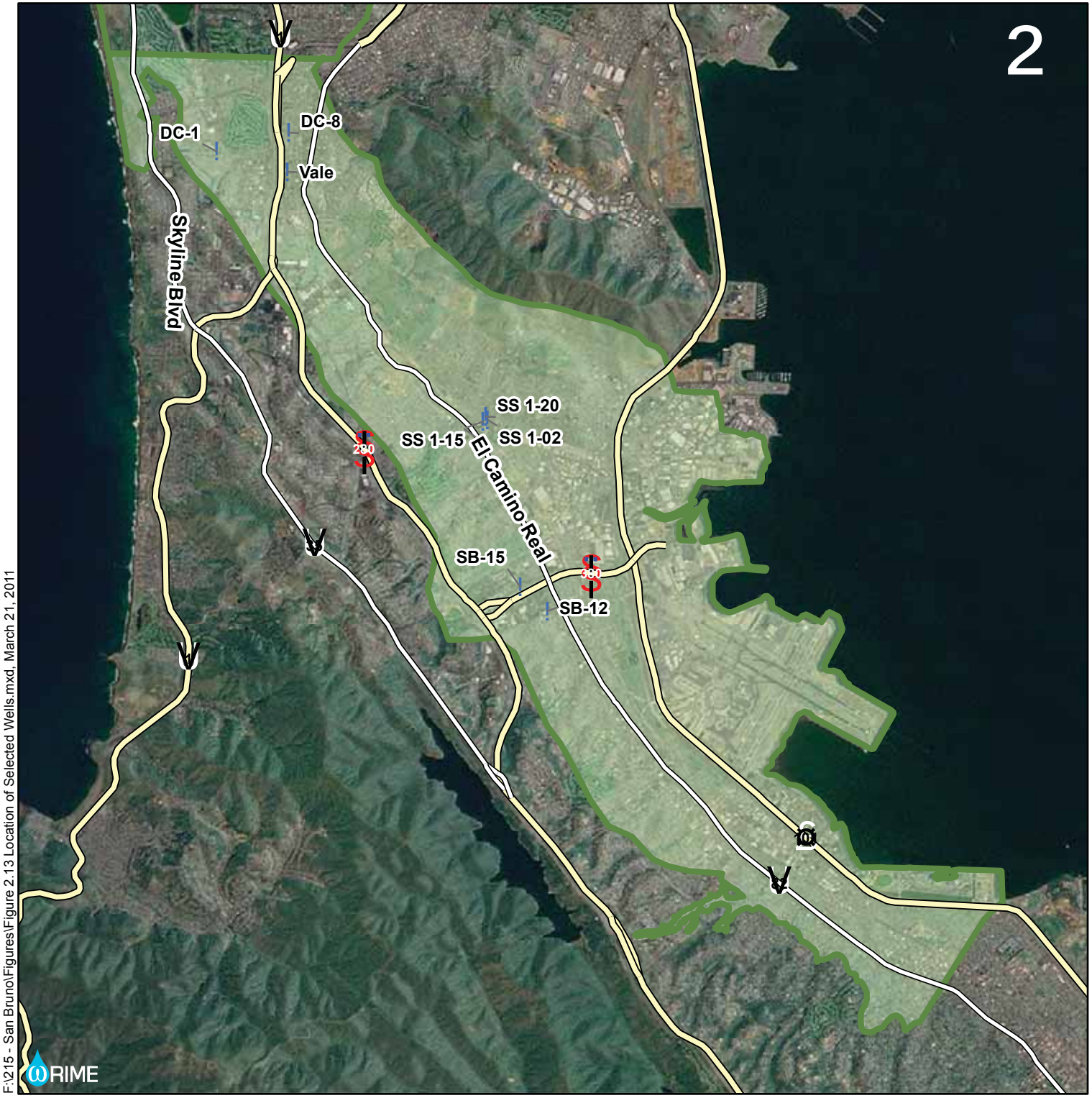



**Figure 2.13e. Historical Groundwater Elevation, SB 12**

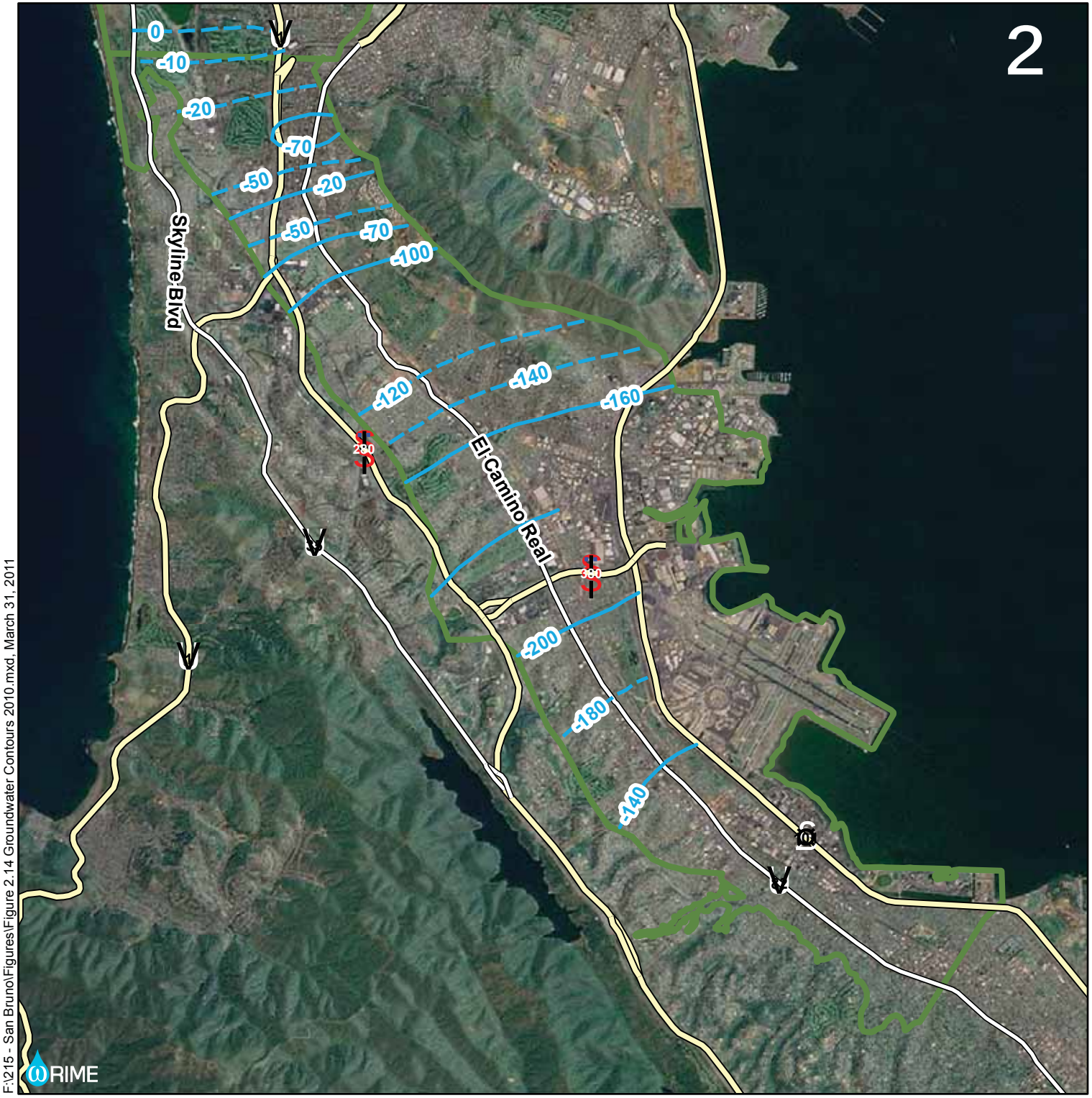



# Figure 2.14
## Location of Selected Wells

**Legend**

- Selected Wells
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles




# Figure 2.15
## Groundwater Elevation Contours Primary Production Aquifer, Fall 2010

**Legend**

- Groundwater Elevation Contour (ft) (dashed where inferred)
- Highways
- Groundwater Basin

0 0.5 1 2 Miles

Source: Groundwater Levels: SFPUC, 2011

F:\215 - San Bruno\Figures\Figure 2.14 Groundwater Contours 2010.mxd, March 31, 2011

RIME

### 2.3.8 GROUNDWATER QUALITY

Groundwater used for water supply in the South Westside Basin is generally good and delivered water meets all state and federal regulations. However, the quality of untreated groundwater in the basin is variable. Lower quality groundwater increases the cost of treatment for use as a drinking water source. Poor quality groundwater may not be economically, technically, or politically feasible for use as a water supply source.

#### 2.3.8.1 Ambient Groundwater Quality

Ambient groundwater quality reflects the general groundwater quality on a regional scale. Most water quality data is available from existing municipal production wells, whose operators maintain a testing schedule to meet the requirements of the California Department of Public Health (DPH). Analysis of ambient water quality was performed based on raw groundwater quality data in a DPH database (2010).

Differences in the general chemistry of groundwater across the basin are shown through the Piper diagram on Figure 2.16. This diagram plots the relative concentrations of cations and anions. Similar waters will plot close to each other; different waters will plot farther apart. The close proximity of the plotted points shows the similarity of water across the South Westside Basin, however, there are noticeable differences between the water of the three agencies.

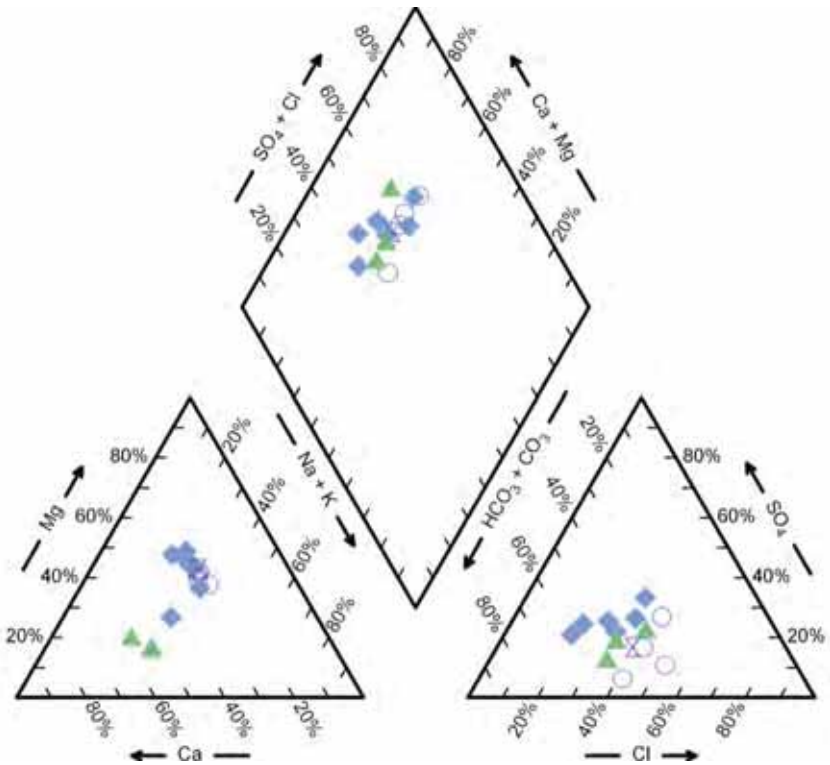
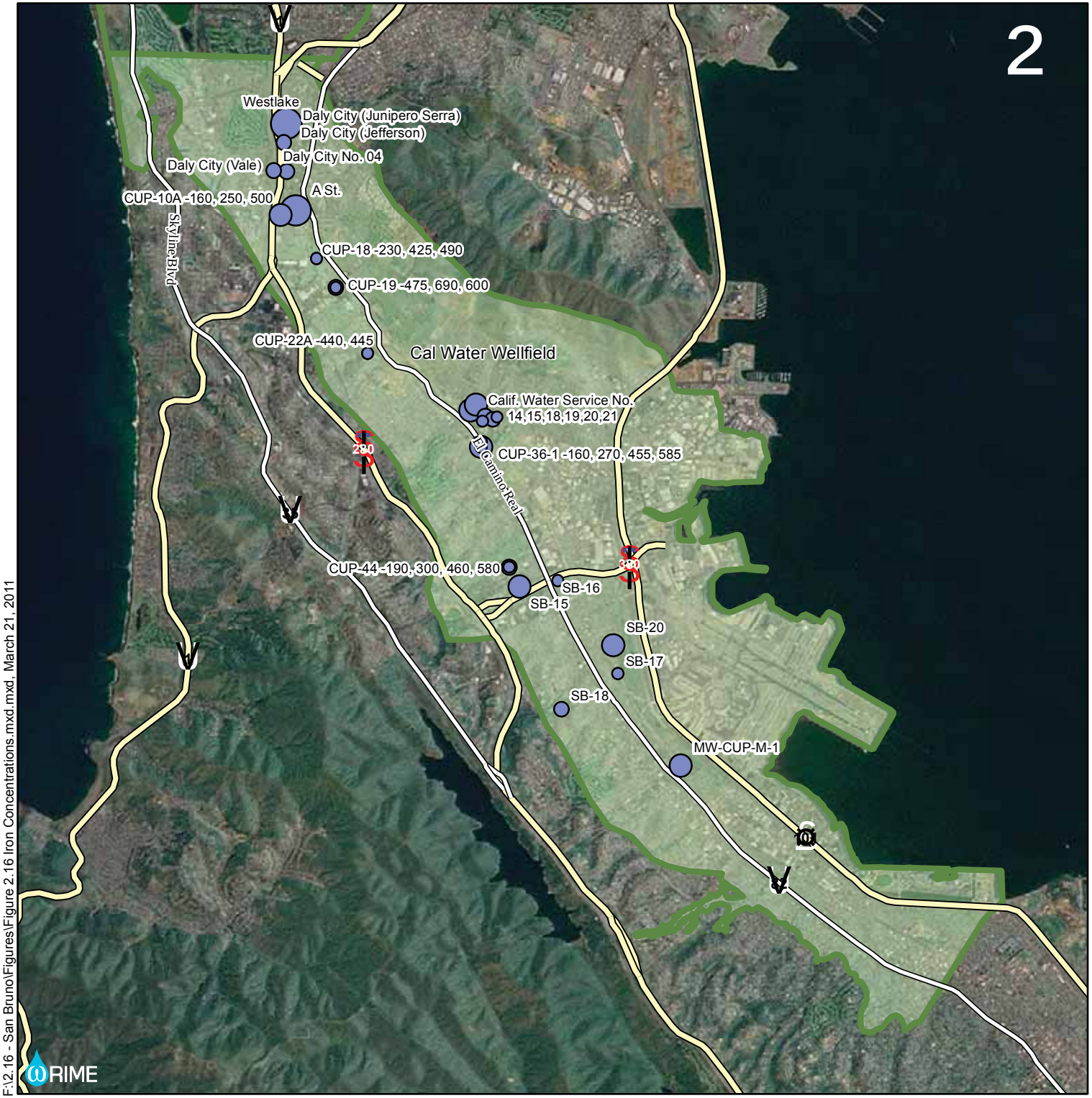



**Figure 2.16. Piper Diagram of General Groundwater Chemistry for Wells Operated by Daly City (open blue), CalWater (filled blue), and San Bruno (filled green)**

Analysis of the most prominent ambient water quality concerns, iron, manganese, nitrate, and total dissolved solids (TDS), was also performed based on raw groundwater quality data contained in the DPH database (2010). While these data are presented along with regulatory standards, it must be noted that a single detection of a contaminant may not indicate contamination. DPH would not consider a single detection of a contaminant, if unconfirmed with a follow-up detection, to be an actual finding. As another example, the presence of a contaminant in raw water does not necessarily mean that the water (and contaminant) was served by the water system to its customers, or, if served, that the contaminant was present at that concentration. Water systems may choose not use certain sources or may treat or blend them prior to service (DPH, 2010). While water containing higher concentrations of iron, manganese, nitrate, and TDS can be used following treatment, it is more economical to use water that does not require treatment.

Iron and manganese do not pose a risk to human health, but are an aesthetic concern for water users. High concentrations of iron and manganese can result in poor tasting water or water that stains fixtures. The source of iron and manganese in groundwater is typically naturally occurring soils and rocks containing iron and manganese. Secondary maximum contaminant levels (SMCL) are enforceable standards established by DPH based on consumer acceptance,

rather than health risk. The SMCL is 300 micrograms per liter (µg/L) for iron and 50 µg/L for manganese. Figures 2.17 and 2.18 show the distribution of iron and manganese, respectively, over the Plan Area based on average 2005-2010 data from DPH. Generally, concentrations of iron and manganese are variable even within short distances. Figures 2.19a-c present historical trends in iron and manganese concentration for selected wells with locations shown in Figure 2.14. These figures show generally stable iron and manganese concentrations. The apparent increase in concentrations in the Vale Well is the result of higher detection limits for the later measurements and does not necessarily indicate increasing concentrations.




# Figure 2.17
## Iron Concentrations in Groundwater

**Legend**

**Concentration (ug/L)**

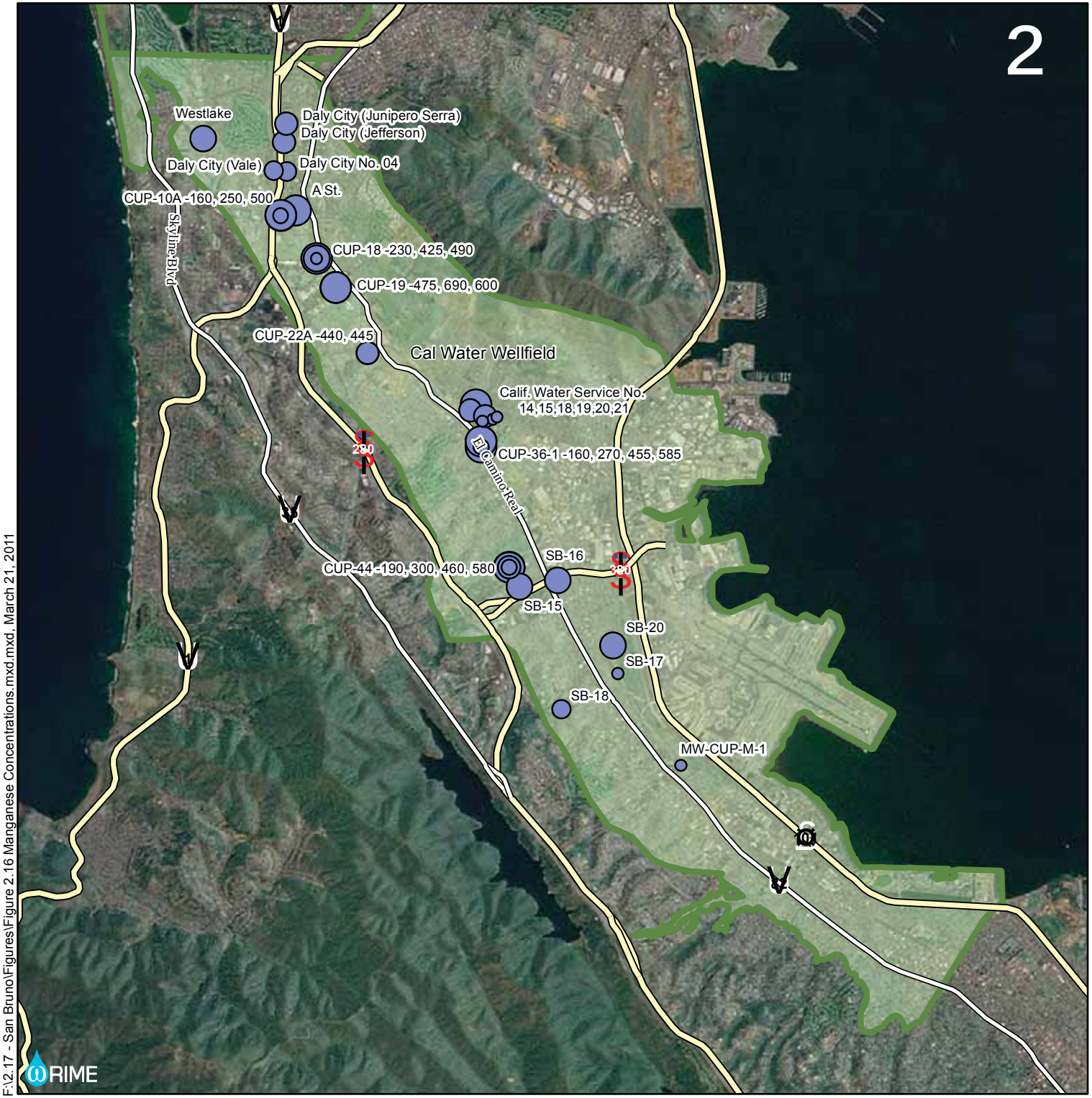
**Iron (SMCL = 300)**

- 0 - 50
- 51 - 100
- 101 - 200
- 201 - 300
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

Source: DPH, 2010

F:\2.16 - San Bruno\Figures\Figure 2.16 Iron Concentrations.mxd.mxd, March 21, 2011




# Figure 2.18
## Manganese Concentrations in Groundwater

**Legend**

**Concentration (ug/L)**

**Manganese (SMCL = 50)**

- 1 - 5
- 5.01 - 10
- 10.01 - 20
- 20.01 - 50
- 50.01 - 100
- 100+
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

Source: DPH, 2010

F:\2.17 - San Bruno\Figures\Figure 2.16 Manganese Concentrations.mxd.mxd, March 21, 2011

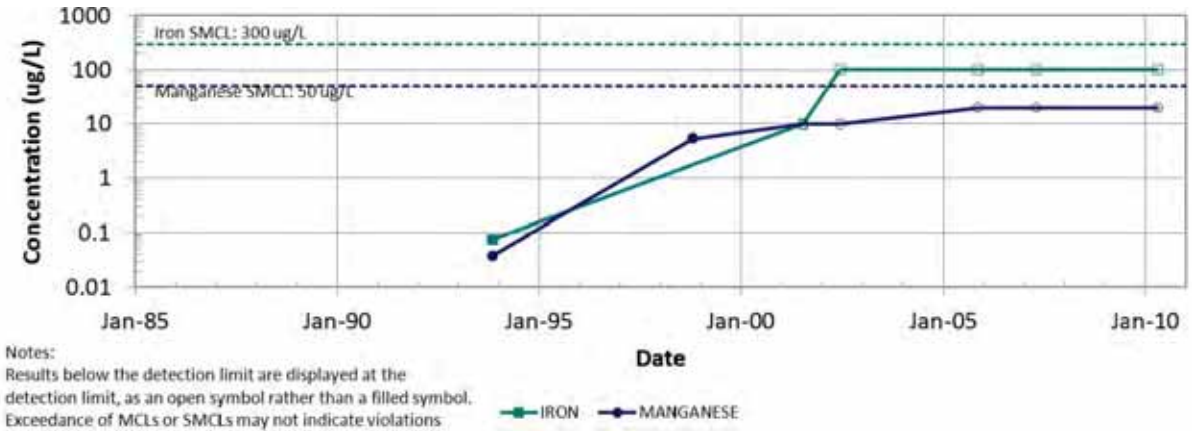



**Figure 2.19a. Historical Iron and Manganese Concentrations, Vale Well**

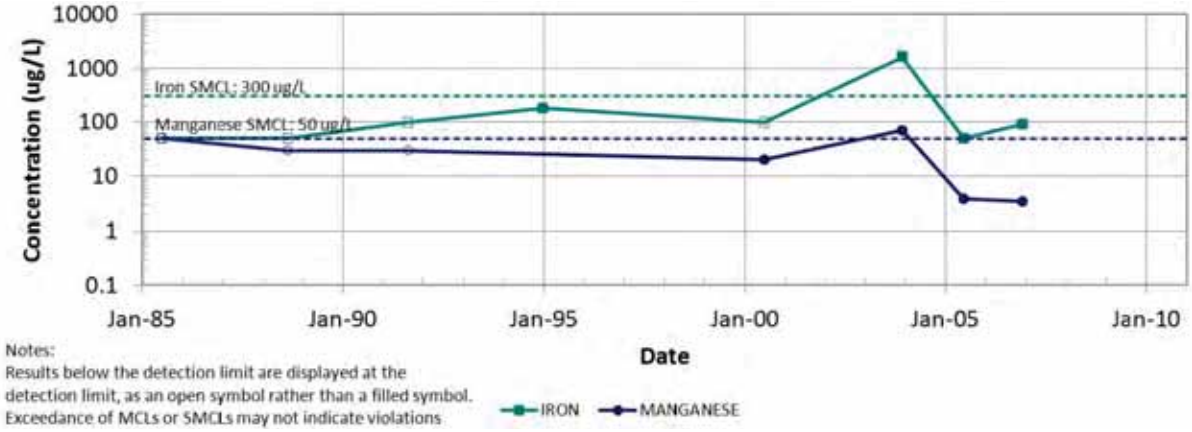



**Figure 2.19b. Historical Iron and Manganese Concentrations, Well 01-15**

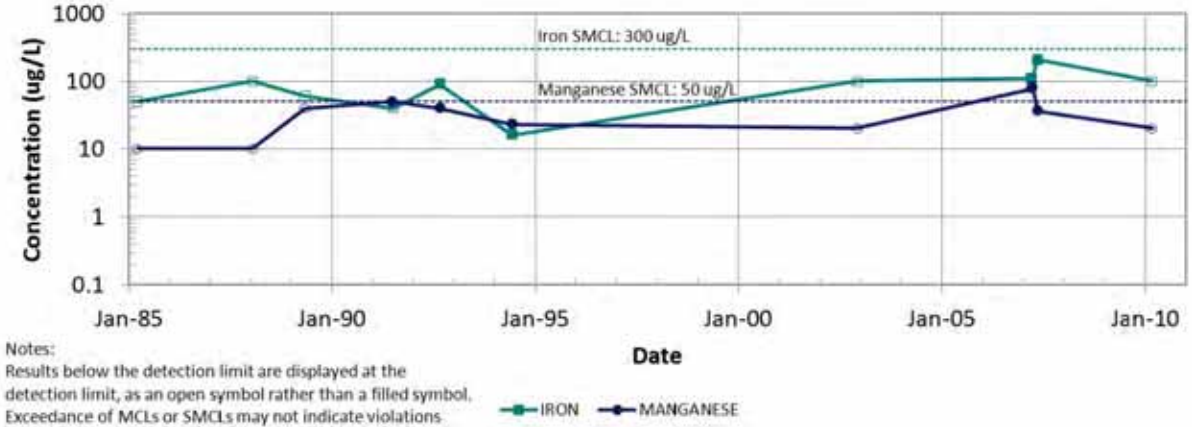



**Figure 2.19c. Historical Iron and Manganese Concentrations, SB-15**

Nitrate in groundwater poses a health risk if concentrations are too high and the water is not properly treated. Low levels of nitrate are naturally occurring, but higher levels are almost always the result of human activity, such as inorganic fertilizer, animal manure, septic systems, and deposition of airborne compounds from industry and automobiles. Maximum contaminant levels (MCL) are enforceable standards established by EPA and DPH to set the highest level of a contaminant allowed in drinking water. MCLs are set as close as feasible to the level below which there is no known or expected health risk using the best available treatment technology and taking cost into consideration (EPA, 2009). The MCL for nitrate is 45 milligrams per liter (mg/L) (as $NO_3$). Figure 2.20 shows the distribution of nitrate over the Plan Area based on average 2005-2010 data from DPH. Generally, nitrate concentrations are highest in the central portion of the Plan Area, South San Francisco, and lowest in the southern portion of the South Westside Basin, San Bruno. Some of this trend is due to the depth of the wells as the wells in South San Francisco are generally shallower than the other municipal wells in the basin and thus are more likely to show influences of contaminating activities at the surface. Figures 2.21a-c present historical trends in nitrate concentrations for selected wells with locations shown in Figure 2.14.

# Figure 2.20

## Nitrate as $NO_3$ Concentrations in Groundwater

**Legend**

**Concentration (mg/L)**

**$NO_3$ (MCL = 45)**

- 0.1 - 1.5
- 1.6 - 15
- 16 - 30
- 31 - 45
- 46 - 80
- Highways
- Groundwater Basin
- Plan Area

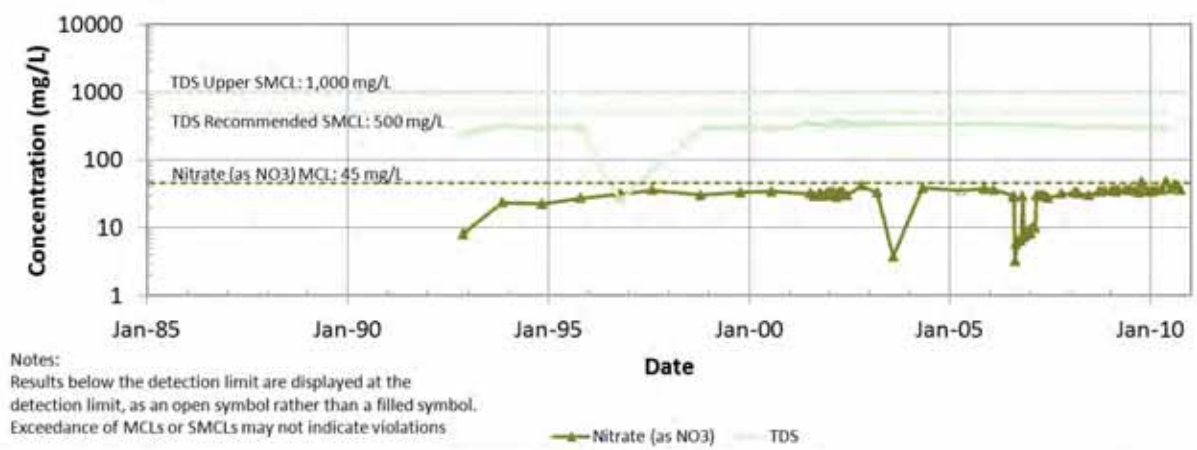



**Figure 2.21a. Historical Nitrate and TDS Concentrations, Vale Well**

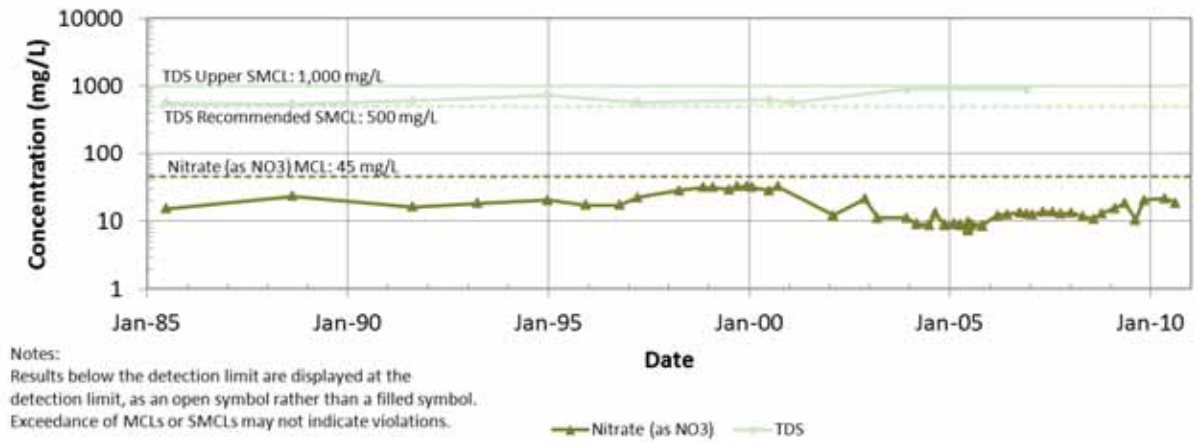



**Figure 2.21b. Historical Nitrate and TDS Concentrations, Well 01-15**

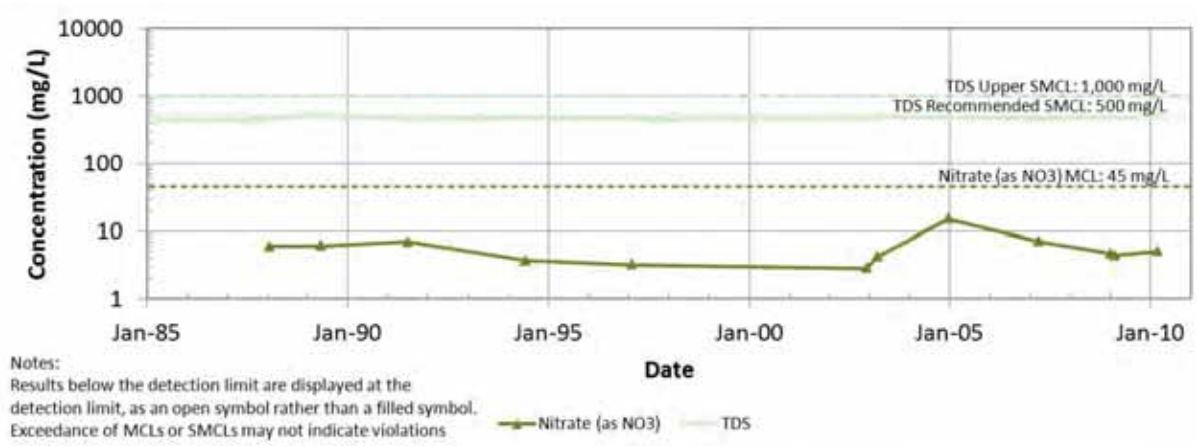



**Figure 2.21c. Historical Nitrate and TDS Concentrations, SB-15**

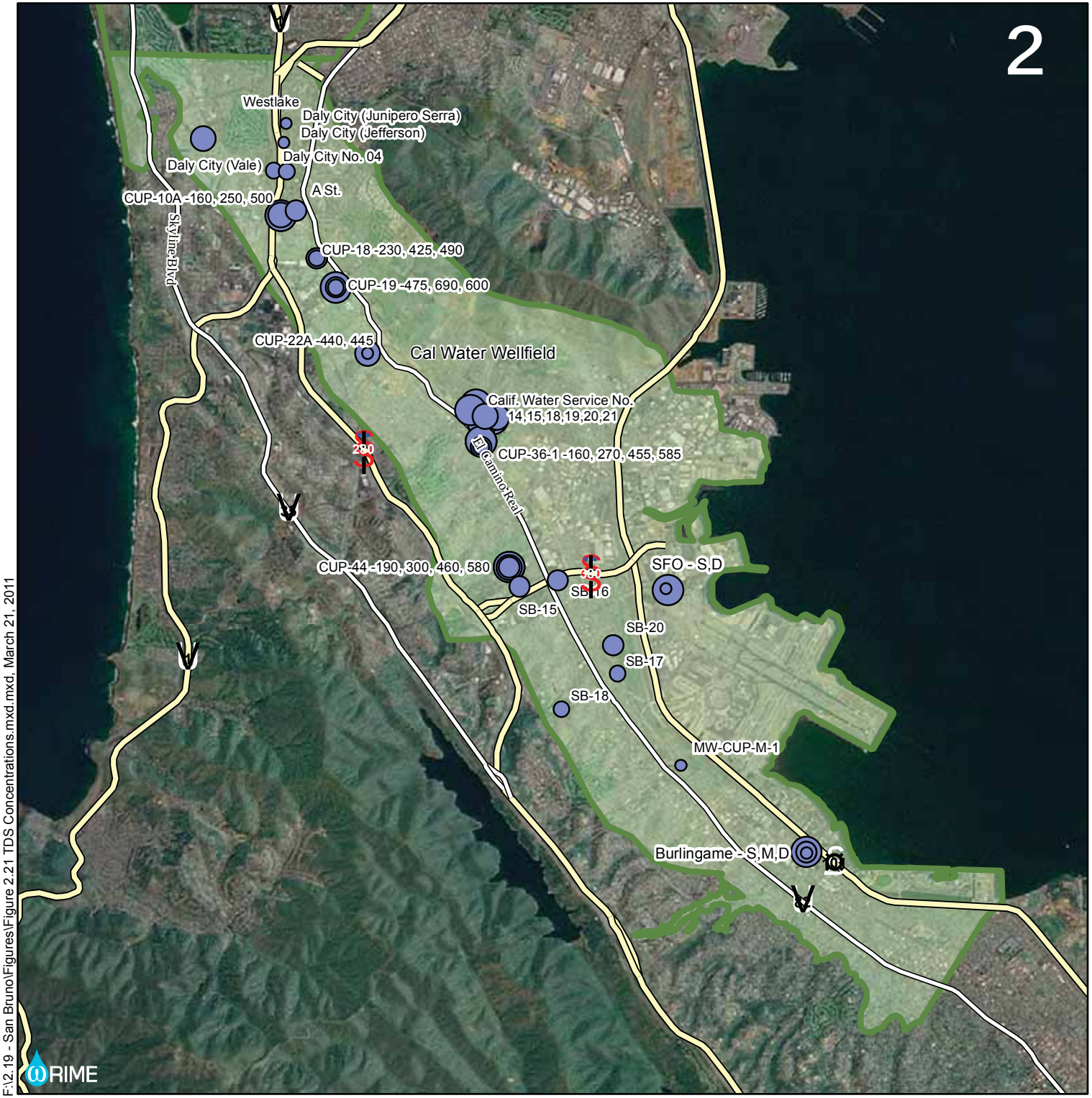
TDS do not pose a risk to health, but are an aesthetic concern for water users. High concentrations of TDS can cause scale buildup or hard water that is poor tasting. As TDS is a combined measurement of all dissolved compounds in the water, there are many naturally occurring sources as well as sources resulting from human activities. Irrigation often increases TDS as irrigation water collects salts that contribute to TDS as they percolate to the groundwater. This groundwater may be pumped back to the surface and used for irrigation again, further increasing TDS. Allowing water to leave the system or treating the water at the surface can break this cycle. Seawater intrusion can rapidly increase TDS in an aquifer. TDS has the following three SMCLs:

- Recommended: 500 mg/L. Constituent concentrations lower than the recommended contaminant level are desirable for a higher degree of consumer acceptance.
- Upper: 1000 mg/L. Constituent concentrations ranging to the upper contaminant level are acceptable if it is neither reasonable nor feasible to provide more suitable water.
- Short term: 1500 mg/L. Constituent concentrations ranging to the short term contaminant level are acceptable only for existing community water systems on a temporary basis pending construction of treatment facilities or development of acceptable new water sources. (DPH, 2009)

Figure 2.22 shows the distribution of TDS over the Plan Area based on average 2005-2010 data from DPH. Generally, TDS concentrations are highest in the central portion of the Plan Area, South San Francisco, and lowest in the northern portion of the South Westside Basin, Daly City. Some of this trend is due to the depth of the wells as the wells in South San Francisco are generally shallower than the other municipal wells in the basin and thus are more likely to show influences of contaminating activities at the surface. Figure 2.21a-c presents historical trends in TDS concentrations for selected wells with locations presented on Figure 2.14.

#### 2.3.8.2 Point Source Contamination

In addition to ambient water quality concerns, contaminated groundwater from point sources can quickly remove wells from service and thus requires close coordination with regulatory agencies such as EPA, RWQCB, the California Department of Toxic Substances Control (DTSC), and local oversight programs, including San Mateo County Groundwater Protection Program. Based on a search of DTSC's Envirostor database and the Water Board's GeoTracker database, the sites summarized on Table 2.4 have been identified as federal, state, or voluntary cleanup sites potentially affecting the aquifer used for drinking water supply.




# Figure 2.22
## TDS Concentrations in Groundwater

**Legend**

**Concentration (mg/L)**

**TDS (SMCL = 500/1000/1500)**

- 250 - 300
- 301 - 400
- 401 - 500
- 501 - 600
- 600 +
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

Source: DPH, 2010

F:\2.19 - San Bruno\Figures\Figure 2.21 TDS Concentrations.mxd.mxd, March 21, 2011

**Table 2.4**
**Open Contaminated Sites Potentially Impacting the Aquifer Used for Drinking Water Supply**

| Name | Address | ID | Potential Contaminants of Concern | Lead Agency |
|---|---|---|---|---|
| ARCO #0465 | 151 Southgate Avenue, Daly City | T0608100027 | Benzene, Toluene, Xylene, Fuel Oxygenates, Gasoline | County of San Mateo Health Services Agency |
| Chevron 9-6982 | 892 John Daly Blvd, Daly City | T0608100148 | Gasoline | County of San Mateo Health Services Agency |
| Agbayani Construction | 88 Dixon Ct., Daly City | T10000002674 | Tetrachloroethylene (PCE), Trichloroethylene (TCE), Vinyl chloride | County of San Mateo Health Services Agency |
| Gas & Wash Partners | 247 87th St., Daly City | T10000003031 | Benzene, Toluene, Xylene, Gasoline | County of San Mateo Health Services Agency |
| United Airlines Maintenance Center | San Francisco International Airport, South San Francisco | SL0608106162 | Solvents | RWQCB |
| Chevron 9-5584, former | 1770 El Camino Real, San Bruno | T0608179897 | Gasoline | County of San Mateo Health Services Agency |
| 1245 Montgomery Ave | 1245 Montgomery Ave., San Bruno | SL0608187730 | Benzene, Other Solvent or Non-Petroleum Hydrocarbon, TCE | RWQCB |

As with all urban areas in the state, numerous Leaking Underground Fuel Tanks and Spills Leaks Investigation and Cleanup sites are present in the South Westside Basin and are being monitored and/or remediated under the regulatory lead of the RWQCB or the local oversight program. Leaking underground fuel tanks are typically at gas stations, while spills leaks investigation and cleanup sites have a variety of sources, but all involve hazardous wastes that have impacted soil and/or groundwater.

Many, but not all, of these point-source contaminants occur at the surface and tend to remain near the surface due to the chemical properties of the contaminants and the geologic conditions that slow the migration of these contaminants into the deep aquifer used by municipal groundwater producers in the basin and most private producers. Detailed coordination is required to ensure that corrective action on point sources is sufficient to protect groundwater quality. A map of known, active contaminated sites that have affected or could potentially affect groundwater, soils, or other environmental media is shown in Figure 2.23, as detailed by the Water Board's GeoTracker database system. Sites on Figure 2.23 are classified as follows:

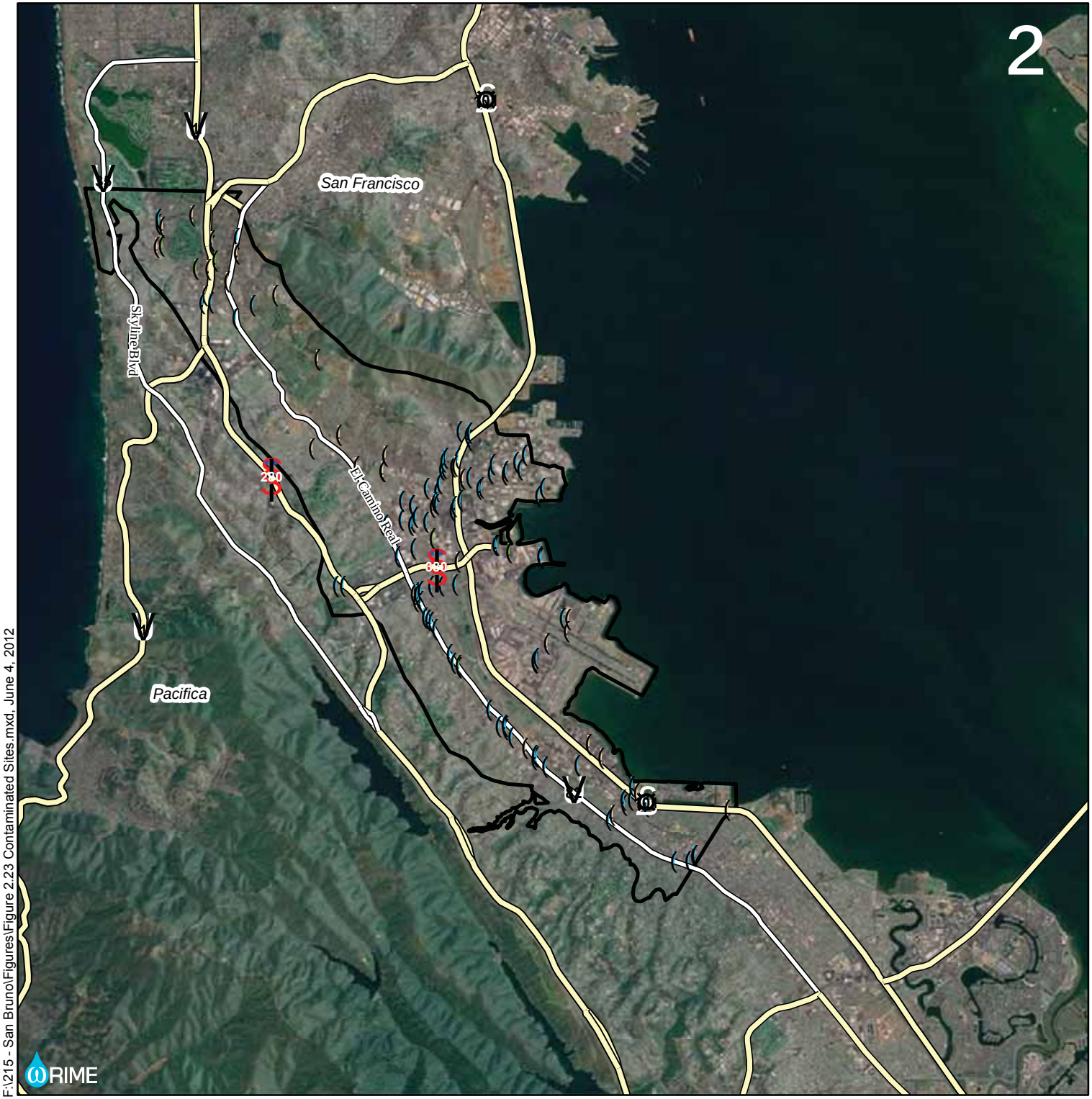
- **Drinking Water Aquifer:** Sites listed on GeoTracker as Potentially Affecting Aquifer Used for Drinking Water Supply or Potentially Affecting Well Used for Drinking Water Supply
- **Shallow Groundwater:** Sites listed on GeoTracker as Potentially Affecting Other Groundwater (Uses Other Than Drinking Water)
- **Other Impact:** Sites listed on GeoTracker as Potentially Affecting Indoor Air, Sediments, Soils, Soil Vapor, Surface Water, or Under Investigation

Note that, in the South Westside Basin, only the United Airlines Maintenance Facility is listed as Potentially Affecting Well Used for Drinking Water Supply, and this site, like many others, is extensively monitored and actively undergoing remediation activities.

Groundwater here includes shallow, perched groundwater not directly used for water supply (Other Groundwater). The distinction between shallow, perched groundwater not directly used for water supply and groundwater used for drinking water supply is to some degree based on professional judgment by the preparers of the GeoTracker system; Section 5.4.3 contains recommendations for coordination with regulatory agencies to improve the accuracy and usefulness of these classifications for regional planning and public outreach.

### 2.3.9 DESALTER INFRASTRUCTURE

There is currently no desalination infrastructure in the South Westside Basin.




# Figure 2.23
## Contaminated Sites

**Legend**

**Contaminated Sites by Potential Impact**

- Drinking Water Aquifer
- Shallow Groundwater
- Other Impact
- Highways
- Plan Area

0 0.5 1 2 Miles

Source: Water Board, 2010

F:\215 - San Bruno\Figures\Figure 2.23 Contaminated Sites.mxd, June 4, 2012

### 2.3.10 GROUNDWATER/SURFACE WATER INTERACTION

Interaction between groundwater and surface water in the Plan Area is limited due to the significant depth to groundwater used for water supply, numerous clay layers that slow vertical migration of water through the subsurface, and the presence of only minor surface water features, such as Colma Creek, which are often channelized. The perched water table above the upper clay units interacts with local surface water courses, such as Colma Creek and smaller creeks. Groundwater tends to seep into the surface water courses near the Bay and the surface water recharges the groundwater at higher elevations. The perched aquifer, which is not used as a water supply, slowly recharges the deeper aquifer through the clay layers.

Lake Merced is an important surface water feature just north of the Plan Area. The draft North Westside Basin GWMP addresses issues with groundwater interaction with Lake Merced.

### 2.3.11 SUBSIDENCE AND LIQUEFACTION

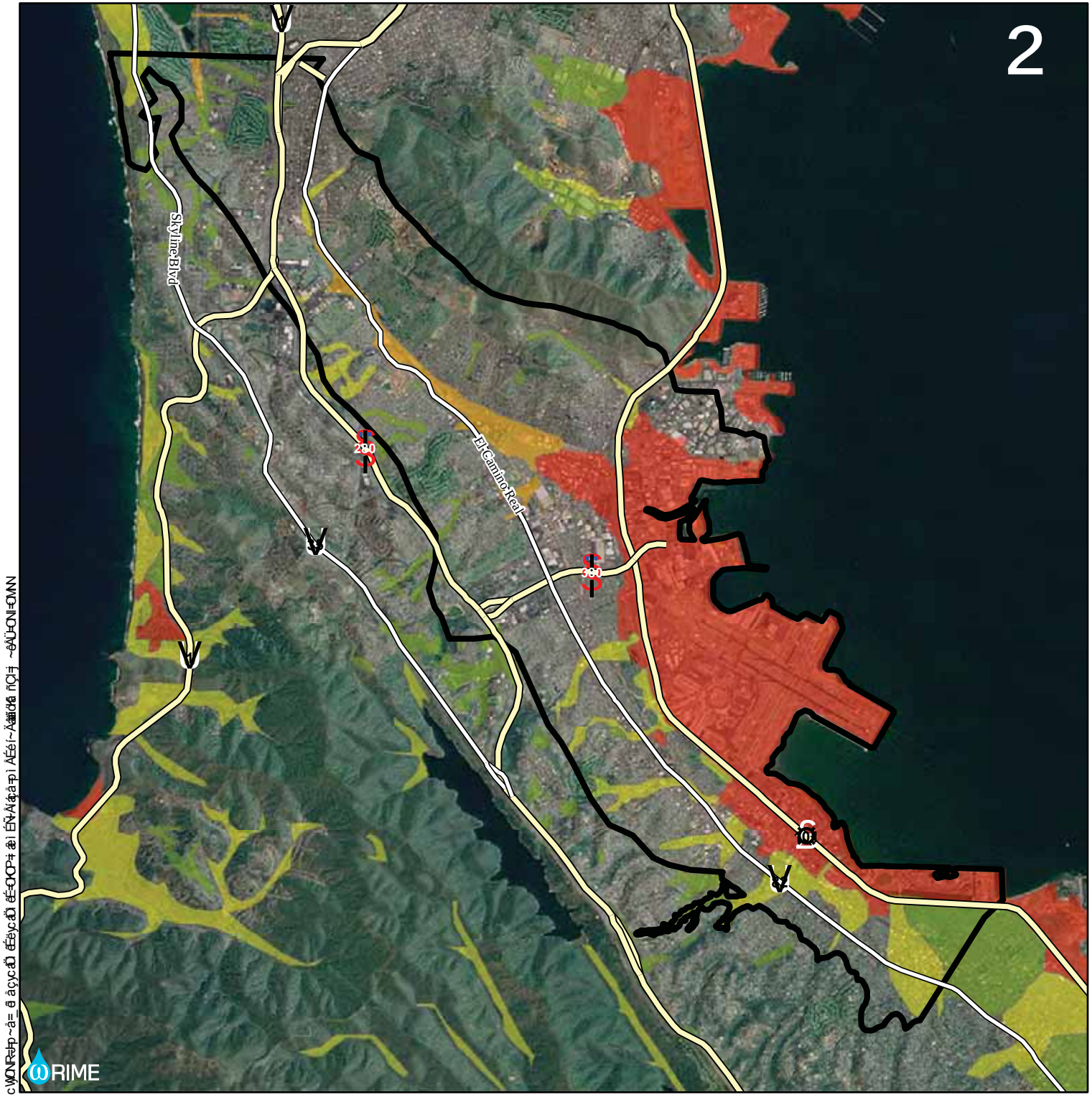
Subsidence and liquefaction are both influenced by changes in groundwater levels. Low groundwater levels can contribute to subsidence while high groundwater levels can contribute to liquefaction.

Land subsidence here refers to the lowering of the ground surface as a result of groundwater level changes, not tectonic changes. Aquifers, particularly the fine-grained materials within or between the aquifers, are compressible. If groundwater levels decrease as a result of pumping or other causes, water may be released from beds of clay or silt around the coarser materials that are the primary source of water in the aquifer. The release of water from the beds of clay and silt reduces the water pressure, resulting in a loss of support for the clay and silt beds. Because these beds are compressible, they compact (become thinner), and the effects are seen as a lowering of the land surface (Leake, 2004). Whether or not subsidence through compression occurs in an area depends on groundwater levels (groundwater levels must decline) and on materials (sufficient compressible clays and silts must be present).

There are no available records of historical subsidence in the South Westside Basin. Significant studies have been performed to the south in the Santa Clara Valley, due to extensive subsidence in that area. Those studies show that the extent of subsidence in the area is focused on Santa Clara, where land subsided 8 ft from 1934 to 1967. To the north, subsidence is more limited, with less than 1 foot of subsidence in the Palo Alto area and approximately an inch of subsidence in the Redwood City area (Poland and Ireland, 1988). Studies have not been performed farther north, likely due to a lack of evidence of active subsidence.

The Plan Area has potential for liquefaction, where earthquake-induced shaking can cause a loss of soil strength, resulting in the inability of soils to support structures. This can occur in saturated soils where the shaking causes an increase in water pressure to the point where the soil particles can move easily within the soil-water matrix. Areas along San Francisco Bay have

been rated as having "very high" susceptibility to liquefaction by the USGS (Figure 2.24; Witter et al., 2006). These areas are underlain by artificial fill over Bay Mud. While only covering the bayshore area, artificial fill over Bay Mud accounted for 50 percent of all historical liquefaction occurrences in the nine-county San Francisco Bay area and about 80 percent of those liquefaction occurrences resulted from the Loma Prieta earthquake (Witter et al., 2006). In the South Westside Basin, these units have a perched water table that is not influenced by groundwater production. Areas with high to moderate susceptibility to liquefaction include areas along current or former creeks, particularly Colma Creek. Other areas have low or very low susceptibility to liquefaction.




# Figure 2.24
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pì ÅÉéí~Äáäáó

**Legend**

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- mäåå=ÅêÉ~

**Liquefaction**

- s ÉêóòÉ áÜ
- e áÜ
- j çÇÉê~íÉ
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M MKR N O
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pçìêÅÉW
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t áíÉå=Éí=å=OMMS

cWONRÅp~å= ã åçyçÜ ÉëyçÜ ÉÉ=OKOP= æì ÉÑÅíçå=pì ÅÉéí~Äáäáó ñÇ= ~ÅÜ=ONI=OMNN

### 2.3.12 GROUNDWATER MONITORING

Current South Westside Basin-wide groundwater monitoring is coordinated through the agencies throughout the Plan Area and is presented in annual groundwater monitoring reports prepared by SFPUC since 2005. The reports include details on semi-annual monitoring of groundwater production, level, and quality data as well as data on Lake Merced water levels. Prior to that date, San Mateo County maintained a semiannual groundwater monitoring program that included static water level and water quality monitoring. San Mateo County's reports covered the period from 2000 through 2003. The individual agencies also maintain long-term records of production, water levels, and water quality for their facilities.

#### 2.3.12.1 Groundwater Level Monitoring

Groundwater level monitoring for use in the regional annual groundwater reports includes both dedicated monitoring wells and inactive production wells. Dedicated monitoring wells include wells installed as part of seawater intrusion monitoring, groundwater/surface water interaction monitoring, and as part of the GSR. Measurements are taken manually on a quarterly or semiannual basis in some wells, and daily through the use of electronic pressure transducers in other wells (SFPUC, 2010a). Monitoring wells measured in the South Westside Basin include the following:

- Daly City Area
  - LMMW-6D
  - Thornton Beach MW 225, 360, 670
  - DC-1 (Westlake 1)
  - Park Plaza MW460, 620
  - DC-8
  - CUP 10A MW160, 250, 500, 710
- Colma Area
  - CUP 18 MW230, 425, 490, 660
  - CUP 19 MW180, 475, 600, 690
  - CUP 23 MW230, 440, 515, 600
- South San Francisco Area
  - CUP 22A MW140, 290, 440, 545
  - SS 1-02
  - SS 1-20
  - CUP 36 MW160, 270, 455, 585
  - SSFLP MW120, 220, 440, 520
- San Bruno Area
  - CUP 44-1 MW190, 300, 460, 580
  - SB-12 (Elm Ave)

    - UAL-13C, 13D
    - SFO-S, -D
- Millbrae Area
    - CUP-M-1
- Burlingame Area
    - Burlingame-S, -M, -D

Additionally, groundwater levels are also monitored by the individual agencies, and include measurements of static or dynamic water levels, depending on the operational status of the well.

#### 2.3.12.2 Groundwater Production Monitoring

Groundwater production data are summarized for the water agencies and for metered users of recycled water in SFPUC's annual reports. Other irrigation production is estimated and also presented in the report.

#### 2.3.12.3 Groundwater Quality Monitoring

Groundwater quality is monitored for both regional analysis in SFPUC annual reports and to meet the DPH's requirements specified in Title 22 of the California Code of Regulations.

Individual agencies test the water quality in the active municipal productions wells on a schedule to meet DPH requirements and to ensure safe drinking water for their customers.

Water quality data are collected for use in SFPUC's annual reports, either specifically for the program or as part of the testing for DPH requirements or other programs such as seawater intrusion monitoring or monitoring for use in the proposed GSR.

## 2.4 IMPORTED WATER

Imported water in the South Westside Basin is supplied by SFPUC, which operates the Hetch Hetchy system. Details of the system are provided in the following two paragraphs, based on SFPUC's *Annual Water Quality Report* (SFPUC, 2010b). The *Annual Water Quality Report* is included in Appendix B and contains more detailed information on chemical constituents in the water supply.

The major sources of imported water are from the SFPUC and include Hetch Hetchy Reservoir and the local watersheds. Hetch Hetchy is located in the well-protected Sierra region and meets all federal and state criteria for watershed protection. Based on SFPUC's disinfection treatment practice, extensive bacteriological quality monitoring, and high operational standards, the state has granted the Hetch Hetchy water source a filtration exemption. In other words, the source is so clean and protected that SFPUC is not required to filter water from Hetch Hetchy Reservoir.

Hetch Hetchy Reservoir water is provided by SFPUC to Daly City, San Bruno, Millbrae, Burlingame, and to the Golden Gate National Cemetery. SFPUC provides water to CalWater from sources in accordance with the Raker Act.

Hetch Hetchy water is supplemented with surface water from two local watersheds. Rainfall and runoff collected from the Alameda Watershed, which spans more than 35,000 acres in Alameda and Santa Clara Counties, are collected in the Calaveras and San Antonio reservoirs. Prior to distribution, the water from these reservoirs is treated at the Sunol Valley Water Treatment Plant. Treatment processes include coagulation, flocculation, sedimentation, filtration, and disinfection. Fluoridation, chloramination, and corrosion control treatment are provided for the combined Hetch Hetchy and Sunol Valley Water Treatment Plant water at the Sunol Chloramination and Fluoridation Facilities. Rainfall and runoff captured in the 23,000-acre Peninsula Watershed in San Mateo County are stored in reservoirs, including Crystal Springs (Lower and Upper), San Andreas, and Pilarcitos. The water from these reservoirs is treated at Harry Tracy Water Treatment Plant, where treatment processes include ozonation, coagulation, flocculation, filtration, disinfection, fluoridation, corrosion control treatment, and chloramination.

Daly City has 10 SFPUC pipeline connections called turnouts. They are connected to the Sunset, San Andreas #2, and Crystal Springs #2 pipelines and can supply approximately 30.89 mgd at a rate of approximately 21,400 gallons per minute (Daly City, 2005).

CalWater - South San Francisco District receives water from 12 connections at 11 SFPUC turnouts and groundwater from eight wells. Portions of CalWater's distribution system rely solely on SFPUC imported surface water, while others use groundwater from CalWater's wellfield for all or a portion of their water supply (MWH, 2007).

San Bruno has four connections to SFPUC's water supply system and one connection to North Coast County Water District (NCCWD). During normal conditions, water from SFPUC is transported through the San Andreas Pipeline from the Harry Tracy Water Treatment Plant near Crystal Springs Reservoir and delivered to three of San Bruno's turnouts. San Bruno also has a connection to SFPUC's 60-inch diameter Sunset Supply Pipeline, which was recently fitted with a pressure reducing valve, and is currently used only for fireflow and other emergency situations. The Sunset Supply Pipeline can deliver water directly from SFPUC's Hetch Hetchy System. San Bruno's connection from the NCCWD extends from SFPUC's Harry Tracy Water Treatment Plant to Crystal Springs Terrace. San Bruno purchases treated water from the NCCWD to serve the Crystal Springs Terrace area. This connection is equipped with a pressure reducing valve at Regulating Station 1 (EKI, 2007; Brown and Caldwell, 2001).

Millbrae receives water from five SFPUC turnouts. The Harry Tracy Water Treatment Plant supplies filtered water in the higher elevations, while the Crystal Springs #2 and #3 pipelines deliver water to the lower elevations (BAWSCA, 2009).

Burlingame receives water from six metered turnouts connected to SFPUC's Sunset Supply Pipeline and Crystal Springs Pipelines #2 and #3 (EKI, 2005).

## 2.5 RECYCLED WATER

Wastewater collection, treatment, and disposal performed by the local agencies is described in the following sections. Of these agencies, the North San Mateo County Sanitation District also includes treatment and distribution of recycled water as part of its wastewater activities.

### 2.5.1 TREATMENT PLANTS

Wastewater treatment plants in the South Westside Basin include:

- North San Mateo County Sanitation District's (NSMCSD) treatment plant, which includes a recycled water facility permitted to distribute 2.77 mgd of tertiary recycled water.
- San Bruno and South San Francisco's South San Francisco/San Bruno Water Quality Control Plant
- Burlingame's Wastewater Treatment Facility
- City of Millbrae's Water Pollution Control Plant

#### 2.5.1.1 North San Mateo County Sanitation District Treatment Plant

The NSMCSD is a subsidiary of the City of Daly City and owns and operates a treatment plant at the southern end of Westlake Park in Daly City. The plant was expanded in 1989 to a capacity of 10.3 mgd. The NSMCSD provides collection, treatment and disposal for the majority of the residents of Daly City, along with Broadmoor Village, a portion of Colma, the Westborough County Water District in South San Francisco, and the San Francisco County Jail in San Bruno (Daly City, 2009).

In 2003, NSMCSD constructed facilities at its wastewater treatment plant to produce recycled water. The plant has the capacity and permits for production of approximately 2.77 mgd of tertiary-treated recycled water (SFPUC, 2008) and began delivery in 2004 to irrigation users.

#### 2.5.1.2 South San Francisco/San Bruno Water Quality Control Plant

The South San Francisco/San Bruno Water Quality Control Plant was constructed in the early 1970s and is jointly operated by the cities of South San Francisco and San Bruno. The sewage of both cities is treated, as is wastewater from a portion of Colma and the Serramonte portion of Daly City. The Westborough Water District coordinates sewage treatment for the Westborough portion of South San Francisco under contract with Daly City.

The current design capacity of the treatment plant is 13 mgd with an actual capacity of 9 mgd average dry weather flow. A plant expansion, begun in the fall of 1998, increased the dry-weather operational capacity to 13 mgd. The expansion added three new primary clarifiers, additional secondary clarifiers, and removed obsolete equipment (South San Francisco, 2009).

#### 2.5.1.3 City of Millbrae Water Pollution Control Plant

The City of Millbrae provides wastewater service to approximately 5,928 residential and 495 commercial customers. The City's Sanitation System has two components: collection and treatment/disposal. Wastewater is collected via a network of about 57 miles of sewer pipelines and two wastewater pumping stations, and then transported to the City's Water Pollution Control Plant for treatment and disposal (Millbrae, 2009a). In October 2009, Millbrae began a refurbishment of the Water Pollution Control Plant to improve treatment capabilities and minimize sanitary sewer overflows that can occur during stormy weather. This project will add a 1.2 million gallon flow equalization tank to retain the extra water that flows into the treatment plant during storms (Millbrae, 2009b).

#### 2.5.1.4 Burlingame Wastewater Treatment Facility

The wastewater treatment facility at 1103 Airport Boulevard became operational during 1935-36. The facility has a designed capacity to treat 5.5 mgd of wastewater and 16 mgd during wet weather (Burlingame, 2009).

### 2.5.2 Recycled Water Infrastructure and Users

Existing recycled water infrastructure and users are in the Daly City / Lake Merced area. Recycled water for non-potable (non-drinkable) uses such as irrigation is encouraged to conserve drinking water supplies. Installation of recycled water pipelines in the NSMCSD began in the mid-1980s when water or sewer projects were constructed. As discussed in Section 2.5.1.1, NSMCSD's treatment plant has the capacity and permits for production of 2.77 mgd of recycled water.

Today, the system is used to irrigate landscaped medians in the Westlake area and golf courses at Olympic Club, Lake Merced Golf Club, and San Francisco Golf Club. These customers use an average of less than 1 mgd of recycled water. Construction is underway to expand the recycled water infrastructure and user base to include irrigation of Harding Park and Fleming golf courses.

Plainly marked purple pipelines, completely separate from drinking water systems, deliver the water to user sites. Water recycling is a safe and proven practice. For many years, recycled water has been safely used for landscape irrigation purposes throughout California and the world saving precious potable water for other uses (Daly City, 2009).

Studies have been performed to investigate recycled water opportunities based on production at the South San Francisco/San Bruno Water Quality Control Plant (Carollo, 2008, 2009). These documents analyzed irrigation demands and infrastructure needs. Demand analysis showed a Phase I average annual recycled water demand of 0.60 mgd and a Phase II average annual recycled water demand of 0.94 mgd. The estimated project costs are $44 million for Phase I and $43.8 million for Phase II. Such projects may be pursued in the future should costs become better aligned with the benefits of the additional reliable supply.

### 2.5.3 Recycled Water Quantity and Quality

Throughout the year, NSMCSD monitors water quality to maintain compliance with Title 22 for unrestricted use. Monitoring is performed for the following: flow rate, total coliform, contact time, turbidity, dissolved oxygen, dissolved sulfides, and applicable standard observations. NSMCSD additionally monitors pH, electrical conductivity, TDS, boron, chloride, sodium, sodium adsorption ratio, adjusted sodium adsorption ratio, and bicarbonate (ESA, 2009).

# 3 WATER REQUIREMENTS AND SUPPLIES

## 3.1 CURRENT AND HISTORICAL WATER REQUIREMENTS AND SUPPLIES

South Westside Basin groundwater, imported water from the SFPUC, and small quantities of recycled water are used to meet water demands in the South Westside Basin as summarized in Table 3.1. All annual values represent calendar years. Details by agency are provided in Section 3.1.2.

**Table 3.1 Summary of Current Water Supply Sources (2010)**

| Entity | Supply (AFY) | | | |
|---|---|---|---|---|
| | South Westside Basin Groundwater[1] | Imported Water[2] | Recycled Water[1] | Total |
| **Burlingame** | 0 | 4,389 | 0 | *4,389* |
| **CalWater** | 453 | 8,075 | 0 | *8,528* |
| **Daly City[3]** | 1,743 / 3,947 | 5,524 / 3,320 | 0 | *7,267* |
| **Millbrae** | 0 | 2,482 | 0 | *2,482* |
| **San Bruno** | 2,364 | 1,637 | 0 | *4,001* |
| **Irrigators[4]** | 1,800 | 0 | 412 | *2,212* |
| *Total[5]* | *8,564* | *19,903* | *412* | *28,879* |

1 – SFPUC, 2011. Since Olympic Club and San Francisco Golf Club overlie both the North Westside Basin and South Westside Basin, the irrigation use assumes the following: Olympic Club – 50 percent of total recycled water use in the North Westside Basin and 50 percent use in the South Westside Basin; and San Francisco Golf Club – 90 percent of total recycled water use in the North Westside Basin and 10 percent use in the South Westside Basin.
2 – BAWSCA, 2011
3 - Daly City banked 2,204 AF of water in a conjunctive use arrangement with SFPUC, resulting in lower than normal groundwater production and higher than normal imported water purchases in 2010. The first value listed is the actual groundwater production and imported water purchase. The second value listed is the adjusted value.
4 –For the irrigators, all groundwater production within the South Westside Basin is listed, including estimated production in Millbrae and Burlingame. For comparison to the basin yield estimate (which does not include the Millbrae and Burlingame area; see Section 3.5.2), a total irrigation production of 1,139 and a total South Westside Basin groundwater production of 5,700 AF (7,904 AF when including banked Daly City production) should be used.

5 – Totals utilize Daly City values adjusted for conjunctive use.

Water demand in the Plan Area is somewhat higher in the summer months than in the winter months, primarily due to outdoor use and irrigation demands. The current water supply facilities are capable of meeting demands throughout the year, including summer days with high water use. The typical average monthly water supply distribution is shown in Figure 3.1, based on monthly data from the South Westside Basin municipal water purveyors.

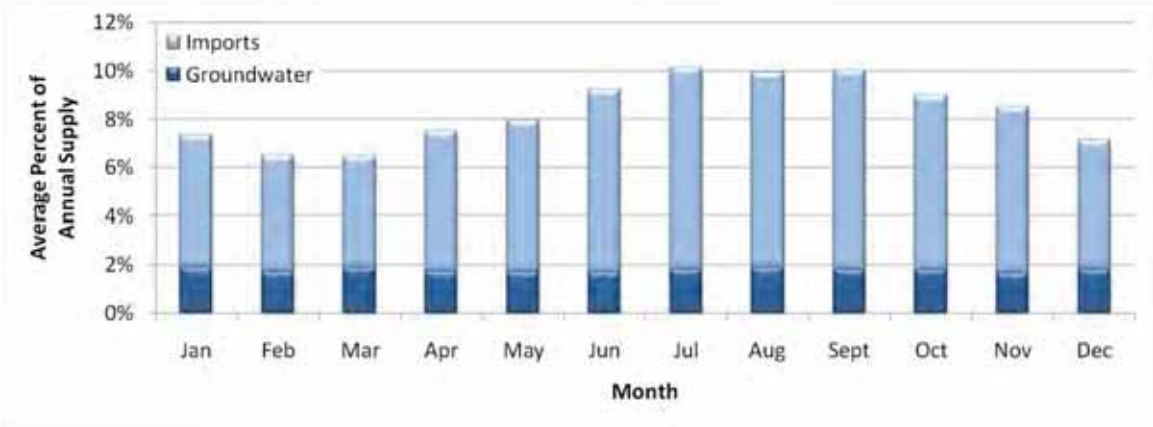



**Figure 3.1 Average Monthly Distribution of Annual Municipal Supply, South Westside Basin**

### 3.1.1 WHOLESALE WATER AGENCIES

Imported water is brought into the Plan Area by SFPUC, a wholesaler of imported water in the South Westside Basin and a retailer in the North Westside Basin.

The City and County of San Francisco, through SFPUC, own and operate a regional water system extending from the Sierra Nevada to San Francisco and serves retail and wholesale customers in San Francisco, San Mateo, Santa Clara, Alameda, and Tuolumne counties. The regional water system consists of water conveyance, treatment, and distribution facilities, and delivers water to retail and wholesale customers. The existing regional system includes more than 280 miles of pipelines, more than 60 miles of tunnels, 11 reservoirs, 5 pump stations, and 2 water treatment plants. The SFPUC currently delivers an annual average of approximately 265 mgd of water to its customers. The water supply source is a combination of local supplies from streamflow and runoff in the Alameda Creek Watershed and in the San Mateo and Pilarcitos creeks watersheds (referred to together as the Peninsula Watersheds), augmented with imported supplies from the Tuolumne River Watershed. Local watersheds provide about 15 percent of total supplies and the Tuolumne River provides the remaining 85 percent (ESA, 2009).

The SFPUC serves approximately one-third of its water supplies directly to retail customers, primarily in San Francisco, and about two-thirds of its water supplies to wholesale customers

by contractual agreement. One retail customer, the Golden Gate National Cemetery in San Bruno, is located within the South Westside Basin. The wholesale customers are largely represented by BAWSCA, which consists of 27 total customers. Some of these wholesale customers have other sources of water in addition to what they receive from the SFPUC regional system, while others rely completely on SFPUC for supply (ESA, 2009).

### 3.1.2 RETAIL AGENCY WATER USE

Details on water use by the retail agencies are presented in the following sections. Data are available from metered agency records, agency UWMPs, South Westside Basin annual groundwater reports, and BAWSCA's annual reports. From these data sources the following can be summarized: supply sources, quantification of the current supply mix, and quantification of historical groundwater production.

#### 3.1.2.1 City of Burlingame

The City of Burlingame covers 4.3 square miles and has a population of approximately 28,000 people. Details of the Burlingame water supply system are summarized below based on the city's UWMP (EKI, 2005). Burlingame owns, operates, and maintains the potable water distribution system that serves drinking water to residential, commercial, and industrial establishments. The water supply is imported water purchased from SFPUC.

Burlingame's distribution system consists of six pumping stations, five water storage tanks, and buried pipes of varying compositions, ages, and sizes. The distribution system provides water to eight pressure zones within the city's water service area.

Approximately 80 percent of all service connections are located in the Aqueduct Zone, which contains most of Burlingame's commercial, industrial, and multi-family residence units. Water is transferred between pressure zones through a system of pipes and pumping stations. The pumping stations currently operated by the city are referred to as:

1. Donnelly
2. Easton
3. Skyview
4. Trousdale
5. Hillside
6. Sisters of Mercy (fire flow only)

Five of the pumping stations transfer water from the lower elevations of the city to the higher elevations, while the Sisters of Mercy station provides fire flow to the Sisters of Mercy property. The sizes of the pumps range between 7.5 and 75 horsepower.

The city's five water storage tanks provide aggregate water storage for 2.94 million gallons. The largest water storage facility is the Hillside Tank, which holds 1.5 million gallons. The smallest

water storage facilities are the individual tanks at the Alcazar and Donnelly sites. There are two tanks at each site and each tank holds 0.05 million gallons.

The total water supply, all from SFPUC purchases, has averaged 5,100 AF over the past 14 years and has shown a slight declining trend over that time period (Figure 3.2). In 2010, the total water supply for Burlingame was 4,389 AF.

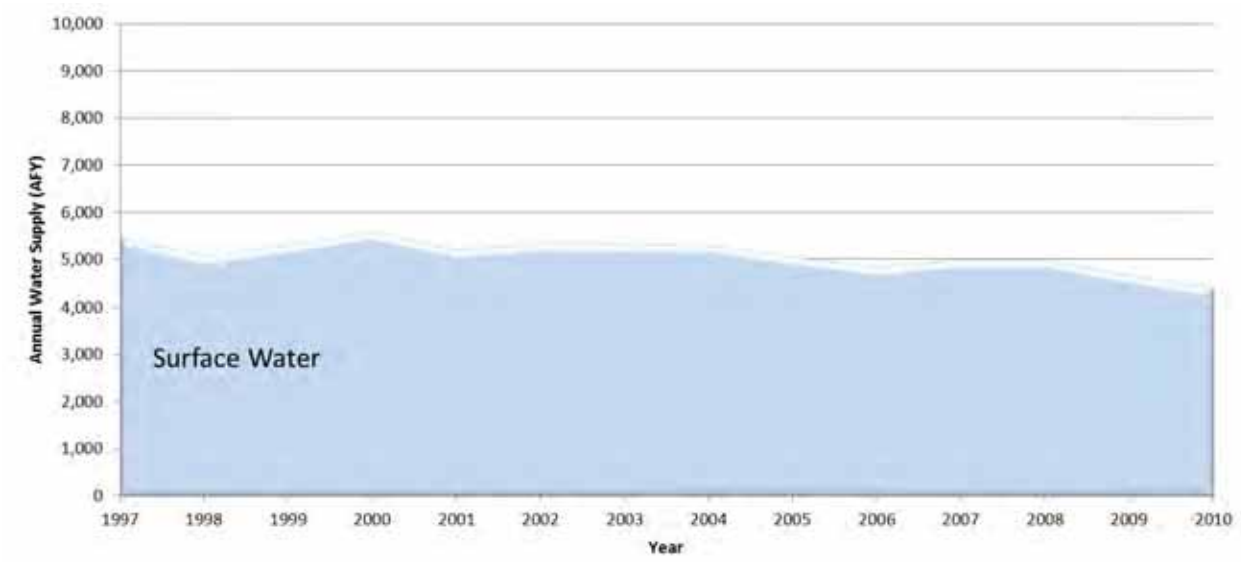



**Figure 3.2 Historical Annual Water Supply, Burlingame**

### 3.1.2.2 California Water Service Company –South San Francisco District

CalWater – South San Francisco District provides water to approximately 56,950 people in a service area of approximately 11 square miles. The service area includes South San Francisco, Colma, a small portion of Daly City, and an unincorporated area of San Mateo County known as Broadmoor, which lies between Colma and Daly City. The South San Francisco system includes 144 miles of pipeline, 12 storage tanks, one collecting tank, and 20 booster pumps.

CalWater uses groundwater and imported surface water from SFPUC to meet demands. CalWater's Individual Supply Guarantee with

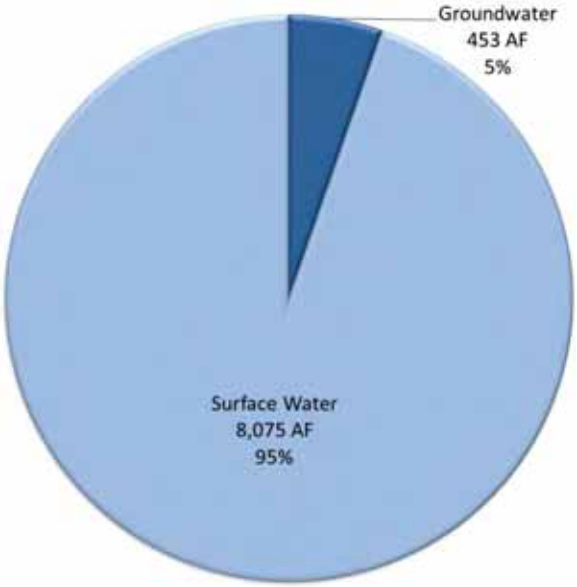



**Figure 3.3a**
**Current (2010) Water Supply Sources, CalWater – South San Francisco District**

SFPUC is 35.68 mgd (or approximately 39,967 AFY) and also supplies CalWater's other Bay Area Districts: Bear Gulch and Mid-Peninsula. Imported surface water has been used to a greater extent recently due to reduced groundwater production, as discussed in the following paragraph. In 2010, imported surface water accounted for 95 percent of CalWater's supply, while the remaining 5 percent was supplied by groundwater (Figure 3.3a).

The South San Francisco District has seven wells with a total design capacity of 1,365 gallons per minute (gpm). If operated full-time, these wells could produce 1.97 mgd (2,207 AFY). This production capacity represents approximately 20 to 25 percent of the annual demand in the district. While production in the 1950s and 1960s averaged 2,031 AFY, a maximum of 1,524 AFY has been pumped in calendar years since 1970. From 1998 to 2002, production averaged 1,212 AFY. However, recent years have seen little groundwater production due to participation in the ILPS and unforeseen issues with the wells. There was no groundwater production from 2003-2007; groundwater production steadily increased from when the wells were returned to service in 2008 to where CalWater produced 453 AF of groundwater in 2010. Historical water supplies by year are shown in Figure 3.3b. The district plans to return to earlier levels of production (1,535 AFY) in the future (CalWater, 2011).

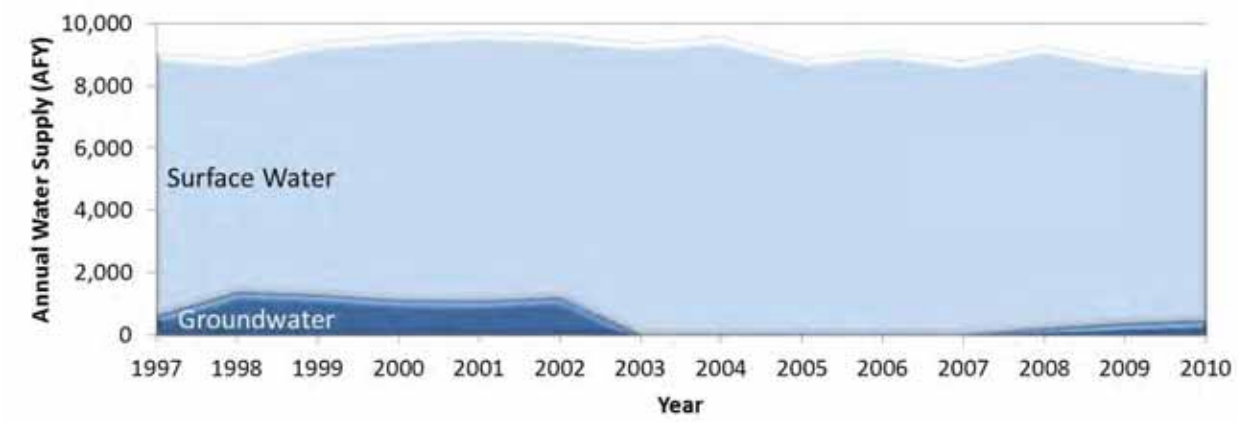



**Figure 3.3b Historical Annual Water Supply, CalWater – South San Francisco District**

### 3.1.2.3 City of Daly City

Daly City is in the northern part of San Mateo County, adjacent to the southern boundary of the City and County of San Francisco. Water service is provided by the Daly City Department of Water and Wastewater Resources. The city has an estimated 2009 population of 102,165, including small areas served by CalWater.

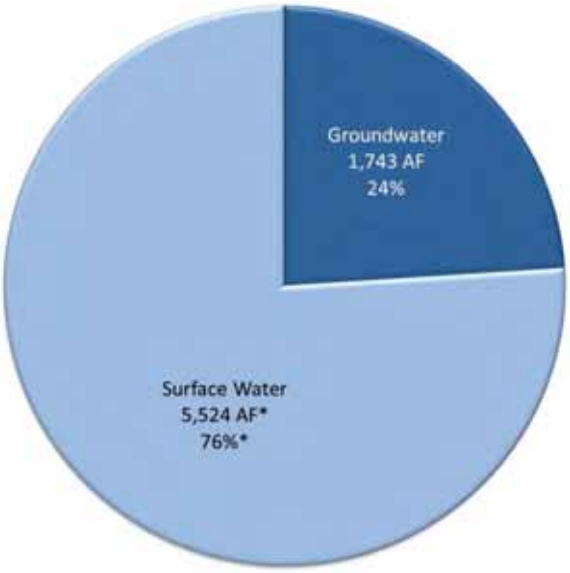
Daly City has three water sources: groundwater, water purchased from SFPUC, and recycled water.

Daly City's purchases of water from SFPUC are based on an Individual Supply Guarantee of 4.292 mgd (4,808 AFY) (Daly City, 2005) and are provided through 10 SFPUC turnouts. The

turnouts can supply approximately 30.89 mgd at a rate of about 21,400 gpm (Daly City, 2005). During 2010, Daly City's water supply was provided by 76 percent imported surface water from SFPUC and 24 percent from local groundwater (see Figure 3.4a). The 76 percent includes participation in the ILPS. If the in-lieu water were accounted for as groundwater, the percentages would be 46 percent imported surface water and 54 percent groundwater. During normal well operation, SFPUC provides approximately 55 percent of the city's annual water supply. Daly City has been involved in the ILPS for much of the period since 2002 and purchases from SFPUC have contributed up to 92 percent of the city's annual water supply (Figure 3.4b).

Daly City has six active groundwater wells with a combined capacity of 4.25 mgd (4,760 AFY). During conjunctive use in an emergency or drought scenario, well water can contribute approximately 50 percent of the Daly City water supply (Daly City, 2005).

For the purposes of this document, recycled water produced by Daly City is accounted for under the user of the supply, Private Groundwater Producers in Section 3.1.3.




* Includes 2204 AF of in-lieu recharge water

**Figure 3.4a Current (2010) Water Supply Sources, Daly City**

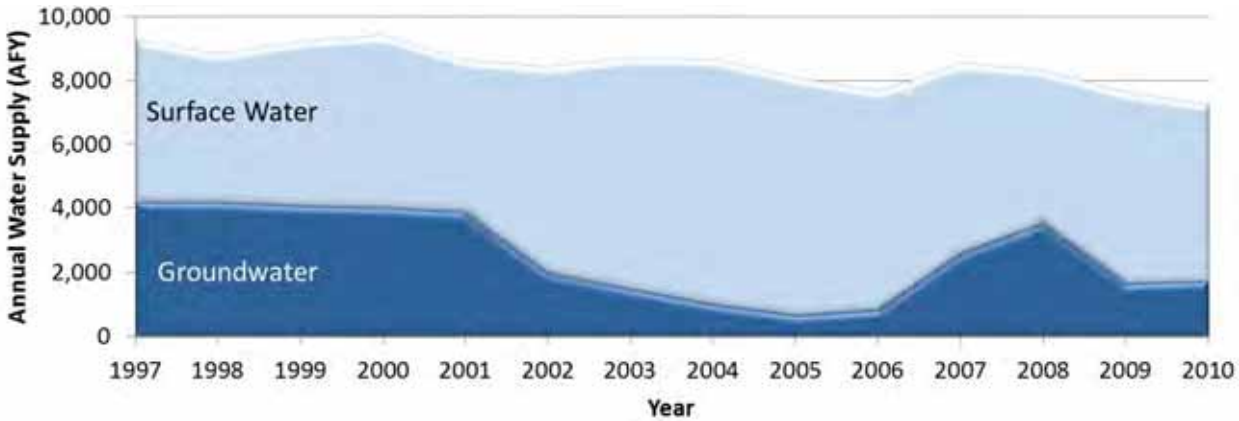



**Figure 3.4b Historical Annual Water Supply, Daly City**

### 3.1.2.4 City of Millbrae

Millbrae provides water to approximately 21,800 residents within a service area of 3.2 square miles (Figure 1.3). The City of Millbrae owns and operates approximately 70 miles of domestic water mains, 450 fire hydrants, 1,500 valves, 11 pressure reducing stations, 6 water storage tanks, 2 water pump stations, and approximately 6,500 service connections (Millbrae, 2005). Millbrae purchases its water from SFPUC and has an Individual Supply Guarantee of 3,531 AFY. Total water supplies averaged 2,790 AFY over the 1997-2010 period, and was 2,482 AF in 2010, as shown in Figure 3.5.

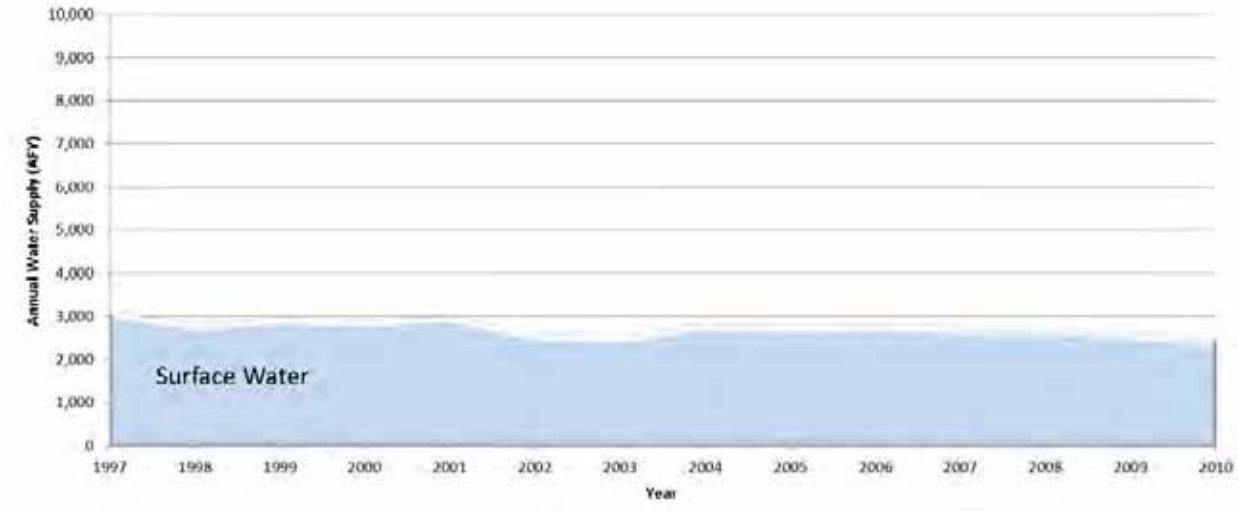



**Figure 3.5 Historical Annual Water Supply, Millbrae**

### 3.1.2.5 City of San Bruno

San Bruno owns, operates, and maintains the potable water distribution system that serves drinking water to residential, commercial, institutional, and limited industrial establishments within San Bruno's service area. The City of San Bruno covers 5.5 square miles and has a population of approximately 41,120 people. San Bruno's water system consists of five groundwater supply wells, eleven pressure zones maintained with eight booster pump stations, eight water storage tanks, one filtering plant, 900 fire hydrants, 9,000 valves, more than 100 miles of water mains ranging from 2 inches to 16 inches in

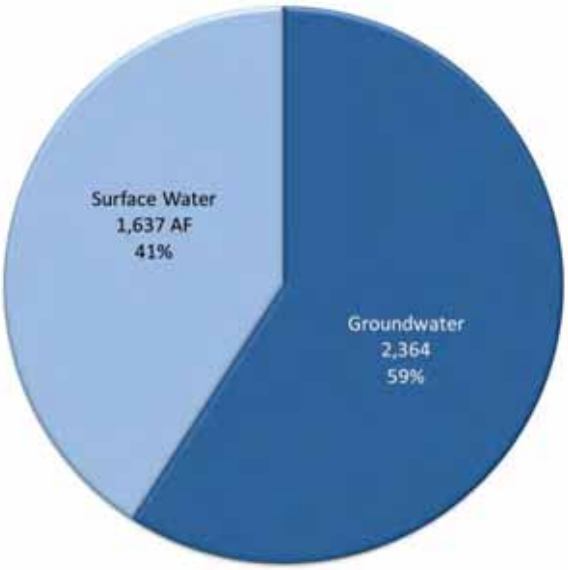



**Figure 3.6a Current (2010) Water Supply Sources, San Bruno**

diameter, and 12,415 metered service connections. San Bruno has four connections to the SFPUC water supply system and one connection to the NCCWD water supply system. San Bruno's water system can deliver water at a pressure of at least 30 pounds per square inch (psi) during peak-hour demand and 20 psi during maximum-day demand coincident with a fire flow (EKI, 2007).

Water supplied through the city's distribution system is a combination of groundwater pumped at San Bruno's five groundwater supply wells, and water purchased from SFPUC and NCCWD. Purchases from SFPUC are based on an Individual Supply Guarantee of 3.25 mgd (or approximately 3,600 AFY) (EKI, 2007). Note that one of San Bruno's five wells, SB-15, is not currently operational; a replacement well is in the process of sited and designed.

In 2010, groundwater wells provided 2,364 AF of water, or 59 percent of the total supply, while imported water provided the remaining 1,637 AF, as shown in Figure 3.6a. During the 1997 – 2010 period, not including the 2003-2004 In-Lieu Pilot Study, groundwater provided approximately 2,120 AFY, or 46 percent of the total supply, as shown in Figure 3.6b.

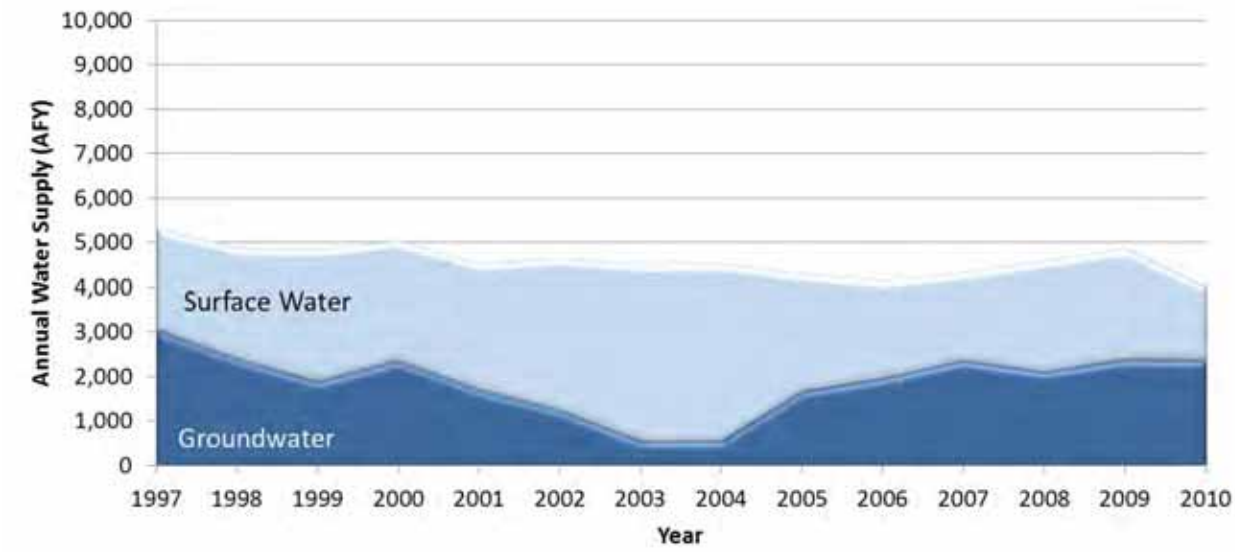



**Figure 3.6b Historical Annual Water Supply, San Bruno**

### 3.1.3 PRIVATE GROUNDWATER PRODUCERS

Private groundwater producers in the Plan Area pump groundwater primarily for irrigation of golf courses, cemeteries, and landscaping. There is some domestic production, particularly in the Hillsborough area. These users typically do not meter the volume of water produced, therefore these volumes must be estimated to present a complete picture of water use. Historical use of South Westside Basin groundwater by private groundwater producers has been estimated by HydroFocus (2011), to support the development of the Westside Basin Groundwater Flow Model (Groundwater Model), using land use, soils, and hydrologic data.

Additional data on private groundwater use is available in annual reports (SFPUC, 2011). Estimates of production are approximately 1,800 AFY based on current (2010) conditions in the basin. The 2010 estimate includes the users summarized in Table 3.2.

**Table 3.2 Summary of 2010 Private Groundwater Production**

| Entity | 2010 Production | Source | Notes |
|---|---|---|---|
| **Lake Merced Golf Course** | 33 AF | metered (SFPUC, 2011) | |
| **Olympic Golf Club** | 10 AF | metered (SFPUC, 2011) | |
| **California Golf Club of San Francisco** | 237 AF | estimated* (HydroFocus, 2011) | Other estimate (Carollo, 2008) is 206 AF |
| **Cemeteries** | 859 AF | estimated* (HydroFocus, 2011) | Other estimate (Carollo, 2008) is 787 AF |
| *Subtotal, Daly City to San Bruno* | *1,139 AF* | | |
| | | | |
| **Hillsborough area domestic wells**** | 326 AF | estimated* (HydroFocus, 2011) | |
| **Green Hills and Burlingame Country Clubs**** | 335 AF | estimated* (HydroFocus, 2011) | |
| *Subtotal, Millbrae to Burlingame*** | *661 AF* | | |
| | | | |
| **Total**** | **1,800 AF** | | |

*Estimates from HydroFocus (2011) are based on the average production using the 2008 No Project Baseline over the full 1959-2009 hydrology.

**These estimates include the Millbrae and Burlingame area production (Burlingame domestic wells, Green Hills Country Club and Burlingame Country Club). Without the Millbrae and Burlingame area, the private production is 1,139 AF. The without- Millbrae and Burlingame value is more appropriate for comparisons with the results of HydroFocus (2011) as that document summarized the private production in the Westside Basin only as far south as San Bruno. Minor differences between the average annual private production estimated by that document (1,122 AFY) and the without-Burlingame values presented here are a result of usage of calendar years in this document versus water years in the HydroFocus document, minor differences in developing the average value, and the incorporation of newly available metered data in this document.

Recycled water produced by NSMCSD is used by private groundwater producers. Much of this use is along the boundary with the North Westside Basin. For accounting purposes, recycled

water use in the South Westside Basin includes use in Daly City medians, at Lake Merced Golf Club, and at the Olympic Golf Club, but not at the San Francisco Golf Club, which otherwise would use a groundwater well within the North Westside Basin. Based on this assumption, approximately 410 AF of recycled water was used in the South Westside Basin.

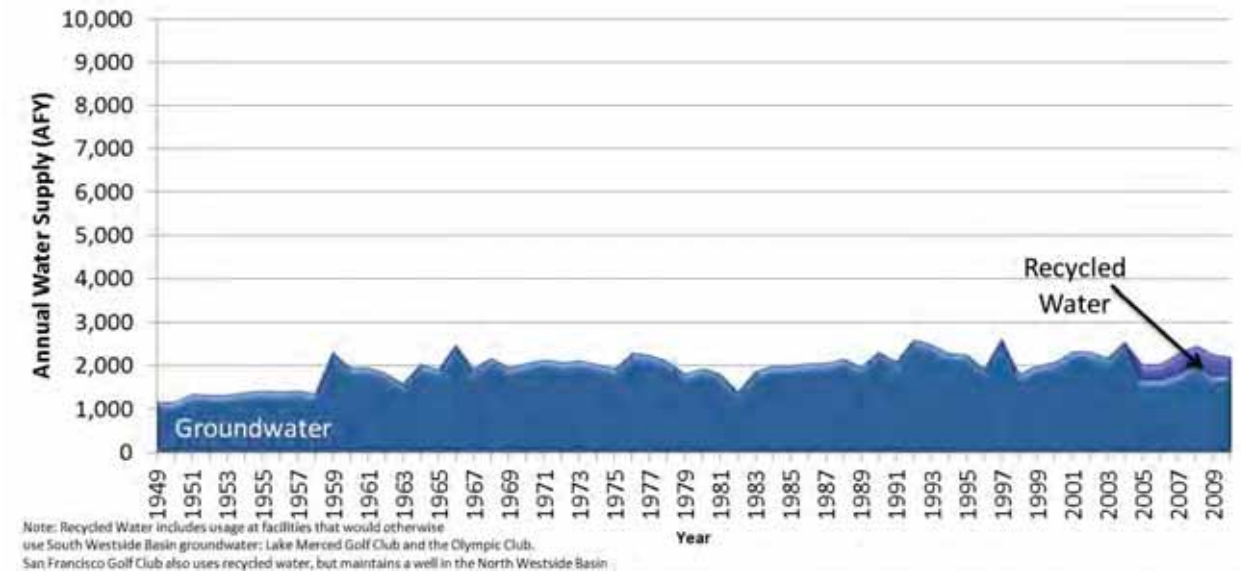



**Figure 3.7 Historical Annual South Westside Basin Groundwater Production, Private Groundwater Producers**

### 3.1.4 TOTAL SOUTH WESTSIDE BASIN

Current and historical water demands in the South Westside Basin have been met with purchases of imported surface water from SFPUC, local groundwater, and a smaller quantity of recycled water, as shown in Figure 3.8.

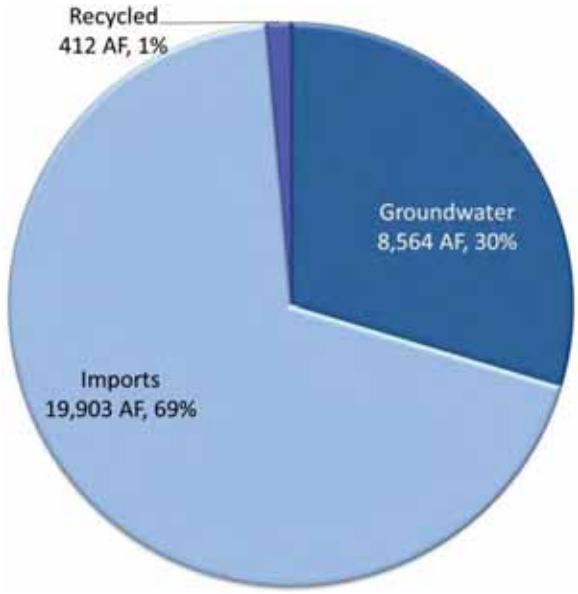



**Figure 3.8 Current Water Supply Sources, South Westside Basin**

South Westside Basin groundwater is an important component of the supply mix; Table 3.3 shows the percentage of the total water supply provided by groundwater in 2010 for the entities in the basin.

**Table 3.3 2010 Groundwater Production by Entity as a Percent of Total Water Supply**

| Entity | Groundwater as Percent of Total Water Supply |
|---|---|
| Burlingame | 0% |
| CalWater – South San Francisco District | 5% |
| Daly City | 24%* |
| Millbrae | 0% |
| San Bruno | 59% |
| private groundwater producer | 81% |

*54% if including in-lieu recharge

Figure 3.9 shows total annual groundwater production by major producer. In 2010, total groundwater production from the South Westside Basin was approximately 8,600 AF, including approximately 2,200 AF of banked groundwater under the ILRP to be potentially extracted at a later date. Figure 3.10 shows the distribution of groundwater production throughout the South Westside Basin, based on 2008 production data.

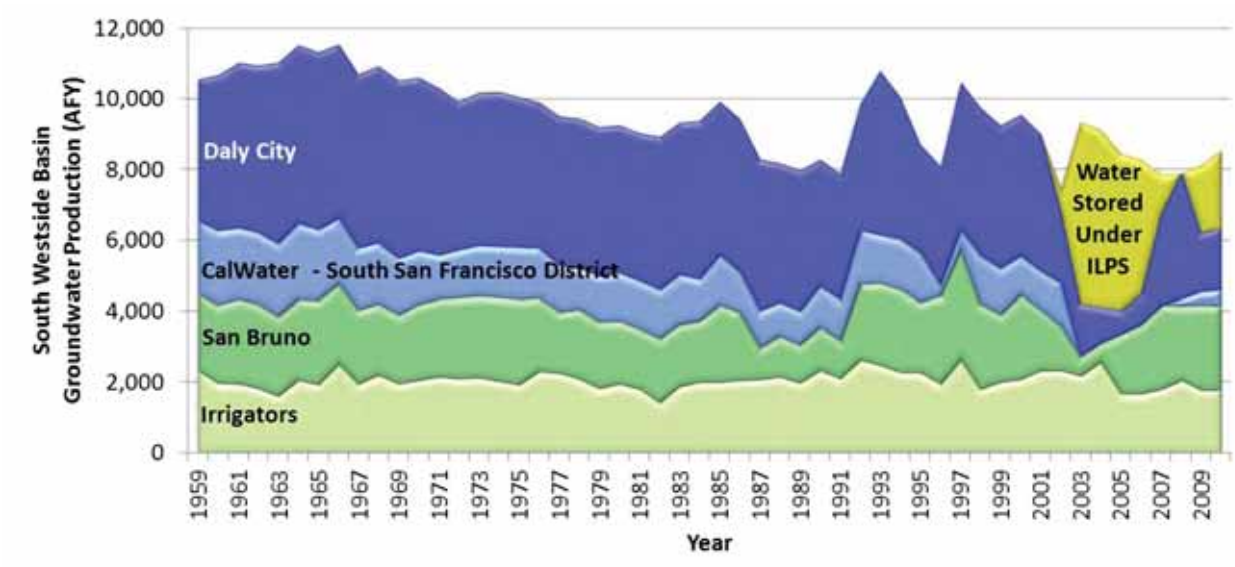
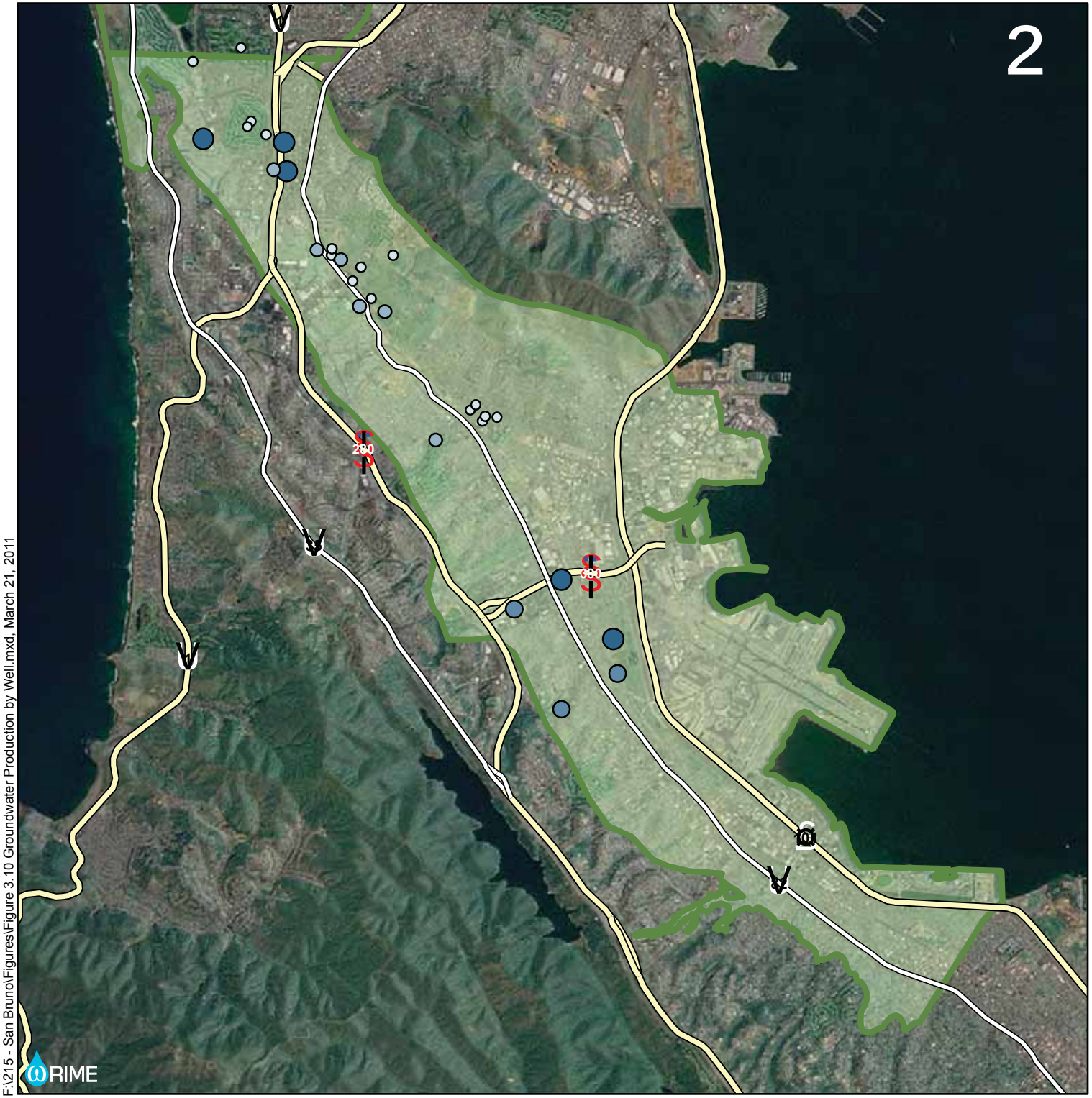



**Figure 3.9 Historical Annual South Westside Basin Groundwater Production by Entity**




# Figure 3.10
## Groundwater Production by Well

**Legend**

- Highways
- Groundwater Basin
- Plan Area

**2008 Production (af)**

- 1 - 100
- 100 - 250
- 250 - 500
- > 500

0 0.5 1 2 Miles

Groundwater Production Sources:
CalWater, personal communication, 2009
City of Daly City, personal communicaiton, 2009
City of San Bruno, pers. comm., 2009
Hydrofocus, 2009
SFPUC, 2009

F:\215 - San Bruno\Figures\Figure 3.10 Groundwater Production by Well.mxd, March 21, 2011

ωRIME

## 3.2 CURRENT WATER BUDGET

A more thorough understanding of the groundwater conditions can be obtained through analysis of the water budget, which estimates the different inflows and outflows of the aquifer. There are several different components of inflows and outflows. A South Westside Basin water budget was estimated below based on the results of the Groundwater Model, which is described in *Westside Basin Groundwater-Flow Model: Updated Model and 2008 No-Project Simulation Results.* (HydroFocus, 2011).

The simplified version of the water budget equation for a basin is:

$$\text{Inflow} - \text{Outflow} = \text{Storage Change} \qquad (1)$$

Inflow, outflow, and storage consist of the following more detailed subcomponents:.

- Inflow
  - Applied water components
    - Agricultural water use
    - Landscape and outdoor irrigation
  - Recharge from precipitation
  - Boundary flow from Coast Range and San Bruno Mountain
  - Underflow from
    - North Westside Basin
    - Pacific Ocean
    - San Francisco Bay
- Outflow
  - Groundwater production
  - Underflow to
    - Pacific Ocean
    - San Francisco Bay
  - Evapotranspiration
- Groundwater storage change

Water budget estimates were based on HydroFocus's (2011) basin-wide groundwater modeling effort. That document included the development of the 2008 No Project Scenario, which simulates a 47-year continuation of anticipated land and water use conditions as of May 2008. It assumes no new projects are implemented, but includes new supply wells, planned operational changes to the magnitude and spatial distribution of pumpage, and existing recycled water projects in place as of May 2008. The 2008 No Project Baseline simulation results were averaged over the full 1959-2009 hydrology to develop an average annual water budget for the central portion of the South Westside Basin (Daly City southeast to San Bruno). The average annual water budget for the South Westside Basin is presented in Table 3.4.

**Table 3.4 Estimated Average Annual* South Westside Basin Water Balance**

| Water Budget Component | Average Annual Volume (AFY) |
|---|---|
| Groundwater Production | 8,756 |
| Underflow to the Bayshore area | 460 |
| Underflow to Millbrae | 429 |
| Underflow to North Westside Basin | 71 |
| *Total Outflow* | *9,716* |
| | |
| Recharge, all sources | 4,517 |
| Underflow from the Bayshore area | 762 |
| Underflow from Millbrae | 967 |
| Underflow from North Westside Basin | 2,167 |
| Underflow across Serra Fault | 1,109 |
| *Total Inflow* | **9,522** |
| | |
| *Change in Storage* | *-194* |

*Average of 1959-2009 Hydrology

The change in storage is less than zero, showing a reduction in groundwater in storage over time. However, this value is small and within the errors associated with the data and the model. For example, the 194 AFY is just 17% of the simulated unmetered groundwater production in the basin (1,122 AFY). There are significant unknowns in the volume of unmetered groundwater pumped by private groundwater producers as well as in other modeling parameters including future precipitation, recharge, and aquifer parameters. Given the uncertainties, the small change in storage, with outflows exceeding inflows by approximately 2 percent, should be considered as showing the basin essentially in balance.

## 3.3 PROJECTED WATER REQUIREMENTS AND SUPPLIES

Projected water use is an important component of determining the ability of a basin to meet future demands. Figure 3.11 illustrates the projected water supplies and demands through 2035

by the primary retail water agencies in the South Westside Basin using projections discussed in Section 3.3.1. Private groundwater producers are also included with the assumption of a continuation of current levels of production. The water served by the retail water agencies includes groundwater from the South Westside Basin, imported surface water purchased from SFPUC, and recycled water.

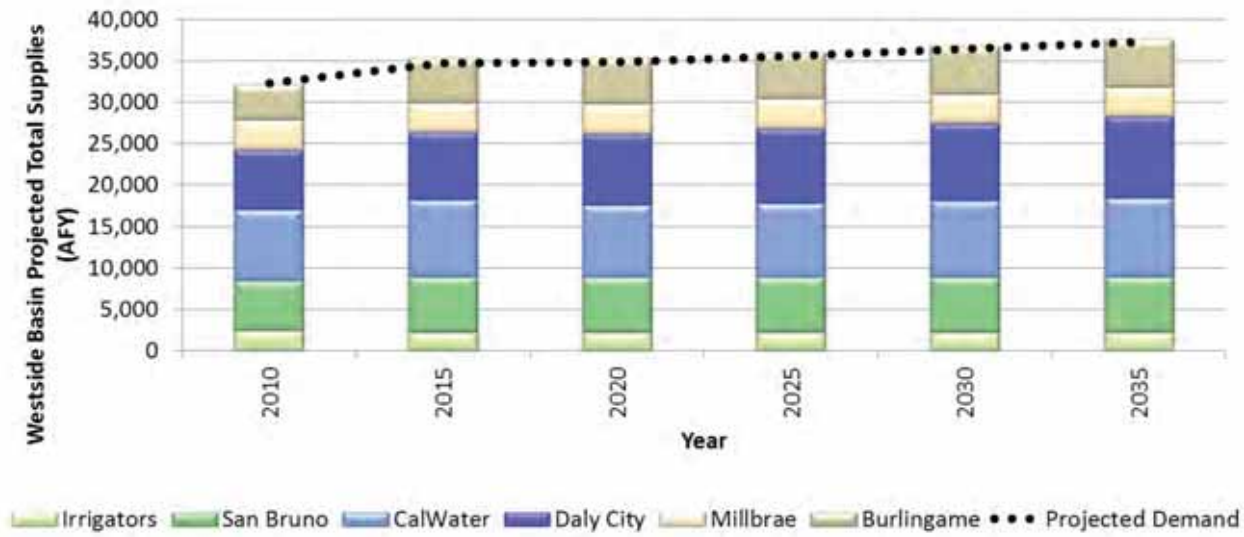



**Figure 3.11 Projected Water Supplies in the South Westside Basin, by Agency**

Table 3.5a presents current and projected South Westside Basin groundwater production through 2030. Table 3.5b presents the projected increase in South Westside Basin groundwater production compared to 2010 production.

While these projections represent the best available information from the agencies, they are subject to uncertainties related to climatic conditions, availability of water supplies, maintenance issues, and policy changes. Additionally, no projections are available for the private groundwater producers, whose production is assumed to remain at current levels, which themselves are largely estimated. Even with these uncertainties, the existing projections provide a good baseline for anticipated future use and for determining how the basin would respond to future use and management. These projections are not intended to set limits for the production by individual agencies; such limits may be established by the agencies in the future, but would likely be developed based on a wide range of demand and supply information, as discussed in Section 5.3.1, Action F5.

**Table 3.5a Current and Projected South Westside Basin Groundwater Production (AFY)**

| Agency | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|---|
| **Burlingame** | 0 | 0 | 0 | 0 | 0 | 0 |
| **CalWater – South San Francisco** | 453 | 1,535 | 1,535 | 1,535 | 1,535 | 1,535 |
| **Daly City** | 1,743*<br>3,947 | 3,349 | 3,842 | 3,842 | 3,842 | 3,842 |
| **Millbrae** | 0 | 0 | 0 | 0 | 0 | 0 |
| **San Bruno** | 2,364 | 2,364**<br>3,026 | 2,364**<br>3,026 | 2,364**<br>3,026 | 2,364**<br>3,026 | 2,364**<br>3,026 |
| **Private Producers*** ** | 1,800 | 1,800 | 1,800 | 1,800 | 1,800 | 1,800 |
| ***Total**** ** | **8,564** | **9,048** | **9,541** | **9,541** | **9,541** | **9,541** |

* Daly City's 2010 production was 1,743 AF, but does not include 2,204 AF of groundwater stored as a result of in-lieu water deliveries under the ILPS. For accounting purposes, this pumping may be included in 2010.

** San Bruno projects future groundwater production at its current rate. However, it is evaluating whether it can increase its production of groundwater to a rate of 3,026 AFY (2.7 mgd), which is consistent with a historical maximum annual production rate. San Bruno will coordinate with other basin users to ensure the groundwater basin is managed sustainably and in a manner consistent with the consensus driven basin yield analysis based on the modeling of HydroFocus, Inc.

*** Values for Private Producers include production outside of the area defined for the basin yield. See Section 3.5.

**** Totals utilize the Daly City values based on effective long-term pumping and San Bruno at its 2010 rate.

Sources: Daly City projected production: Brown and Caldwell, 2011;
San Bruno projected production: EKI, 2011;
CalWater projected production: CalWater, 2011

**Table 3.5b Projected Change in South Westside Basin Groundwater Production, from 2010 Production (AFY)**

| Agency | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|
| **Burlingame** | 0 | 0 | 0 | 0 | 0 |
| **CalWater – South San Francisco** | 1,082 | 1,082 | 1,082 | 1,082 | 1,082 |
| **Daly City** | 1,606*<br>-598 | 2,099*<br>-105 | 2,099*<br>-105 | 2,099*<br>-105 | 2,099*<br>-105 |
| **Millbrae** | 0 | 0 | 0 | 0 | 0 |
| **San Bruno** | 662**<br>0 | 662**<br>0 | 662**<br>0 | 662**<br>0 | 662**<br>0 |
| **Private Producers** | 0 | 0 | 0 | 0 | 0 |
| *Total**** | **484** | **977** | **977** | **977** | **977** |

* When compared to Daly City's actual 2010 production (1,743 AF), future Daly City groundwater production will increase by 2,099 AFY. However, Daly City's actual 2010 production does not include 2,204 AF of groundwater stored as a result of in-lieu water deliveries under the ILPS. For accounting purposes, this pumping may be included in 2010. Compared to the pumping value that includes the stored water, future Daly City groundwater production will decrease by 105 AFY.

** San Bruno projects future groundwater production at its current rate 2,354 AFY (2.1 mgd), but is evaluating its ability to increase its production of groundwater to a rate to 3,026 AFY (2.7 mgd). There is no change from the current rate, while the increase to the higher rate would be 662 AFY.

*** Totals utilize the Daly City values based on effective long-term pumping and San Bruno at its current rate.

The projected South Westside Basin supplies are shown in Figure 3.12 with the historical production discussed in Section 3.1. Projected demand in the South Westside Basin is within 300 AFY of projected supply.

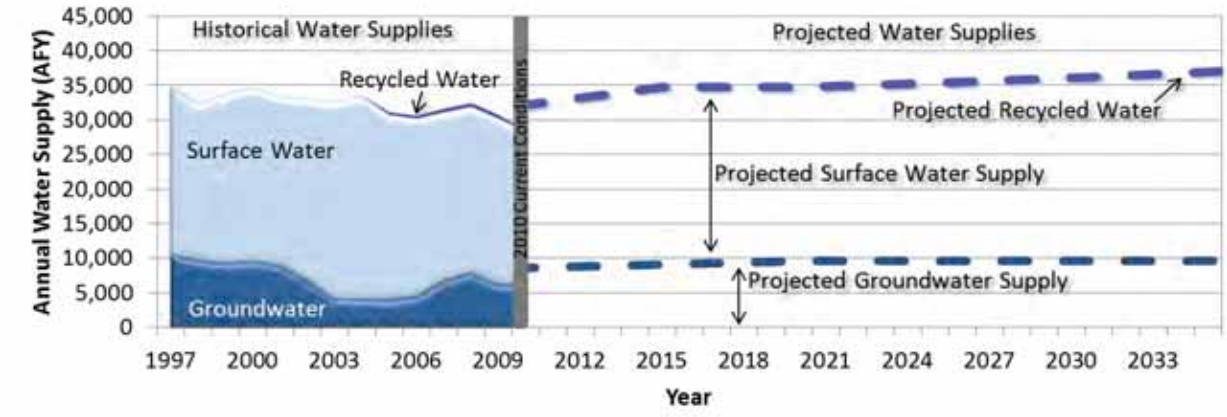



**Figure 3.12 Historical and Projected South Westside Basin Groundwater Supply**

### 3.3.1 AGENCY WATER PROJECTIONS

Detailed water supply projections for each retail water agency, as well as private irrigators, are provided in the following sections.

#### 3.3.1.1 City of Burlingame

Water demands for the City of Burlingame are projected to increase from 4,389 AFY in 2010 to 5,852 AFY in 2035 (Burlingame, 2011), as shown in Figure 3.13. The projected supply meets the projected demand. No groundwater use is projected and imported water use is projected to stay within the city's Individual Supply Guarantee of 5,867 AFY.

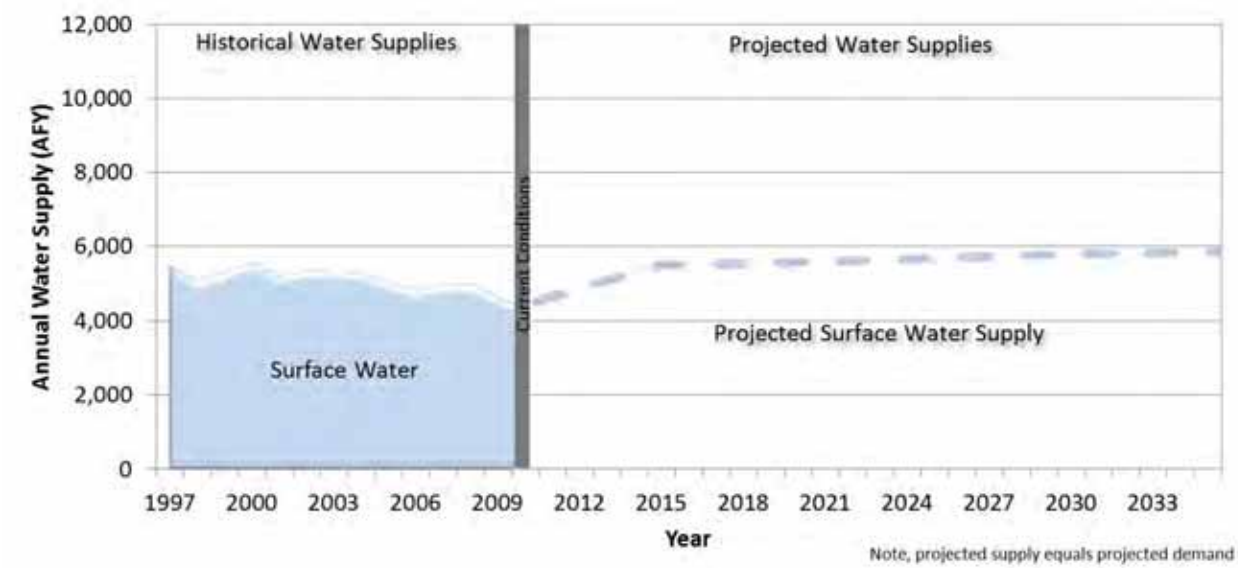



**Figure 3.13 Projected Water Supply for Burlingame**

### 3.3.1.2 California Water Service Company – South San Francisco District

Water demands for CalWater's South San Francisco District service area are projected to increase from 8,527 AFY in 2010 to 9,494 AFY in 2035. These demands will be met through:

- Approximately 1,100 AFY of additional South Westside Basin groundwater supplies as CalWater returns its wellfield to producing 1,535 AFY
- Reduction of surface water purchases by approximately 200 AFY (CalWater, 2011)

CalWater's projected supplies are shown in Figure 3.14. The projected supply meets the projected demand.

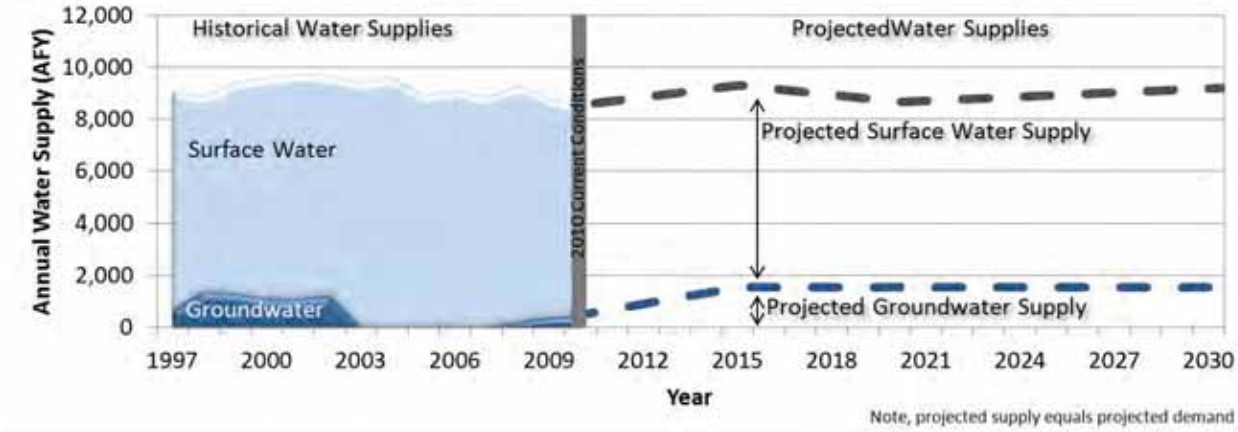



**Figure 3.14 Projected Water Supply for CalWater**

#### 3.3.1.3 City of Daly City

Water demands for Daly City are projected to increase from 7,267 AFY in 2010 to 10,552 AFY in 2035. These demands will be partially met through:

- A decrease of approximately 100 AFY of South Westside Basin groundwater supplies
- An increase in surface water purchases by approximately 2,700 AFY (Brown and Caldwell, 2011)

These values are compared to 2010 supplies with in-lieu surface water deliveries accounted for as South Westside Basin groundwater. Total projected supplies in 2035 are 9,858 AFY and are less than the projected demand of 10,552 AFY. Daly City's projected supplies are shown in Figure 3.15. Imported water use is projected to exceed Daly City's Individual Supply Guarantee of 4,808 AFY, with a projected surface water supply of 6,016 AFY by 2035 (Daly City, 2011).

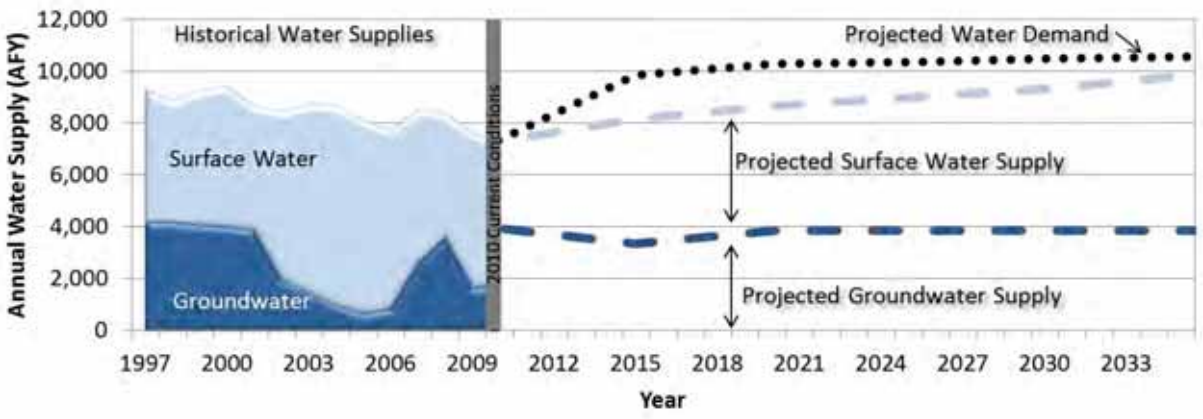



**Figure 3.15 Projected Water Supply for Daly City**

#### 3.3.1.4 City of Millbrae

Water demands for Millbrae are projected to increase from 2,482 AFY in 2010 to 3,379 AFY in 2035. By 2035, total surface water supplies are projected to total 3,558 AFY (Millbrae, 2011), as shown in Figure 3.16. No groundwater use is projected and imported water use is projected to slightly exceed the city's Individual Supply Guarantee of 3,533 AFY.

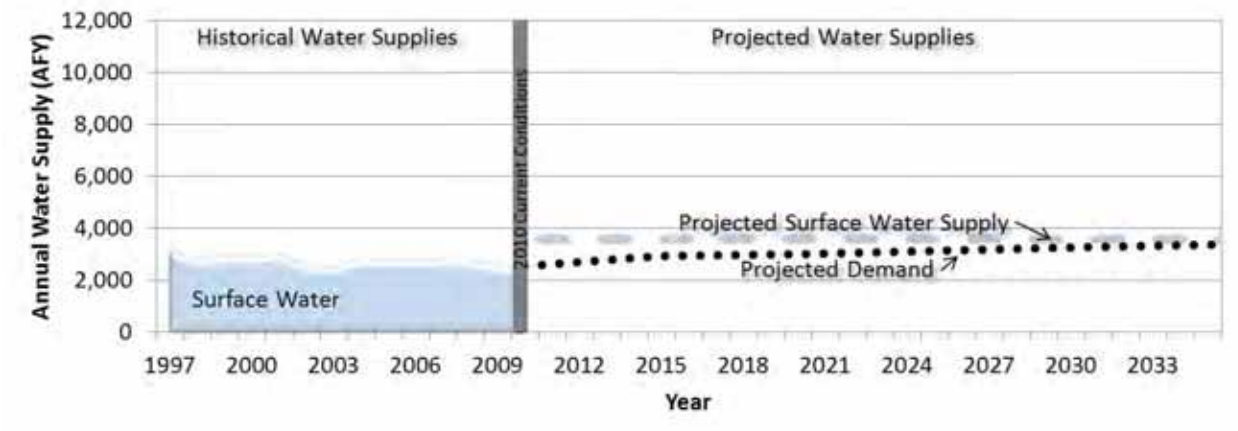



**Figure 3.16 Projected Water Supply for Millbrae**

### 3.3.1.5 City of San Bruno

Water demands for San Bruno are projected to increase from 4,001 AFY in 2010 to 5,751 AFY in 2035. These demands will be met through:

- Continued South Westside Basin groundwater production at 2,364 AFY
- Increase in surface water purchases from SFPUC and NCCWD from 1,637 AFY to 3,699 AFY
- Potential additional future groundwater production of 673 AFY. San Bruno will evaluate its ability to increase its groundwater production to 2.7 MGD, which is consistent with its historical maximum production rate. (EKI, 2011)

San Bruno's projected supplies are shown in Figure 3.17. Projected imported water purchases would be within San Bruno's Individual Supply Guarantee of 3,643 AFY.

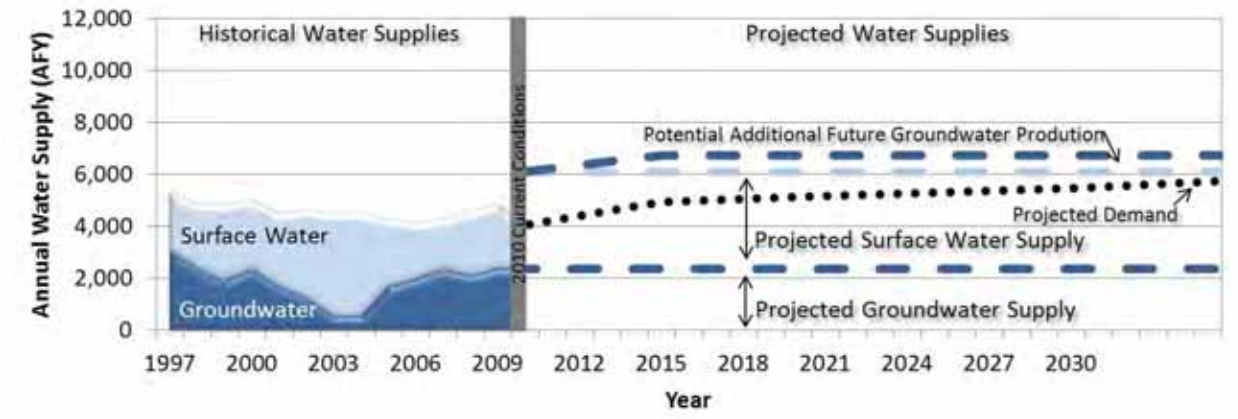



**Figure 3.17 Projected Water Supply for San Bruno**

### 3.3.2 PRIVATE GROUNDWATER PRODUCERS

No projections of private groundwater use are available. Modeling results show an average demand of approximately 1,800 AFY (see Section 3.1.3). Future use is assumed to continue at this level. Of the 1,800 AFY, 1,139 AFY is produced from the area used to estimate basin yield, as described in Section 3.5

## 3.4 PROJECTED WATER BUDGET

The projected changes in South Westside Basin groundwater production indicated in agency projections in Section 3.3, show an increase in groundwater production of 977 AFY (Table 3.5b), from 8,564 AFY in 2010 to a projected 9,541 AFY in 2035.

The historical water budget analysis in Section 3.2 showed a basin only slightly out of balance under modeled conditions (8,756 AFY of groundwater production), with a change in storage of approximately -200 AFY. Groundwater production within the central portion of the South Westside Basin (Daly City southeast to San Bruno (an area consistent with the area analyzed in the historical water budget) is projected to increase from 7,904 AFY in 2010 to 8,881 AFY in 2035. This represents only a small increase in groundwater production of 124 AFY over the conditions analyzed in the historical water budget, leaving the basin nearly in balance.

The goals, objectives, elements, and implementation plan presented in the following sections seek to maintain this balance, accounting for increased competition for imported supplies and measures to improve the quantity of groundwater available to the stakeholders in the South Westside Basin.

## 3.5 BASIN YIELD

### 3.5.1 BASIN YIELD DEFINITION

Basin yield is defined in this document as the maximum average annual groundwater production that could be maintained for a long-term time period and that would result in stable groundwater levels. This value does not explicitly take into consideration water quality, surface water resources, or environmental or socio-economic consequences. The basin yield is intended to be used along other data to guide groundwater management. Any use of groundwater has an impact; the aim of the basin yield is to assist in understanding the balances between the use of the groundwater and the impacts caused by that use. The balances in the Westside Basin are based on the following:

- There is a desire to maintain a sustainable groundwater reservoir by not pumping at levels that result in long-term declines in groundwater levels. Avoiding these declines will also avoid increased pumping costs and the need to deepen wells.

- There is a desire to maintain groundwater levels at elevations that prevent or slow the migration of poor quality groundwater. Poor quality groundwater includes the point-source and non-point source contaminants discussed in Section 2.3.8 as well as seawater intrusion discussed in Section 2.3.3.
- As there is little interaction between groundwater and surface water resources in the area, impacts to surface water resources are not directly considered.
- The basin yield estimate will change over time in response to changing hydrology, groundwater production infrastructure, and the built environment. As such, the basin yield definition and estimate is intended to be reviewed and updated at regular intervals.

### 3.5.2 Basin Yield Estimate

A variety of methods may be used to estimate basin yield. These include:

- Analysis of historical production and groundwater levels, identifying periods with stable water levels (if any) and the associated level of groundwater production.
- Development of a water budget to estimate inflow and outflows from the basin. Yield is then estimated as the sum of the change in storage and the volume of groundwater production.
- Development of a numerical groundwater model and simulations to estimate the yield.

The estimate of basin yield is developed through the use of the Groundwater Model, which incorporates the best available knowledge of the basin and was developed in a cooperative manner with extensive input. Basin yield is estimated as a level to maintain current groundwater levels. To reduce risk of seawater intrusion, groundwater levels need to be raised through increased recharge or decreased production. Higher groundwater levels would also reduce pumping costs and could help control migration of lower quality groundwater. Addressing seawater intrusion through the basin yield estimate may be revisited during implementation of the GWMP.

The basin yield estimate is based on work performed by HydroFocus (2011) to determine sensitivity to pumping and the level of municipal pumping that results in zero change in storage. The estimate does not include the southern portion of the South Westside Basin, including the Millbrae and Burlingame areas, due to limited groundwater use and higher model uncertainty due to limited data. In that groundwater modeling exercise, the near-term anticipated groundwater production was modeled over historical hydrology and recent land use. Recent groundwater elevations were used as initial conditions. Municipal groundwater production was then adjusted based on calculated uniform percentages for each water purveyor to determine a level of production that results in zero long-term change in storage. Production

by private producers was left unchanged. The level of groundwater production with no long-term change in storage estimated by this scenario is approximately 10,600 AFY for the entire Westside Basin and approximately 8,600 AFY for the South Westside Basin. This value is consistent with the historical water budget analysis shown in Table 3.4, which showed a decline in storage of 194 AFY with a production of 8,756 AFY. These basin yield estimates are based on the current operating conditions in the basin; changes to the operating conditions in the basin may increase the yield (such as through capturing outflow to the Pacific Ocean through increased production or through increased recharge to the basin) or decrease the yield (such as by increasing outflows to the Pacific Ocean or San Francisco Bay through higher groundwater levels). Simulations indicated that groundwater production could be increased in one portion of the basin if production in adjacent areas is reduced. This is a result of the connectivity of the South Westside Basin aquifer and highlights that the aquifer is a shared resource among all groundwater producers. Due to the connectivity of the aquifer throughout the basin, the basin yield estimate is presented at the scale of the South Westside Basin.

Additional work was performed to estimate the variability of basin yield with respect to hydrology. Historical hydrology during the 1959-2009 time period simulated in the Groundwater Model was analyzed, and it was estimated that wet periods experienced approximately 30 percent more precipitation and dry periods experienced approximately 30 percent less precipitation than the overall average precipitation. Two additional model scenarios were developed, one with precipitation increased 30 percent across the full modeling period and one with precipitation decreased 30 percent across the full modeling period. The same methodology was applied to determine basin yield under these wetter and drier conditions. The estimated wetter period yield is 9,700 AFY and the estimated drier period yield is 7,200 AFY. Given the uncertainty in future hydrology, these values provide a range of yields to be used with the overall estimated basin yield of 8,600 AFY, which is based on historical hydrology.

Figure 3.18 compares the range of basin yield estimates to historical and projected groundwater production, showing that recent production is within the basin yield, although historical production exceeded the basin yield. The production shown in Figure 3.18 includes only production within the area defined for the basin yield estimate (i.e., does not include production in Burlingame and Hillsborough).

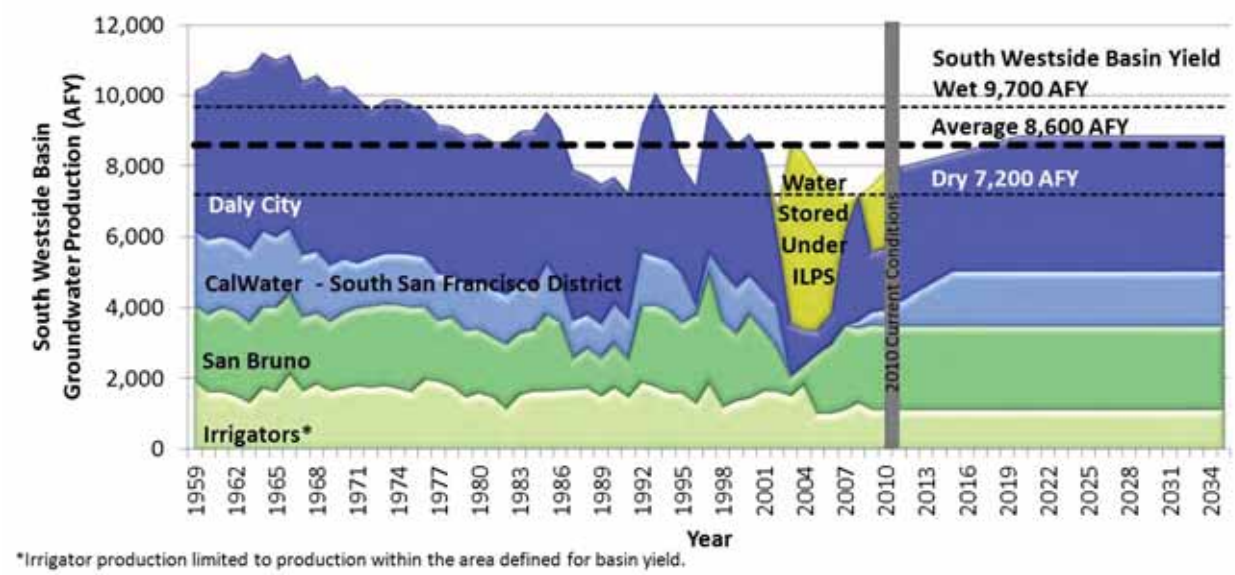



**Figure 3.18**
**Comparison of Basin Yield Estimate and Historical Groundwater Production**

Projected future production for 2020-2035 is 8,881 AFY, slightly above the average basin yield of 8,600 AFY, but within the range of yield.

These estimates are subject to uncertainty inherent in any groundwater model. Regular monitoring of static groundwater levels will assist in determining if groundwater levels are responding as anticipated over the long term.

### 3.5.3 BASIN YIELD USE

The Basin Management Objectives described later in this document are based upon groundwater levels rather than production volumes. As groundwater production is the most significant component of outflow from the basin, an understanding of the basin yield can assist in policy decisions on production which will directly impact groundwater levels in the basin. However, careful consideration must be given before using the basin yield to drive policy decisions.

- First, basin yield is a long-term average annual value. Dry years or other operational needs may require production above the basin yield; this can be acceptable if previous or subsequent years balance production with reduced pumping.
- Second, options to bring the basin into balance with the basin yield include increasing the volume recharged to the aquifer in addition to reducing groundwater production.
- Third, the basin yield is not a static value. Changes in the understanding of the groundwater basin, climate, land use, and location and quantity of groundwater production can all alter the estimate of basin yield. For example, decreasing production may bring production closer to the basin yield, but it will also reduce the basin yield

through reduced capture of additional recharge (less recharge due to higher groundwater levels) and increased natural discharge (more discharge to surface water due to higher groundwater levels). The availability and cost of alternate water supplies or development of recharge projects can also require revisions of the basin yield as this changes the socioeconomic impact of changes in groundwater production.

- Finally, benefits may be seen by approaching the basin yield value, even if the value itself is not met. Additional benefits can also be accrued by pumping significantly below the basin yield, through increasing groundwater levels resulting in increased groundwater in storage, decreased risk of seawater intrusion, and decreased energy costs for groundwater production.

# 4 GOAL AND OBJECTIVES FOR THE BASIN

## 4.1 SOUTH WESTSIDE BASIN GOAL

*The goal of the GWMP is to ensure a sustainable, high-quality, reliable water supply at a fair price for beneficial uses achieved through local groundwater management.*

Sustainable is defined for this GWMP as being able to continue groundwater production over the next 50 years or more with a similar real cost, quantity, and end-user quality as today. Beneficial uses include water supplies for municipal use, irrigation use, private wells, and environmental purposes.

Basin Management Objectives (BMOs) are required by SB 1938 , which amended Section 10753.7of the Water Code to state that groundwater management plans must include BMOs, including components relating to the monitoring and management of groundwater levels within the groundwater basin, groundwater quality degradation, inelastic land surface subsidence, and changes in surface flow and surface water quality that directly affect groundwater levels or quality or are caused by groundwater pumping in the basin.

The following five BMOs are defined to support this goal:

1) Maintain Acceptable Groundwater Levels
2) Maintain or Improve Groundwater Quality
3) Limit the Impact of Point Source Contamination
4) Explore Need for Land Subsidence Monitoring
5) Manage the Interaction of Surface Water and Groundwater for the Benefit of Groundwater and Surface Water Quantity and Quality

In turn, elements needed to meet the BMOs are presented in Section 5 (Elements of the Groundwater Management Plan), and an implementation plan is presented in Section 6 (Implementation) to support the objectives and elements. Together the goal, BMOs, elements, and implementation plan function as the overall groundwater strategy for the South Westside Basin. The BMOs are intended solely for these uses.

## 4.2 BASIN MANAGEMENT OBJECTIVE COMPONENTS

Basin management objectives, are adaptable, quantifiable objectives with prescribed monitoring and defined reporting and responses. These are the accomplishments that need to occur to meet the overall basin goal stated above. BMOs are defined through:

- Management areas and sub-areas
- Public input
- Monitoring
- Adaptive management
- Enforcement

### 4.2.1 MANAGEMENT AREAS AND SUB-AREAS

The management area is the entire Plan Area, as described in Section 1.2 and shown in Figure 1.1. Sub-areas are not needed and not defined because of the continuous nature of the aquifer system. Changes in aquifer characteristics across the South Westside Basin are gradual and are not conducive to defining sub-areas based on physical properties.

Future efforts should evaluate incorporating the North Westside Basin and its associated Sub-Areas and BMOs into a Groundwater Management Plan for the entire Westside Basin. The North Westside Basin is separated from the South Westside Basin only by a jurisdictional boundary (the county line).

### 4.2.2 PUBLIC INPUT

Public input is important in establishing BMOs. Local knowledge is needed to develop appropriate objectives and local acceptance is necessary to ensure implementation. Public input for the BMOs was gathered through Advisory Committee meetings and public meetings, as described in Sections 1.6 and 1.7.

### 4.2.3 MONITORING

Accurate, consistent, and accepted monitoring is necessary to ensure the BMOs are being met. This monitoring will show if objectives, which are quantitative to the extent possible, are being met and will trigger actions if defined thresholds are crossed. The monitoring must allow for quick and easy data sharing among all stakeholders to gain acceptability and to allow for action, if needed, in a timely fashion. Monitoring protocols are described under each BMO, in Section 2.3.12, and in Appendix C.

### 4.2.4 ADAPTIVE MANAGEMENT

Every year brings new data and new conditions to the groundwater aquifer. As such, the BMOs are intended to be flexible and adaptive, allowing for changes due new physical, hydrologic, or operational conditions or new understanding of the physical system. Adjustments to BMOs are discussed in Section 5.7, Reporting and Updating.

### 4.2.5 ENFORCEMENT

In its current form, the GWMP does not have enforcement mechanisms for the BMOs. The BMOs are guidelines to be monitored and reported on for the benefit of all South Westside Basin users. As the BMOs are defined to meet a common goal, the Advisory Committee believes that enforcement will not be necessary. However, future plan revisions may implement enforcement mechanisms if deemed necessary by the Groundwater Task Force.

## 4.3 BASIN MANAGEMENT OBJECTIVES

The BMOs include definitions of acceptable groundwater levels, groundwater quality, land subsidence, and surface water/groundwater interaction, along with actions to be taken if defined triggers are met.

### 4.3.1 MAINTAIN ACCEPTABLE GROUNDWATER LEVELS

The BMO for groundwater levels is designed to maintain operationally acceptable groundwater levels. Operational acceptability is based on avoiding the following infrastructure impacts:

- **Water levels below the top of the existing well screens.** Water levels that are below the top of the screen can negatively impact efficiency of wells through higher incrustation rates, cascading water, and reduced hydraulic efficiency. Several municipal production wells have pumping water levels below the top of the screen under current conditions. Additional lowering of water levels beyond current and historical water levels may adversely impact the ability and cost to pump groundwater, on a case-by-case basis.
- **Water levels below existing pump intakes or bottoms of well screens.** These situations should be avoided whenever possible, as under such conditions groundwater cannot enter the well or cannot be pumped to the surface.

These BMOs are set to maintain conditions for operational purposes; however, they are not currently designed to fully meet the goal of sustainability. Current water levels and water levels meeting the above criteria can remain well below sea level, posing a risk for seawater intrusion. Geologic barriers appear to have thus far prevented seawater from intruding along the Pacific Coast or San Francisco Bay (see Section 2.3.3), but no barrier is perfect and the best way to prevent seawater from migrating into the aquifer is to maintain groundwater levels at or above sea level. Future revisions to this GWMP may seek to raise groundwater level targets to provide a more sustainable water level or may investigate alternate methods of preventing seawater intrusion, such as injection barriers. Such revisions to the GWMP will need to be developed in a manner that can meet the overall goal and will need to function within any then-existing conjunctive use agreements that may require availability of subsurface storage space.

Until then, this BMO will serve as a first step toward managing groundwater levels in the South Westside Basin.

Groundwater level monitoring, triggers, and actions are initially defined below for each well with available data. Note that these items are part of adaptive management of the basin and are thus subject to change as additional data are collected and more information is learned about the basin. This is particularly true for wells with short periods of record, notably the "CUP" wells. The static water level monitoring will monitor progress toward meeting BMOs. Monitoring includes static groundwater level measurements from April (spring) and October (fall) of each year from the designated wells. See details on static water level monitoring protocols are provided in Appendix C

#### 4.3.1.1 Triggers

Groundwater level measurements will be adjusted to reflect conditions without any stored water, determined by modeling results that include conjunctive use projects. Trigger thresholds are developed based on historical water levels as these levels have been considered operationally acceptable by the groundwater producers in the South Westside Basin. The triggers are defined as follows:

- Trigger 1: Groundwater elevations below the historical minimum elevation (more details provided later in this section)
- Trigger 2: Groundwater elevations 10 ft below the historical minimum elevation

Adjustments to water level measurements are needed to account for water stored in the aquifer as part of a conjunctive use study and not part of the native groundwater supply. As this BMO addresses native groundwater, stored GSR Project and ILPS water, which is intended to be recovered, should not be included in BMO monitoring. The adjustment will be made based on differences seen in the Groundwater Model (HydroFocus, 2011) comparing water levels with conjunctive use and without conjunctive use, as shown in the equation below.

$$GWSE_{adjusted} = GWSE_{measured} + GWSE_{modeled,without\ conjunctive\ use} - GWSE_{modeled,with\ conjunctive\ use}$$

where GWSE = groundwater surface elevation

As modeling is required to analyze water levels without the conjunctive use project, reporting will only occur when the Groundwater Model is updated to extend the hydrologic period. It is anticipated that this will occur annually, although biennial updates may be sufficient and may be adopted during implementation. The method of adjustment may be altered if a more accurate and consistent method is identified and accepted by the Groundwater Task Force.

Groundwater level BMO triggers are shown in Table 4.1 based on the hydrographs included in Appendix D. The data presented uses the Groundwater Model to remove the impacts of the In-Lieu Pilot Study (see Section 1.5.3) initiated in 2002 between San Bruno, CalWater, Daly City, and SFPUC. These adjustments are intended solely for the use of BMO development. Trigger 1 for the BMOs is based on the historical low water level without the effects of the ILPS. For wells designated for seawater intrusion monitoring, Trigger 1 is the historical low minus two feet, rounded down. For other wells, Trigger 1 is the historical low minus five feet, rounded down to the nearest five. Trigger 2 is 10 feet below Trigger 1 for all wells. Well locations are shown in Figure 4.1.

#### 4.3.1.2 Actions

If Trigger 1 is met, the Groundwater Task Force will meet to discuss the situation, including confirming the result, an analysis of trends, potential impacts to groundwater producers or the environment, and the most appropriate actions, both immediate and upon Trigger 2 (if met). Actions will be based on plan elements defined in Section 5 (Elements of the Groundwater Management Plan). These actions may include:

- Continued operation
- Conservation measures
- Increased monitoring
- Decreased production, potentially including assignment of pumping thresholds for individual entities
- Accelerated development of artificial or in-lieu recharge projects
- Substitution of alternate supplies
- Reoperation of existing wells or construction of new wells to move production to other parts of the basin

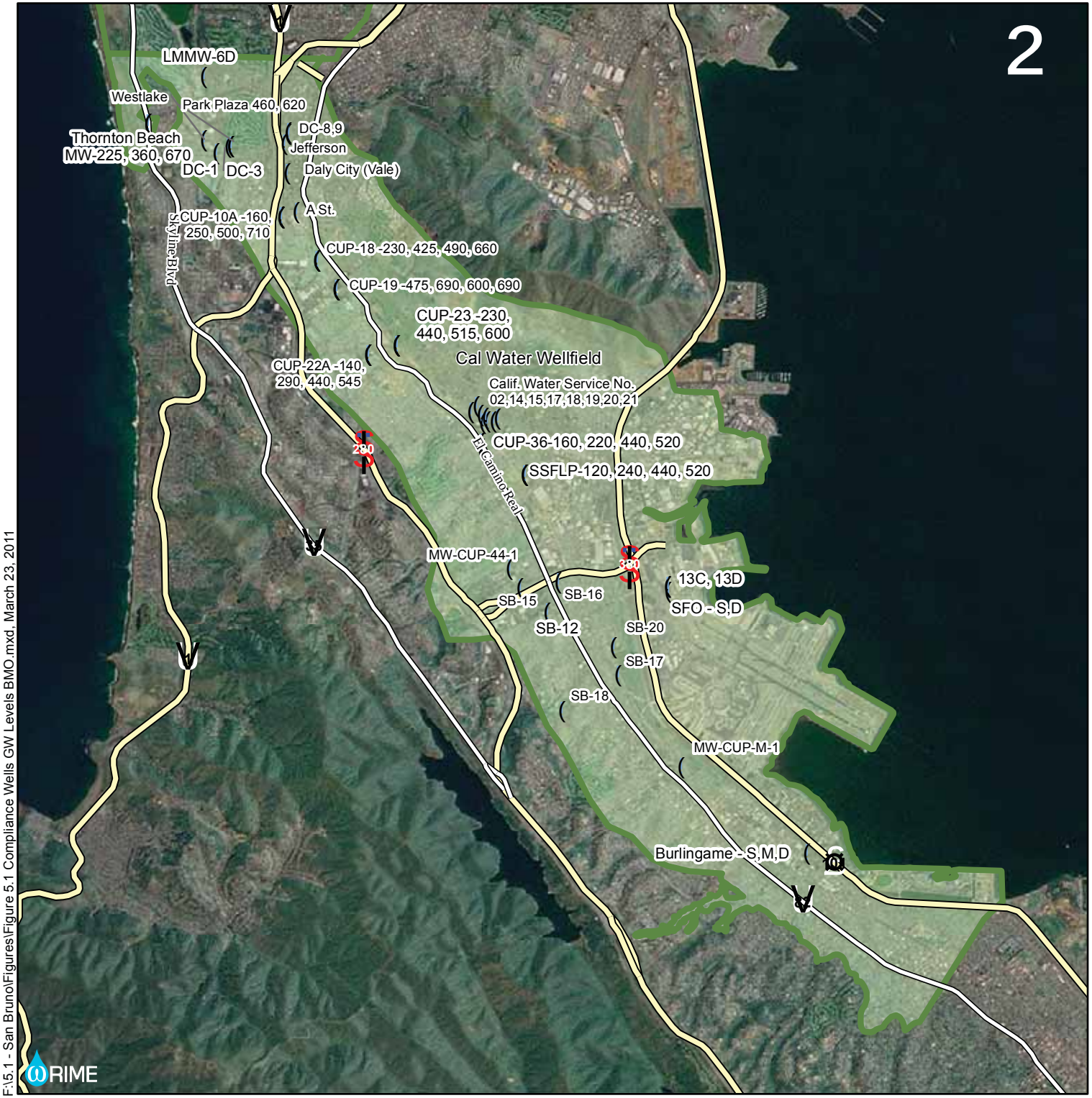
If Trigger 2 is met, the actions defined for Trigger 1, and any additional measures, actions, or mechanisms deemed necessary by the Groundwater Task Force, will be implemented.

**Table 4.1 Groundwater Level BMO Triggers**

| BMO Wells | Well Owner | Trigger 1 Adjusted Static Water Level (feet NAVD88) | Trigger 2 Adjusted Static Water Level (feet NAVD88) |
|---|---|---|---|
| SSF 1-02 | CalWater | -130 | -140 |
| SSF 1-14 | CalWater | n/a | n/a |
| SSF 1-15 | CalWater | n/a | n/a |
| SSF 1-17 | CalWater | n/a | n/a |
| SSF 1-18 | CalWater | n/a | n/a |
| SSF 1-19 | CalWater | n/a | n/a |
| SSF 1-20 | CalWater | -220 | -230 |
| SSF 1-21 | CalWater | n/a | n/a |
| DC-1 (Westlake) | Daly City | -130 | -140 |
| DC-3 | Daly City | n/a | n/a |
| DC-8 | Daly City | -165 | -175 |
| DC-9 | Daly City | n/a | n/a |
| A Street Well | Daly City | n/a | n/a |
| Jefferson Well | Daly City | n/a | n/a |
| Vale Well | Daly City | n/a | n/a |
| Westlake 1 | Daly City | n/a | n/a |
| Westlake 2 | Daly City | n/a | n/a |
| **Burlingame-S*** | **San Bruno** | **-1** | **-14** |
| **Burlingame-M*** | **San Bruno** | **-4** | **-17** |
| **Burlingame-D*** | **San Bruno** | **-7** | **-20** |
| SB-12 | San Bruno | -225 | -235 |
| SB-15 | San Bruno | n/a | n/a |
| SB-16 | San Bruno | n/a | n/a |
| SB-17 | San Bruno | n/a | n/a |
| SB-18 | San Bruno | n/a | n/a |
| SB-20 | San Bruno | n/a | n/a |
| **SFO-S*** | **San Bruno** | **-2** | **-15** |
| **SFO-D*** | **San Bruno** | **-39** | **-51** |
| **13C*** | **UAL** | **-45** | **-57** |
| **13D*** | **UAL** | **-4** | **-16** |
| **Fort Funston-S*** | **USGS** | **2** | **-11** |
| **Fort Funston-M*** | **USGS** | **8** | **-5** |
| Thornton Beach MW 225* | Daly City | 75 | 60 |
| **Thornton Beach MW 360*** | **Daly City** | **11** | **-2** |
| **Thornton Beach MW 670*** | **Daly City** | **9** | **-4** |
| LMMW-6D* | SFPUC | -50 | -60 |

| BMO Wells | Well Owner | Trigger 1 Adjusted Static Water Level (feet NAVD88) | Trigger 2 Adjusted Static Water Level (feet NAVD88) |
|---|---|---|---|
| Park Plaza MW 460* | SFPUC | -120 | -130 |
| Park Plaza MW 620* | SFPUC | -220 | -230 |
| MW-CUP-10A-160* | SFPUC | 55 | 45 |
| MW-CUP-10A-250* | SFPUC | 40 | 25 |
| MW-CUP-18-230* | SFPUC | -70 | -85 |
| MW-CUP-18-425* | SFPUC | -80 | -95 |
| MW-CUP-18-490* | SFPUC | -135 | -150 |
| MW-CUP-18-660* | SFPUC | -180 | -195 |
| MW-CUP-19-180* | SFPUC | Dry Well | Dry Well |
| MW-CUP-19-475* | SFPUC | -150 | -160 |
| MW-CUP-19-600* | SFPUC | -185 | -200 |
| MW-CUP-19-690* | SFPUC | -185 | -200 |
| MW-CUP-22A-140* | SFPUC | Dry Well | Dry Well |
| MW-CUP-22A-290* | SFPUC | -120 | -130 |
| MW-CUP-22A-440* | SFPUC | -145 | -160 |
| MW-CUP-22A-545* | SFPUC | -190 | -200 |
| MW-CUP-23-230* | SFPUC | -115 | -130 |
| MW-CUP-23-440* | SFPUC | -150 | -165 |
| MW-CUP-23-515* | SFPUC | -195 | -210 |
| MW-CUP-23-600* | SFPUC | -190 | -205 |
| MW-CUP-36-160* | SFPUC | -545 | -60 |
| MW-CUP-36-270* | SFPUC | -95 | -105 |
| MW-CUP-36-455* | SFPUC | -195 | -210 |
| MW-CUP-36-585* | SFPUC | -210 | -220 |
| SSFLP-MW120* | SFPUC | -30 | -40 |
| SSFLP-MW220* | SFPUC | -45 | -55 |
| SSFLP-MW440* | SFPUC | -205 | -220 |
| SSFLP-MW520* | SFPUC | -210 | -225 |
| MW-CUP-44-1-190* | SFPUC | -25 | -35 |
| MW-CUP-44-1-300* | SFPUC | -40 | -55 |
| MW-CUP-44-1-460* | SFPUC | -225 | -235 |
| MW-CUP-44-1-580* | SFPUC | -225 | -235 |
| MW-CUP-M-1* | SFPUC | n/a | n/a |

Notes: Wells with thresholds defined as a seawater intrusion monitoring well are shown in **bold**:
n/a: Not available. Triggers are to be developed at a later date for wells with limited data
* Dedicated Monitoring Well




# Figure 4.1
## Wells Monitored for Compliance with Groundwater Levels BMO

**Legend**

- Wells
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

F:\5.1 - San Bruno\Figures\Figure 5.1 Compliance Wells GW Levels BMO.mxd, March 23, 2011

### 4.3.2 MAINTAIN OR IMPROVE GROUNDWATER QUALITY

Maintenance of groundwater quality includes management actions to prevent seawater intrusion as well as impacts of elevated nitrate levels.

#### 4.3.2.1 Seawater Intrusion

While there has been no identified seawater intrusion in the production aquifer to date, the South Westside Basin is at risk for seawater intrusion as groundwater levels throughout the basin are below sea level. Monitoring wells have been installed and are being monitored for seawater intrusion indicators along the Pacific Ocean and along San Francisco Bay. As the monitoring network is not capable of monitoring for all potential seawater intrusion pathways, it is reasonable to expand the seawater intrusion monitoring to include production wells and other monitoring wells. Seawater intrusion indicators include chloride, a conservative constituent in seawater, as well as several ratios of ions that are impacted by ion exchange, dolomitization, adsorption, and other chemical processes as seawater first contacts aquifer materials in equilibrium with fresh water. The indicators include the following:

- Chloride: Chloride concentrations are the most common indicator of seawater intrusion. Chloride concentrations can increase rapidly as high-chloride seawater intrudes into low chloride water in the aquifer and are often the first indicator of seawater intrusion. Chloride can also be of other sources, such as sewage, agricultural return, or water in the soil from the time of formation.
- Chloride/Bromide Ratio: The chloride/bromide ratio can be used to distinguish seawater sources (ratio of approximately 297) from sewage (higher ratio), agriculture (lower ratio), and other sources.
- Sodium/Chloride Ratio: The sodium/chloride ratio can be used as an early indicator of seawater intrusion. Low ratios, lower than seawater (<0.56 weight ratio), can indicate seawater intrusion prior to significant increases in chloride concentrations. This is a result of cation exchange, as sodium replaces calcium on aquifer sediments. If seawater intrusion is in the early stages of progressing, the sodium/chloride ratio should decrease, with a resulting increase in the ratio of both calcium and magnesium to chloride.
- Calcium/Magnesium Ratio and Calcium/(Bicarbonate and Sulfate) Ratio: These ratios can also provide an early indication of seawater intrusion. Ratios greater than 1 can be an early indicator of seawater intrusion. This is a result of dolomitization, which increases calcium concentrations and reduces magnesium concentrations as calcium carbonate (e.g., calcite, limestone) transforms into calcium magnesium carbonate (e.g., dolomite) (Jones et al., 1999).

The approach is based on the level of available data. These ratios are used in other basins to study seawater intrusion, along with other ratios and stable isotope analyses. In the Central and West Coast Basins of Los Angeles County, chloride and TDS concentrations; ratios of chloride to bromide, iodide, and boron; isotopic data; age dating; and borehole data are used to assess saline groundwater (Land, et al., 2004). Seawater intrusion analysis in the Seaside Basin of Monterey County utilizes chloride concentrations, sodium/chloride ratios, other cation/anion ratios, geophysical logs, and analysis of groundwater levels (HydroMetrics, 2011). In the San Leandro and San Lorenzo areas of Alameda County, ratios of chloride to bromide, iodide, barium, and boron are used along with chloride concentrations, noble gasses and isotopic data to study seawater intrusion (Izbicki et al, 2003).

Annual monitoring will include pumping and static water level measurements and sampling for the following analytes:

| | | | |
|---|---|---|---|
| Alkalinity | Ortho-phosphate | Calcium | Conductivity |
| Bromide | Sulfate | Magnesium | pH |
| Chloride | Total Dissolved Solids | Potassium | Total Bicarbonate |
| Nitrate | Boron | Sodium | Iron and Manganese |

#### *4.3.2.1.1 Triggers*

With the exception of chloride, thresholds are not set for each indicator as the magnitude and timing of each requires analysis prior to making decisions on the status of the South Westside Basin. Chloride thresholds are necessary as the first signs of seawater intrusion need to be recognized rapidly to protect the overall water quality. Thresholds are set at approximately 10 percent above the historical maximum concentration over the past twenty years of sampling (1991 – 2010, with probable outliers removed). This allows for variability inherent in sampling and analytical testing, but will signal potential issues should concentrations increase. Additional information on seawater intrusion parameters for a selection of these wells is presented in Appendix E. Chloride thresholds for each well are presented in Table 4.2. Note that these thresholds are part of adaptive management of the basin and are thus subject to change as additional data are collected and more information is learned about the basin. This is particularly true for wells with short periods of record, notably the "CUP" wells. The well locations are shown in Figure 4.2. The SMCL for chloride is 250 mg/l (recommended), 500 mg/l (upper) and 600 mg/l (short-term).

Regular analysis of water quality and water level data will allow for identification of data gaps that may require installation of new monitoring wells at new locations and/or new depth intervals, geophysical testing, or more rigorous chemical and isotope analysis.

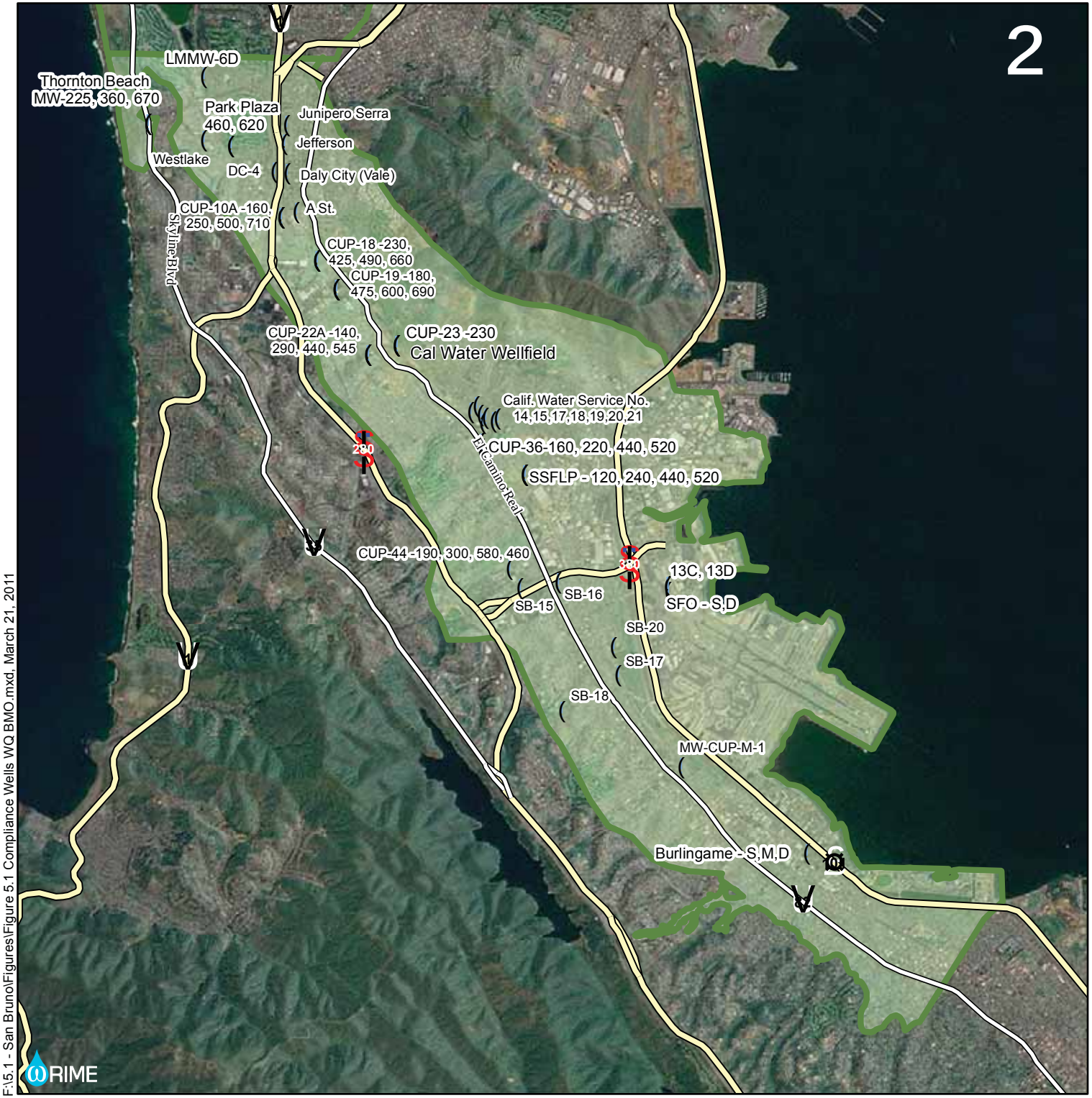
**Table 4.2 Seawater Intrusion BMO Chloride Thresholds (mg/l)**

| Well | Chloride Threshold | Recent Result | 1991-2010 Maximum |
|---|---|---|---|
| Burlingame-S | 570 | 430 | 518 |
| Burlingame-M | 90 | 63 | 79 |
| Burlingame-D | 55 | 41 | 47 |
| SB-15 | 160 | 110 | 145 |
| SB-16 | 170 | 110 | 154 |
| SB-17 | 65 | 58 | 58 |
| SB-18 | 80 | 70 | 72.5 |
| SB-20 | 100 | 84 | 88 |
| SSF 1-14 | 145 | 123 | 129 |
| SSF 1-15 | 150 | 110 | 135 |
| SSF 1-17 | 115 | 103 | 103 |
| SSF 1-18 | 100 | 65 | 91 |
| SSF 1-19 | 135 | 120 | 122 |
| SSF 1-20 | 185 | 140 | 167 |
| SSF 1-21 | 215 | 180 | 196 |
| MW-CUP-M1 | 60 | 51 | 51 |
| MW-CUP-10A-160 | 145 | 128 | 128 |
| MW-CUP-10A-250 | 145 | 128 | 128 |
| MW-CUP-18-230 | 100 | 90 | 90 |
| MW-CUP-18-425 | 100 | 91 | 91 |
| MW-CUP-18-490 | 100 | 90 | 90 |
| MW-CUP-18-660 | n/a | n/a | n/a |
| MW-CUP-19-180 | n/a | n/a | n/a |

| | | | |
|---|---|---|---|
| MW-CUP-19-475 | 110 | 99 | 99 |
| MW-CUP-19-600 | 105 | 95 | 95 |
| MW-CUP-19-690 | 180 | 160 | 160 |
| MW-CUP-22A-140 | n/a | n/a | n/a |
| MW-CUP-22A-290 | 120 | 106 | 106 |
| MW-CUP-22A-440 | 80 | 71 | 71 |
| MW-CUP-22A-545 | 120 | 106 | 106 |
| MW-CUP-23-230 | n/a | n/a | n/a |
| MW-CUP-23-440 | n/a | n/a | n/a |
| MW-CUP-23-515 | n/a | n/a | n/a |
| MW-CUP-23-600 | n/a | n/a | n/a |
| MW-CUP-36-160 | 125 | 110 | 110 |
| MW-CUP-36-270 | 130 | 118 | 118 |
| MW-CUP-36-455 | 90 | 81 | 81 |
| MW-CUP-36-585 | 205 | 186 | 186 |
| MW-CUP-44-1-190 | 80 | 69 | 69 |
| MW-CUP-44-1-300 | 95 | 84 | 84 |
| MW-CUP-44-1-460 | 150 | 134 | 134 |
| MW-CUP-44-1-600 | 95 | 85 | 85 |
| SSFLP-MW120 | 200 | 173 | 180 |
| SSFLP-MW220 | 115 | 100 | 104 |
| SSFLP-MW440 | 75 | 61 | 65 |
| SSFLP-MW520* | 125 | 107 | 110 |
| Park Plaza MW 620* | 175 | 143 | 155 |
| Park Plaza MW 460 | n/a | n/a | n/a |
| LMMW-6D | n/a | n/a | n/a |

| | | | |
|---|---|---|---|
| Thornton Beach MW 225 | n/a | n/a | n/a |
| Thornton Beach MW 360 | n/a | n/a | n/a |
| Thornton Beach MW 670 | n/a | n/a | n/a |
| A-Street | 165 | 88 | 150 |
| Jefferson | 135 | 58 | 120 |
| Junipero Serra | 55 | 50 | 50 |
| Vale | 80 | 67 | 71 |
| No. 4 Citrus | 85 | 61 | 76 |
| Westlake | 200 | 99 | 180 |
| SFO-S | 13,600 | 10,000 | 12,400 |
| SFO-D | 605 | 550 | 550 |

Note: n/a: Not available; triggers are to be developed at a later date for wells with limited data




# Figure 4.2
## Wells Monitored for Compliance with Groundwater Quality BMO

**Legend**

- Wells
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

F:\5.1 - San Bruno\Figures\Figure 5.1 Compliance Wells WQ BMO.mxd, March 21, 2011

##### *4.3.2.1.2 Actions*

If the trigger threshold is met, the Groundwater Task Force will meet to discuss the situation, including confirming the result, an analysis of trends, analysis of other seawater intrusion indicators including analytical results and water level measurements, potential impacts to groundwater users or the environment, and the most appropriate actions.

If confirmed, analysis should be initiated to determine if the elevated value is likely the result of seawater intrusion, upconing of deep saline water, or other sources. Actions will be based on plan elements defined in Section 5, Elements of the Groundwater Management Plan. These actions may include:

- Continued operation
- Increased monitoring
- Studies of sources of chloride (seawater intrusion or upconing from deeper sediments) and additional options to manage water quality
- Reoperation or new wells to move production to other parts of the basin or different depths
- Decreased production to reduce seawater intrusion or upwelling
- Substitution of alternate supplies

#### 4.3.2.2 Nitrate

Elevated nitrate levels in portions of the basin have become an increasing concern over the past several years. Although concentrations have largely remained below MCLs, individual wells have shown sudden increases and trends suggest possible issues in the future. The source of nitrate in the basin has not been studied, but historical and current land use point to either previous agricultural land uses, including extensive cattle operations, or current urban and turf-grass uses. If trends continue, work may be needed to identify the source and to determine how the region could keep nitrate levels within desired levels, potentially through development of a salt and nutrient management plan or through other studies. .

##### *4.3.2.2.1 Triggers*

This section defines nitrate monitoring, triggers, and actions on a well-by-well basis. Monitoring is based on existing DPH data collection efforts and local sampling of monitoring wells. Trigger 1 is based on 80 percent of the MCL, 36 mg/l, and Trigger 2 is based on 90 percent of the MCL, 41 mg/l.

It should be noted that data presented in this section is representative of raw water quality. Raw water quality is different from the water served to customers, as water purveyors pump

selectively from wells based on quality and provide blended water from both groundwater and surface water sources to maintain a safe water supply in compliance with state and federal regulations.

Future nitrate monitoring should proceed annually, unless trends or levels indicate a need for more frequent measurements.

##### *4.3.2.2.2 Actions*

If Trigger 1 is met for one or more wells, the Groundwater Task Force will meet to discuss the situation, including confirming the result, an analysis of trends, potential impacts to groundwater users or the environment, and the most appropriate actions, both immediate and upon Trigger 2 (if met). The Groundwater Task Force will consider the status of all wells, including the wells below the trigger threshold, the quantity and quality of other supply sources for blending, and will also consider water level data and other environmental and operational factors that could contribute to increases in nitrate concentrations. Actions will be based on the plan elements and programs defined in Section 5, Elements of the Groundwater Management Plan.

If Trigger 2 is met, the actions defined for Trigger 1 and any additional measures, actions, or mechanisms deemed necessary by the Groundwater Task Force will be implemented.

Historical estimates of nitrate concentrations and current groundwater quality BMO trigger status are shown in Table 4.3. Note that the triggers are part of adaptive management of the basin and are thus subject to change as additional data are collected and more information is learned about the basin. This is particularly true for wells with short periods of record, notably the “CUP” wells.

**Table 4.3 Groundwater Quality BMO Triggers**

| Well | 1991-2010 Maximum Nitrate (as NO3) Concentration (mg/l) | Recent Nitrate (as NO3) Concentration (mg/l) | Trigger Status |
|---|---|---|---|
| Burlingame-S | < 1 | ND | |
| Burlingame-M | ND | ND | |
| Burlingame-D | 1 | 1 | |
| SB-15 | 15 | 5 | |
| SB-16 | 8 | ND | |
| SB-17 | 6 | 5 | |
| SB-18 | 7 | 7 | |
| SB-20 | 7 | 1 | |
| 01-14 | 82 | 76 | Trigger 2 |
| 01-15 | 32 | 18 | |
| 01-17 | 222 | 219 | Trigger 2 |
| 01-18 | 85 | 76 | Trigger 2 |
| 01-19 | 60 | 35 | |
| 01-20 | 104 | 4 | |
| 01-21 | 3 | ND | |
| MW-CUP-M1 | 12 | 12 | |
| MW-CUP-10A-160 | 35 | 35 | |
| MW-CUP-10A-250 | 48 | 48 | Trigger 2 |
| MW-CUP-10A-500 | 36 | 36 | Trigger 1 |
| MW-CUP-10A-710 | | | |
| MW-CUP-18-230 | 7 | 7 | |
| MW-CUP-18-425 | 8 | 8 | |
| MW-CUP-18-490 | 2 | 2 | |
| MW-CUP-18-660 | | | |
| MW-CUP-19-180 | | | |

| Well | 1991-2010 Maximum Nitrate (as NO3) Concentration (mg/l) | Recent Nitrate (as NO3) Concentration (mg/l) | Trigger Status |
|---|---|---|---|
| MW-CUP-19-475 | 1 | 1 | |
| MW-CUP-19-600 | ND | ND | |
| MW-CUP-19-690 | ND | ND | |
| MW-CUP-22A-140 | | | |
| MW-CUP-22A-290 | 33 | 33 | |
| MW-CUP-22A-440 | 1 | 1 | |
| MW-CUP-22A-545 | 24 | 24 | |
| MW-CUP-23-230 | | | |
| MW-CUP-23-440 | | | |
| MW-CUP-23-515 | | | |
| MW-CUP-23-600 | | | |
| MW-CUP-36-160 | 26 | 26 | |
| MW-CUP-36-270 | 8 | 8 | |
| MW-CUP-36-455 | ND | ND | |
| MW-CUP-36-585 | ND | ND | |
| MW-CUP-44-1-190 | 35 | 35 | |
| MW-CUP-44-1-300 | 37 | 37 | Trigger 1 |
| MW-CUP-44-1-460 | 2 | 2 | |
| MW-CUP-44-1-600 | ND | ND | |
| SSFLP-MW120 | ND | ND | |
| SSFLP-MW220 | 1 | 1 | |
| SSFLP-MW440 | ND | ND | |
| SSFLP-MW520* | ND | ND | |
| Park Plaza MW 620* | 1 | < 1 | |
| Park Plaza MW 460* | | | |
| LMMW-6D | | | |

| Well | 1991-2010 Maximum Nitrate (as NO3) Concentration (mg/l) | Recent Nitrate (as NO3) Concentration (mg/l) | Trigger Status |
|---|---|---|---|
| A-Street | 170 | 98 | Trigger 2 |
| Jefferson | 31 | 10 | |
| Vale | 46 | 35 | |
| No. 4 Citrus | 71 | 63 | Trigger 2 |
| Westlake | 61 | 33 | |
| Junipero Serra | 47 | 34 | |
| SFO-S | 8 | ND | |
| SFO-D | ND | ND | |

Note: Blanks: Triggers are to be developed at a later date for wells with limited data

### 4.3.3 LIMIT THE IMPACT OF POINT SOURCE CONTAMINATION

Point source contamination can also threaten water supplies in the South Westside Basin. Loss of a portion of the water supply due to point source contamination would require use of alternate supplies, which are limited. The point source contamination BMO seeks to coordinate with regulatory agencies to ensure potential impacts to water supplies and environmental receptors are fully incorporated into remedial actions and monitoring programs at contaminated sites. The BMO recognizes that clay layers only slow the migration of contaminants and that these contaminants, if not properly remediated, may reach the primary production aquifer at some concentration at some point in the future.

No quantitative thresholds are set for this BMO as there are numerous potential contaminants; however, a qualitative objective of limiting the impact of point source contamination is defined through identifying and protecting areas of basin recharge, ensuring rapid response to new detections of contaminants at any well, and fully cleaning up contaminated sites, including perched aquifer systems that eventually recharge the deeper aquifer used for water supplies. Full cleanup may be through remediation programs or natural processes. The following are actions to achieve this BMO:

- Use basin understanding and the existing Groundwater Model to identify important areas of basin recharge. Identify appropriate measures to protect those areas.
- Actively engage with regulatory agencies and potentially responsible parties on existing sites.

- Notify regulators of contamination issues in wells, even for low-level detections, to ensure discovery of new problems as quickly as possible.
- Coordinate with land use planners to ensure land uses are suitable for land overlying the aquifer.

### 4.3.4 Explore Need for Land Subsidence Monitoring

The land subsidence BMO focuses on increased understanding of the possible problem through potential additional monitoring activities. There has been no evidence of historical land subsidence, even though water levels have declined significantly from pre-development levels. Land subsidence is most rapid immediately after the initial dewatering of sediments. Thus, land subsidence is not anticipated from sediments that have been historically dewatered. Should water levels decline in the future, it is unlikely that subsidence would occur as these materials are similar to those historically dewatered and would likely exhibit similar limited compressibility.

However, without any previous studies of subsidence, there is a potential that land subsidence may have occurred unnoticed or that deeper materials may behave differently. As such, there is a need to perform a subsidence study to assess the status of the subsidence in the South Westside Basin.

Interferometric synthetic aperture radar (InSAR) studies are included in the implementation of the plan. The results of the InSAR study may confirm that no land subsidence is occurring in the South Westside Basin, or could show the need for more formalized monitoring and development of quantitative BMOs, which may be established under the reporting and updating element contained in Section 5.7, Reporting and Updating.

### 4.3.5 Manage the Interaction of Surface Water and Groundwater for the Benefit of Groundwater and Surface Water Quantity and Quality

This BMO seeks to manage changes in surface flow and surface water quality and quantity that directly affect groundwater levels or quality or are caused by groundwater production in the basin. As discussed in Section 2.3.10, there is little interaction between surface water and groundwater in the South Westside Basin. Colma Creek is the largest surface water feature, but it is relatively small and lined for most reaches. Other creeks are very small and drain local watersheds.

No quantitative thresholds are set for this BMO, however, the following qualitative objectives of maintaining or improving the interaction of surface water and groundwater are set:

- Maintain natural watercourses and investigate potential benefits of removing lining from watercourses where feasible.

- Maintain baseflow in creeks.
- Monitor groundwater levels to assist in water level studies at Lake Merced in San Francisco County in the North Westside Basin.

# 5 ELEMENTS OF THE GROUNDWATER MANAGEMENT PLAN

California Water Code section 10753.8 states that a GWMP may include components relating to all of the following:

- Control of saline water intrusion
- Identification and management of wellhead protection areas and recharge areas
- Regulation of migration of contaminated groundwater
- Administration of a well abandonment and well destruction program
- Mitigation of overdraft conditions
- Replenishment of groundwater extracted by water producers
- Monitoring of groundwater levels and storage
- Facilitation of conjunctive use operations
- Identification of well construction policies
- Construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects
- Development of relationships with state and federal regulatory agencies
- Review of land use plans and coordination with land use planning agencies to assess activities that create a reasonable risk of groundwater contamination

These items are grouped and related back to the South Westside Basin GWMP goal and objectives in Table 5.1 and discussed in the following sections. Some of the items below call for consideration, evaluation, and the potential implementation of measures to address conditions in the groundwater basin. These items are intended to address goals and objectives of the GWMP, but do not propose specific actions or projects that might be developed on a case-by-case basis, as needed. Such specific actions or projects are not fully known at this time and may be subject to evaluation, including but not limited to environmental review, when and if proposed for implementation, and may require approval by regulatory agencies with jurisdiction over the proposed action following completion of any required environmental review.

**Table 5.1**
**Summary of GWMP Objectives and Elements**

| Item | BMOs | | | | |
|---|---|---|---|---|---|
| | Maintain Acceptable Groundwater Levels | Maintain or Improve Groundwater Quality | Limit the Impact of Point Source Contamination | Explore the Need for Land Subsidence Monitoring | Manage Interaction of Surface Water And Groundwater |
| **Stakeholder Involvement** | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Monitoring and Management** | | | | | |
| Monitoring of groundwater levels and storage | ✓ | | ✓ | | ✓ |
| Monitoring of groundwater quality | | ✓ | ✓ | | ✓ |
| Monitoring of inelastic land subsidence | | | | ✓ | |
| Monitoring of surface water/groundwater interaction | ✓ | ✓ | | | ✓ |
| **Groundwater Storage** | | | | | |
| Mitigation of overdraft conditions | ✓ | ✓ | | | ✓ |
| Replenishment of groundwater extracted by water producers | ✓ | ✓ | | | ✓ |
| Facilitation of conjunctive use operations | ✓ | ✓ | | | ✓ |
| **Groundwater Quality** | | | | | |
| Control of saline water intrusion | | ✓ | | ✓ | ✓ |
| Identification and management of wellhead protection areas and recharge areas | ✓ | ✓ | ✓ | ✓ | ✓ |
| Regulation of migration of contaminated groundwater | | ✓ | ✓ | ✓ | ✓ |
| Administration of a well abandonment and well destruction program | | ✓ | ✓ | ✓ | ✓ |
| Identification of well construction policies | | ✓ | ✓ | ✓ | ✓ |
| **Construction and operation by the local agency of groundwater contamination cleanup, recharge, storage, conservation, water recycling, and extraction projects** | ✓ | ✓ | ✓ | ✓ | ✓ |
| **Coordinated Planning** | | | | | |
| Development of relationships with state and federal regulatory agencies | ✓ | ✓ | ✓ | ✓ | ✓ |
| Coordination with IRWMP efforts | ✓ | ✓ | ✓ | ✓ | ✓ |
| Review of land use plans and coordination with land use planning agencies to assess activities that create a reasonable risk of groundwater contamination | ✓ | ✓ | ✓ | | ✓ |
| **Reporting and Updating** | ✓ | ✓ | ✓ | ✓ | ✓ |

## 5.1 STAKEHOLDER INVOLVEMENT

Ongoing stakeholder involvement is critical to successful implementation of the GWMP. Interested parties include agencies within and near the South Westside Basin, environmental interests, and individuals and companies that rely on the groundwater basin for water supply. Coordination with these groups is necessary to ensure that goals and objectives continue to be consistent with the desires of the community; that a full range of alternatives are considered along with potential adverse impacts; and that progress can be made toward meeting the goal and objectives.

**Actions**

*A1. Distribute the GWMP in an electronic format to all parties that have expressed interest in the plan, including all agencies within and bordering the basin.*

*A2. Hold Groundwater Task Force (see Section 6.1) meetings on a semi-annual basis to discuss ongoing groundwater management issues and activities. These discussions will include other agencies, thus enabling cooperation between public entities whose service areas or boundaries overlie the groundwater basin. Meetings will focus on progress towards meeting BMOs, implementation of projects in this plan, new or updated status on the condition of the groundwater basin, and new or updated plans or strategies.*

*A3. Continue outreach to private groundwater producers, notably cemeteries, to involve these stakeholders in the ongoing groundwater management process.*

*A4. Reorient the GWMP web site from its current plan-development focus to an implementation focus, highlighting implementation activities and soliciting public input.*

*A5. Present actions implemented by the agencies at public meetings of the respective councils.*

*A6. Provide public notice for any revisions to the GWMP.*

## 5.2 MONITORING AND MANAGEMENT

Elements pertaining to Monitoring and Management of the South Westside Basin relate to groundwater levels and storage; groundwater quality; inelastic land subsidence; and changes in surface flow and surface water quality that directly affect groundwater levels or quality or are caused by groundwater pumping.

### 5.2.1 GROUNDWATER LEVELS AND STORAGE

The South Westside Basin needs additional groundwater level and quality monitoring to meet the objectives of this plan and the needs of the individual water agencies. Monitoring protocols

are included in Appendix C. Coordination among the agencies is necessary to make existing and future monitoring as complete as possible with respects to spatial distribution and timing.

Figure 5.1 shows all wells in the South Westside Basin with static water level measured at least once in 2009. Water level data are taken regularly by the water agencies, but typically static water levels are only taken when pumps are not operating due to maintenance activities. There is no existing basin-wide static groundwater level monitoring program.

To the extent possible, groundwater level monitoring should continue at all wells that are currently or have recently been measured, as shown in Figure 5.1. Water levels should be measured minimally in the spring (April) and fall (October). Datalogging pressure transducers should be installed in selected wells to determine variability between readings, which may refine future timing of groundwater level measurements. Measurements should be taken when the well and, to the extent possible, nearby wells are not pumping, to represent static water levels. In addition to the measurement, the pumping status at the well and nearby wells should be noted and preserved in the database. Additional monitoring details are provided in Appendix C.

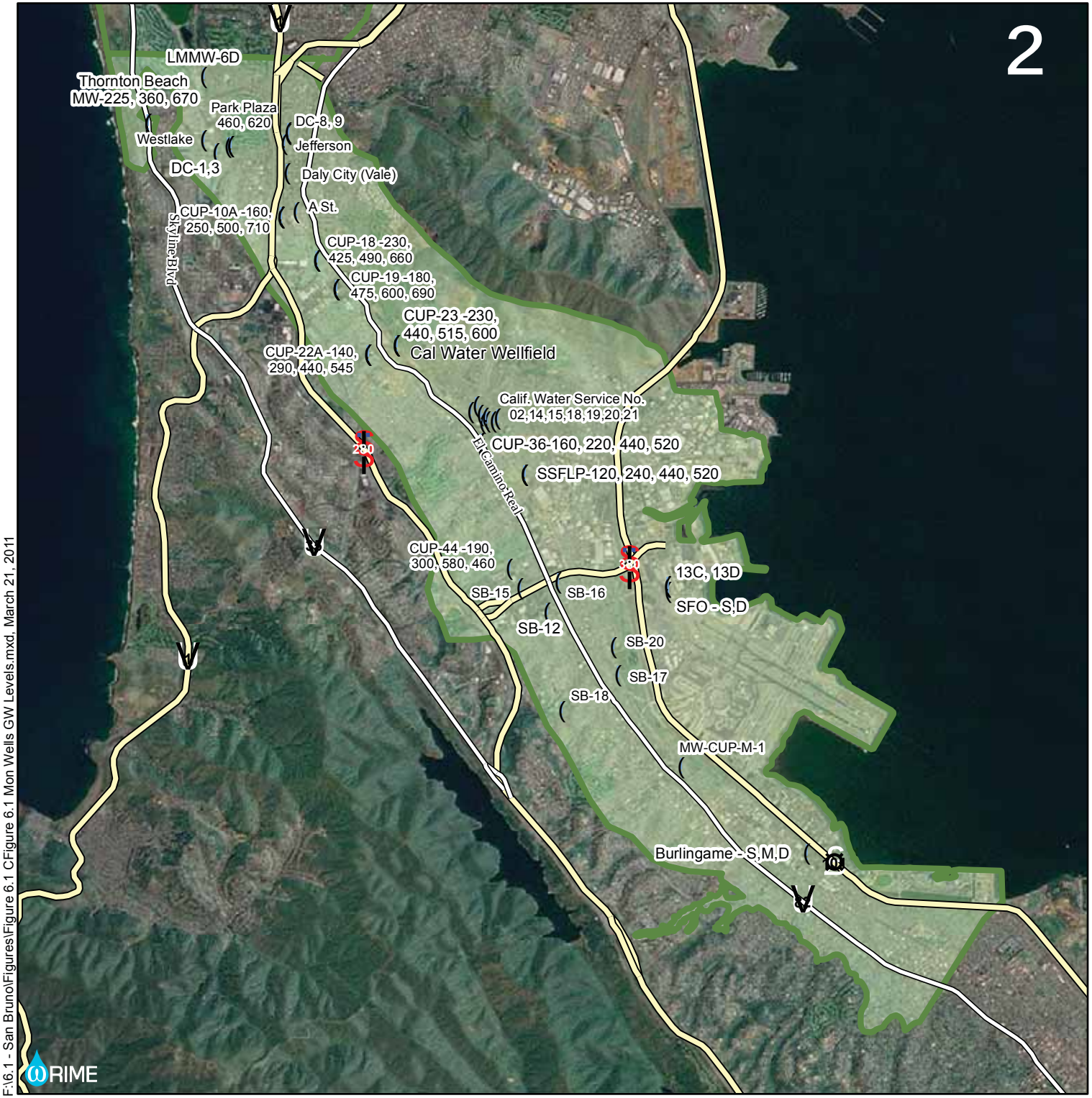
Groundwater level monitoring should be coordinated with the California Statewide Groundwater Elevation Monitoring (CASGEM) program, a statewide groundwater elevation monitoring program that is intended to track seasonal and long-term trends in groundwater elevations in California's groundwater basins. Daly City, CalWater, and San Bruno, through the South Westside Basin Voluntary Cooperative Groundwater Monitoring Association, are the monitoring entities for the portion of the South Westside Basin within their service area. Coordination with CASGEM should include consistent monitoring protocols between data provided to the CASGEM program and other data collected in the basin.

A key element of monitoring and management of groundwater levels and storage is the Groundwater Model. The Groundwater Model is used primarily to improve the understanding of the groundwater system, but also is useful for the following:

- Aggregating, organizing, and analyzing existing data
- Identifying data gaps
- Simulating impacts on groundwater levels and storage of various projects and of continuation of existing operations

The Groundwater Model is available for use by all interested stakeholders from Daly City. Output from the model may be used in GWMP implementation to ensure that projects are designed to meet the stated goal and objectives.

These activities result in a significant amount of data. Usage of a data management system, such as the existing HydroDMS, can assist in storing, accessing, and analyzing data across multiple agencies.




# Figure 5.1
## Wells Monitored for Groundwater Levels

**Legend**

- Wells
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

F:\6.1 - San Bruno\Figures\Figure 6.1 CFigure 6.1 Mon Wells GW Levels.mxd, March 21, 2011

**Actions**

*B1. Implement a basin-wide semi-annual static water level measurement program that builds upon existing monitoring. The program should include the wells belonging to the retail water agencies. Other wells may be included if feasible.*

*B2. Use existing database structures with data from these databases imported into a central Data Management System (such as the existing HydroDMS) to facilitate data sharing between agencies.*

*B3. Coordinate among agencies to ensure that wells continue to be monitored to provide long-term records of water levels at specific locations, and to ensure a consistent and, to the extent feasible, complete dataset.*

*B4. Participate in the CASGEM program.*

### 5.2.2 GROUNDWATER QUALITY

Water quality monitoring is performed for Title 22 compliance by the water agencies. Figure 5.2 shows the locations of wells monitored for water quality at least once in the most recent 5-year period with available data from DPH (2006 – 2010) or other local monitoring activity. Monitoring protocols are contained in Appendix C. Additional water quality monitoring is needed to ensure sufficient data to define nitrate concentrations for use by the water quality BMOs in this GWMP.

**Actions**

*C1. Continue groundwater quality monitoring as needed to meet Title 22 requirements.*

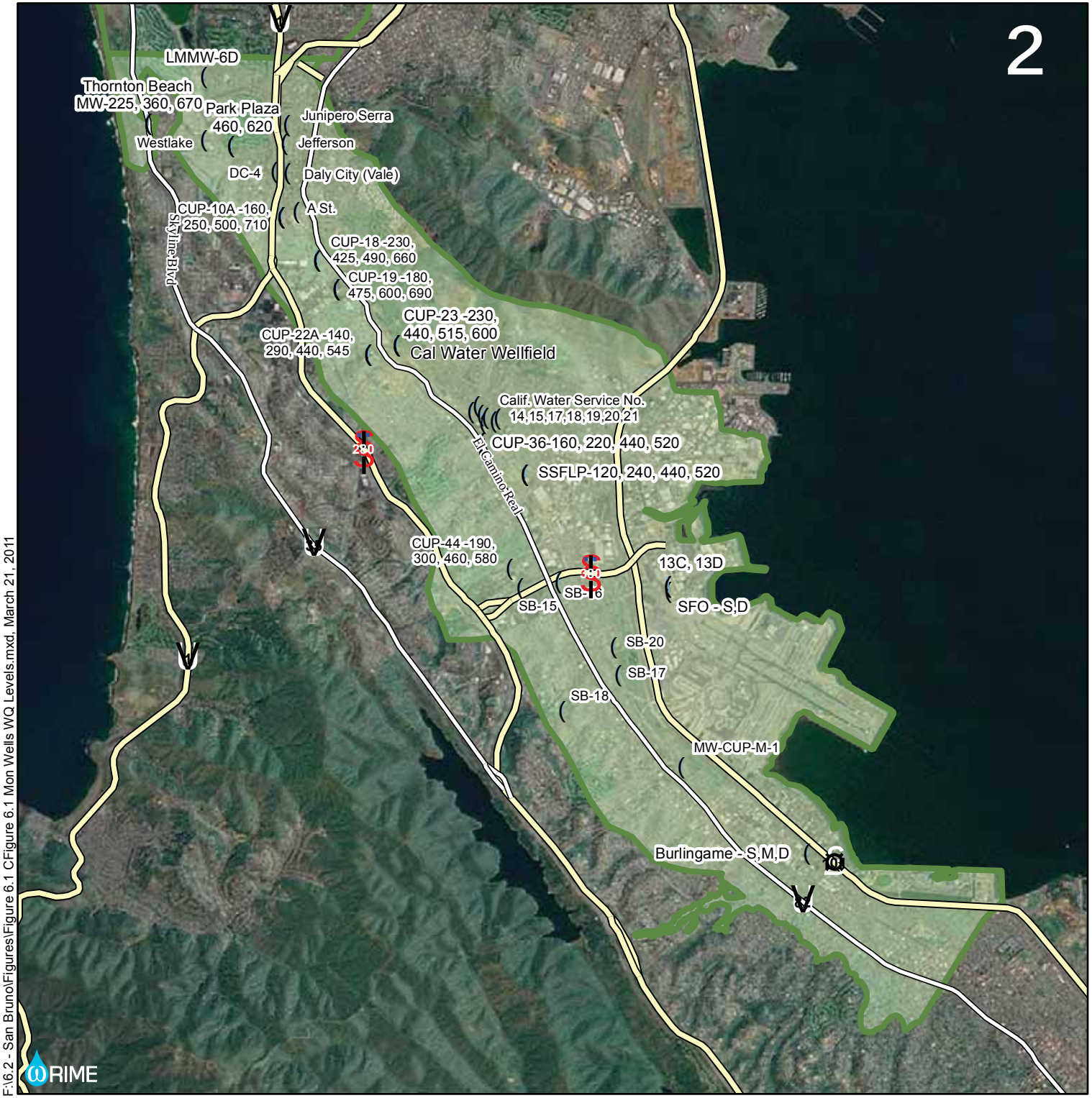
*C2. Standardize data collection protocols and timing through coordination among agencies.*

*C3. Continue to use existing database structures, with data from these databases imported into a central Data Management System (such as the existing HydroDMS).*

*C4. Fill gaps in the water quality monitoring network through sampling additional existing or newly constructed monitoring wells.*

*C5. Coordinate with the USGS on its National Ambient Water Quality Assessment (NAWQA) program and GAMA program to potentially integrate its efforts with local monitoring efforts.*

*C6. Consider development of a Salt and Nutrient Management Plan to assist in permitting of future recycled water projects.*




# Figure 5.2
## Wells Monitored for Groundwater Quality

**Legend**

- Wells
- Highways
- Groundwater Basin
- Plan Area

0 0.5 1 2 Miles

F:\6.2 - San Bruno\Figures\Figure 6.1 CFigure 6.1 Mon Wells WQ Levels.mxd, March 21, 2011

### 5.2.3 INELASTIC LAND SUBSIDENCE

Monitoring land subsidence in the South Westside Basin is limited by the cost of traditional surveys and extensometer compared to the limited historical impact of subsidence in the basin. If land subsidence is reported in the area, or if water levels drop below historical lows, additional land subsidence monitoring will be considered. Relatively new technology, InSAR, allows for more cost-effective, regional scale land subsidence monitoring. Over time, these technologies are becoming more powerful and less expensive. Lower costs and opportunities to partner with others such as USGS may allow for land subsidence monitoring in the future.

**Actions**

*D1. Collect evidence, if any, of active inelastic land subsidence and assess the risk.*

*D2. Develop a land subsidence monitoring program, if needed, using InSAR or traditional surveying and extensometer methods.*

*D3. Partner with the USGS or nearby agencies to implement any needed monitoring.*

### 5.2.4 CHANGES IN SURFACE FLOW AND SURFACE WATER QUALITY THAT DIRECTLY AFFECT GROUNDWATER LEVELS OR QUALITY OR ARE CAUSED BY GROUNDWATER PUMPING

Surface flow within the South Westside Basin is minimal, primarily Colma Creek and other small creeks, as discussed in Section 2. However, Lake Merced is a significant water body with recreational uses to the north in the North Westside Basin. This GWMP intends to support the actions developed under the North Westside Basin GWMP through coordination with that plan during development and updates. The action listed below are reflective of the actions of the North Westside GWMP.

**Action**

*E1. Continue groundwater monitoring near Lake Merced to support ongoing studies.*

## 5.3 GROUNDWATER STORAGE

### 5.3.1 MITIGATION OF OVERDRAFT CONDITIONS

The South Westside Basin is currently considered not to be in a state of overdraft. Current pumping is estimated to be approximately at the basin yield, as estimated by the Westside Basin Groundwater-Flow Model (Hydrofocus, 2011). However, historical groundwater production has at times exceeded the basin yield, which has resulted in groundwater levels well below sea level. The groundwater level BMO is intended to serve as a prevention, coordination, and warning device.

Currently, the decisions and plans on groundwater production are made independently by each agency based on each agency's individual needs in coordination with the respective surface

water supplies from the SFPUC. Under current basin management, there is little or no coordination among the agencies on the individual agency or total production from the basin. To manage the basin in a more robust and sustainable manner, there is a need to coordinate groundwater production among the agencies, along with appropriate level of monitoring and reporting of groundwater production, levels, and quality. This information can be used in several aspects of basin management, including:

- Keeping the Westside Basin Groundwater-Flow Model updated and using the model to evaluate the impact of collective production in comparison to the basin yield. In addition to investigating basin-wide conditions, the model can also provide details on the impact of the geographic distribution of production throughout the basin, so as to assist in managing the basin in a more sustainable manner. While more detailed analyses typically have higher uncertainties than regional analyses, they can provide information on estimated changes in the basin operations that can assist in groundwater management strategies.
- Updating the basin yield estimates over time as better data becomes available, and as operation of the basin evolves into a more coordinated manner. As a result, and in order to address any potential basin yield issues, there may be a need in the future to evaluate additional recharge opportunities or apportion production to each agency through voluntary agreements to assist in meeting groundwater level BMOs. Appropriate monitoring and robust modeling tools will assist in evaluating basin management options and safe yield should that become necessary in the future.

**Actions**

*F1. Should groundwater levels decline, analyze conditions to determine if the South Westside Basin is in overdraft or if conditions are due to short-term climatic variability or other factors. Analysis will include the use of the most up-to-date groundwater model.*

*F2. Should overdraft conditions occur, actions may include demand reduction through alternate supplies or conservation programs and increased recharge activities through in-lieu or direct recharge.*

*F3. Implement a voluntary groundwater pumping metering program for private wells, such as at golf courses or cemeteries, to improve overall basin understanding.*

*F4. Utilize the groundwater model to simulate the collective impacts of current, near-term, and long-term projected groundwater production*

*F5. If current or future production is considered beyond the basin yield and is anticipated to result in not meeting the Groundwater Level BMO, voluntarily apportionment of pumping to each agency may be performed to provide certainty on future levels of production. The apportionment will be determined by the water agencies at that time, but should consider historical production, access to*

*alternate sources, status of existing infrastructure, water quality considerations, and projected needs.*

### 5.3.2 REPLENISHMENT OF GROUNDWATER EXTRACTED BY WATER PRODUCERS

Groundwater replenishment may take place to cost effectively increase stored water in the aquifer for normal and drought periods or to support regional water supply goals. As long as the South Westside Basin remains in a hydrologically balanced condition, replenishment will occur on a voluntary basis, as economically feasible projects and water sources become available.

**Actions**

*Study the feasibility of and potential for implementing the following replenishment activities:*

*G1. Direct recharge of storm water and other surface water, selecting replenishment water to best manage the quality of recharge waters and receiving waters*

*G2. Substitution of other water supplies such as recycled water or imported water for groundwater*

*G3. Conservation efforts*

*G4. Study the suitability of near surface conditions for improved recharge from low impact development techniques such as permeable pavement, swales, and others. Study should include subsurface materials and perched groundwater conditions.*

*G5. Should the basin become overdrafted for extended periods of time, appropriate actions for replenishment should be taken with proper governance structures.*

### 5.3.3 FACILITATION OF CONJUNCTIVE USE OPERATIONS

Conjunctive use operations can assist groundwater basin management as the agencies have access to both groundwater and surface water supplies. Conjunctive use in the South Westside Basin in the form of large-scale direct recharge through spreading basins may not be cost-effective due to high land costs and clay layers in the upper aquifer system, but potential options should be studied if identified. Conjunctive use could more likely take the form of in-lieu recharge, in which other supply sources, such as imports or recycled water, may replace groundwater, thus offsetting future groundwater pumping during times of reduced imported water supplies. Injection of water into the aquifer may also be considered. Consideration should be given to water quality changes that may occur due to recharge activities and the increase in groundwater levels, particularly with the potential mobilization of nitrate in the subsurface.

**Actions**

*H1. Consider the development, implementation, and maintenance of programs and projects to recharge aquifers. Programs may be local or regional in scope. These may use imported water, recycled*

*water, and other waters to offset existing and future groundwater pumping, except in the following situations:*

- *Groundwater quality would be reduced, unless lower water quality provides maximum benefit*
- *Available groundwater aquifers are full*
- *Rising water tables threaten the stability of existing structures*

*H2. Support regional groundwater banking operations that are beneficial to the South Westside Basin and the region and support the goals of this GWMP.*

## 5.4 GROUNDWATER QUALITY

### 5.4.1 CONTROL OF SEAWATER INTRUSION

The threat of seawater intrusion in the South Westside Basin includes the potential migration of seawater from the Pacific Ocean and San Francisco Bay. Control of this migration includes monitoring groundwater levels, groundwater quality, and groundwater production. Should monitoring indicate increased risk of seawater intrusion, actions should be evaluated that would raise groundwater levels through increased recharge or decreased extraction.

**Actions**

*I1. Continue monitoring for seawater intrusion at the margins of the basin. Study the need for additional monitoring locations or inclusion of additional indicators or triggers.*

*I2. Combine seawater intrusion monitoring results with monitoring of basin-wide groundwater levels, groundwater quality, and production to fully determine risk of seawater intrusion.*

*I3. Evaluate the reduction of the gradient between sea level and groundwater levels through increased recharge or decreased production in the affected area.*

### 5.4.2 IDENTIFICATION AND MANAGEMENT OF WELLHEAD PROTECTION AREAS AND RECHARGE AREAS

The entire South Westside Basin is a source of recharge and requires protection to ensure high quality recharge and to maintain or enhance existing recharge quantities. Pervious areas such as open spaces and the numerous parks, cemeteries, and golf courses allow water to percolate into the soil and recharge the aquifer. No significant land use changes are anticipated in the built-out South Westside Basin, and these pervious areas are unlikely to be paved or otherwise developed. However, if such actions are considered in the future, the impact to the groundwater basin should be studied. Additionally, opportunities to increase pervious areas should be explored.

Drinking water source assessments produced by the groundwater agencies have identified uses that threaten groundwater quality in the South Westside Basin along with delineation of capture zones around wells. Uses that threaten some wells in the basin include:

- Automobile repair shops
- Automobile gas stations
- Dry cleaners
- Military installations
- Sewer collection systems
- Underground storage tanks - confirmed leaking tanks
- Utility stations - maintenance areas

**Actions**

*J1. Preserve and protect, to the extent possible, aquifer recharge areas.*

*J2. Implement public outreach efforts.*

*J3. Design recharge facilities to minimize pollutant discharge into storm drainage systems, natural drainage, and aquifers.*

*J4. Decrease storm water runoff, where feasible, by reducing paving in development areas, and by using design practices such as permeable parking bays and porous parking lots with beamed storage areas for rainwater detention. Exercise caution to avoid contamination from oil, gas, and other surface chemicals.*

*J5. Manage streams with natural approaches, to the maximum extent possible, where groundwater recharge is likely to occur.*

*J6. Identify prime recharge areas and consider offering incentives to landowners in exchange for limiting their ability to develop their property due to its retention as a natural groundwater recharge area. These incentives will encourage the preservation of natural water courses without creating undue hardship on the property owners, and might include density transfer functions.*

*J7. Submit the map of recharge areas (Figure 2.10) to local planning agencies and notify DWR and other interested persons when the map is submitted to those local planning agencies, as required by AB359 (Huffman)*

### 5.4.3 REGULATION OF THE MIGRATION OF CONTAMINATED GROUNDWATER

It is important to regulate contaminated groundwater migration both for protecting existing sources of groundwater and for developing new sources of groundwater. Coordination with regulatory agencies and potentially responsible parties will give water managers input into the cleanup and containment of contaminated sites and will improve long-term planning efforts based on the predicted impact of those hazards. Additionally, new, improved, and more cost-

effective treatment technologies can potentially result in additional potable or non-potable supplies from groundwater that was previously considered unavailable for use.

**Action**

*K1. Coordinate with local regulatory agencies to share information about contaminated sites and about the South Westside Basin groundwater system and wells. Treatment systems will be investigated as new non-potable supply sources.*

*K2. Coordinate with the SWRCB to verify the classification of contaminated media at sites within the basin in their GeoTracker website.*

### 5.4.4 ADMINISTRATION OF A WELL ABANDONMENT AND WELL DESTRUCTION PROGRAM

Abandoned or poorly constructed wells should be properly destroyed to prevent migration of contaminants down well bores from the surface to the aquifer or across clay layers within the aquifer. Well destruction in the basin is administered by San Mateo County's Groundwater Protection Program (GPP). Destruction of wells is performed in accordance with the procedures set forth in DWR's *California Well Standards,* Bulletin 74-90 (1990).

**Actions**

*L1. Survey abandoned wells in the South Westside Basin both physically and from county records.*

*L2. Coordinate with San Mateo County's Groundwater Protection Program on destruction standards and procedures, as well as on logging of status of abandoned and destroyed wells.*

*L3. Encourage and, if feasible, provide funding for the destruction of abandoned wells.*

### 5.4.5 IDENTIFICATION OF WELL CONSTRUCTION POLICIES

Well construction in the South Westside Basin also is administered by San Mateo County's Groundwater Protection Program.

San Mateo County's Groundwater Protection Program issues permits for the construction or abandonment of all water wells including, but not limited to driven wells, monitoring wells, cathodic wells, extraction wells, agricultural wells, and community water supply wells. The wells are inspected during different stages of construction to verify standards are met. All drinking water wells are evaluated once installation is complete to ensure compliance with California Well Standards set forth in DWR's *California Well Standards,* Bulletin 74-90 (1990) and minimum drinking water standards.

**Actions**

*M1. Coordinate with San Mateo County's Groundwater Protection Program staff to ensure all parties are aware of local and regional contamination plumes. Increased caution or restrictions may be necessary near these plumes.*

## 5.5 CONSTRUCTION AND OPERATION BY THE LOCAL AGENCY OF GROUNDWATER CONTAMINATION CLEANUP, RECHARGE, STORAGE, CONSERVATION, WATER RECYCLING, AND EXTRACTION PROJECTS

Properly designed, constructed, and operated projects can cost-effectively move the South Westside Basin towards meeting water quantity, water quality, and subsidence objectives.

These projects could include:

- Groundwater contamination cleanup

**Actions**

*N1. Remediate basin groundwater from point-source (e.g., TCE, fuels) and non-point-source (e.g., nitrate) contamination, in a cost-effective manner. Point-source cleanup activities will include interfacing with regulatory agencies, potentially responsible parties, and other nearby agencies and municipalities. These actions will seek to return the contaminated area, to the extent possible, to a water supply source. Cleanup activities will be performed by the potentially responsible parties, and the regulatory agencies. Payment for impacts to the water system, if any, will be sought from the potentially responsible parties.*

- Recharge

**Actions**

*N2. Evaluate and consider the construction and operation of projects to recharge good-quality surplus water to the groundwater basin. Recharge water may include storm water, surface water, recycled water, or imported water and will be captured through existing pumping facilities. Recharge water would be selected to mutually benefit groundwater quantity and quality. It is not anticipated that additional facilities will be needed to extract stored water. Facilities are anticipated to be small in scale, rather than large spreading basins that are not cost-effective in the urbanized South Westside Basin.*

- Storage – Additional surface storage, while beneficial, is not anticipated in the area beyond small scale water harvesting and detention basins.
- Conservation – Conservation is a key part of water demand management in the South Westside Basin, exhibited by already low per-capita water use. CalWater and Millbrae are signatories to the MOU of the California Urban Water Conservation Council and participate in demand-side management measures. These agencies have committed to implementing best management practices to reduce water demand.

**Actions**

*N3. Agencies should work to build upon already successful conservation efforts by considering signing the MOU and participating in the California Urban Water Conservation Council, or implementing equivalent local efforts.*

*N4. Encourage installation of water-conserving systems such as dry wells and gray water systems where feasible, especially in new construction. Also encourage installation of rain gardens, cisterns, or infiltrators to capture rainwater from roofs for irrigation in the dry season and flood control during heavy storms.*

*N5. Support outreach programs to promote water conservation and widespread use of water saving technologies.*

*N6. Encourage continued outdoor irrigation water conservation.*

- Water recycling – Recycled water is available from Daly City's tertiary treatment plant. Other treatment plants could potentially provide recycled water in the future.

**Actions**

*N7. Evaluate and consider the expansion of existing recycled water programs, including efforts to utilize effluent from other treatment plants in the basin. Significant opportunities are available for usage of tertiary recycled water at the cemeteries, if appropriate funding mechanisms can be developed.*

- Extraction – Continued groundwater extraction will likely be necessary to meet future demand.

**Actions**

*N8. Perform groundwater modeling during the planning stages to ensure there are no significant impacts from new wells.*

## 5.6 COORDINATED PLANNING

### 5.6.1 DEVELOPMENT OF RELATIONSHIPS WITH STATE AND FEDERAL REGULATORY AGENCIES

Federal and state regulatory agencies to develop of relationships with include the following:

- Federal
  - EPA – contaminated sites
  - USGS – aquifer and watershed conditions, groundwater and surface water monitoring
- State
  - DPH – drinking water quality and vulnerability
  - DTSC – contaminated sites
  - DWR – aquifer conditions

- RWQCB – surface water quality and groundwater quality, permitting
- Water Board – groundwater monitoring (GAMA)

**Actions**

*O1. Coordinate with these federal and state agencies on issues related to monitoring and contaminated sites as well as on opportunities for grant funding.*

### 5.6.2 COORDINATION WITH IRWMP EFFORTS

As noted in Section 1, Introduction and Background, the Plan Area is part of the Bay Area IRWMP. Coordination during implementation of the GWMP with these IRWMP efforts is important to ensure that local efforts help meet regional goals and vice-versa.

**Action**

*P1. Ensure that at least one member of the Groundwater Task Force is actively involved in the coordination of both the IRWMP and the GWMP. This member will provide dialogue between the two efforts.*

### 5.6.3 REVIEW OF LAND USE PLANS AND COORDINATION WITH LAND USE PLANNING AGENCIES TO ASSESS ACTIVITIES THAT CREATE A REASONABLE RISK OF GROUNDWATER CONTAMINATION

As discussed in Section 5.4.2, Identification and Management of Wellhead Protection Areas and Recharge Areas, certain land uses and activities can potentially impact groundwater quality. Avoiding these uses in recharge areas and near wells is a better strategy than mitigation once the land uses are already in place.

**Actions**

*Q1. Coordinate between stakeholders and land use planning agencies to encourage protection of the groundwater resource by limiting activities that create an unreasonable risk to groundwater. Maps of well locations with soil properties will be provided to assist land use planning agencies in their decision process.*

*Q2. Monitor environmental impact reports and comment on such reports to ensure the water resources are protected.*

*Q3. Involve water agencies through water supply assessments as required under SB 610. The water supply assessment documents water supply sufficiency by identifying sources of water supply, quantifying water demands, evaluating drought impacts, and providing a comparison of water supply and demand.*

## 5.7 REPORTING AND UPDATING

Reporting on the status of the GWMP implementation is important for the fulfillment of the actions and projects listed in the plan. Updating the plan is important to reflect changing conditions and understanding of the basin.

**Actions**

*R1. Report on the GWMP's implementation progress every 2 years; include details on monitoring activities, trigger status of BMOs, project implementation, and new or unresolved issues. Post reports and status tables or maps for BMOs on the Internet.*

*R2. Update the GWMP every 5 years, unless changes in conditions in the basin warrant updates on a different frequency. Updates will be limited to those sections that require updating. Notify the public of the update and develop the update with input from the public and the Groundwater Task Force.*

# 6 IMPLEMENTATION

## 6.1 GOVERNANCE

The current governance of the South Westside Basin is based on the individual interest model. Under the individual interest model, stakeholders govern and develop water resource projects individually. The individual interest model will be retained with representatives from each stakeholder eligible for participation in the Groundwater Task Force. Individual development of projects will be designed and implemented following the common goal, objectives, and elements described in this GWMP, and will be presented to the Task Force for informational and coordination purposes. Additionally, coordination between stakeholders will allow for easier implementation of projects spanning multiple jurisdictions or benefitting multiple jurisdictions. As a potential next step, the governance structure may be defined in a MOU, which may be developed and signed after the adoption of this GWMP. The primary feature of the governance of the South Westside Basin would be the South Westside Basin Groundwater Task Force (Groundwater Task Force), which would lead the implementation of this GWMP.

### 6.1.1 ROLES AND RESPONSIBILITIES

The Groundwater Task Force will

- Guide the implementation of the GWMP
    - Discuss and advance regional and local groundwater projects such as
        - Conjunctive use
        - Stormwater capture
        - Alternate supplies, such as recycled water
    - Coordinate on monitoring and CASGEM compliance
    - Coordinate on groundwater modeling and data management
    - Coordinate with larger regional efforts such as the Bay Area IRWMP
    - Coordinate on grant and loan opportunities
    - Develop reporting for GWMP implementation
- Share hydrogeological and operational information with others, such as
    - Groundwater levels
    - Groundwater quality
    - Well performance
- Provide a forum for public interaction on groundwater issues
- Provide a basis for future governance, if needed

### 6.1.2 MEMBERSHIP AND PARTICIPATION

Membership in the Groundwater Task Force is anticipated to include representatives from San Bruno, Daly City, California Water Service Company, and SFPUC as well as other major stakeholders, as follows in alphabetical order:

- Agricultural representative
- BAWSCA
- California Water Service Company
- Cemetery representative
- Town of Colma
- City of Daly City
- Environmental representative
- Golf Course representative
- Public representative
- Representative for cities not using groundwater (Millbrae and Burlingame)
- City of San Bruno
- San Francisco Public Utilities Commission
- San Mateo County

Changes to the composition of the Groundwater Task Force may be made with unanimous consent of the signatories to the potential MOU and a majority of all members attending the meeting.

Other entities are also encouraged to attend the meetings, including City of South San Francisco, RWQCB, United Airlines, and other interested groups or individuals. Participation by these groups in the meetings should be encouraged to allow for transfer of knowledge and a unified implementation of groundwater management.

### 6.1.3 ADMINISTRATION

A Groundwater Task Force administrator is needed to provide leadership to maintain progress and meet the implementation goals of the GWMP. The potential MOU may establish the initial administrator and a procedure to change the administrator from time-to-time. The administrator must have adopted this GWMP. Responsibilities of the administrator include:

- Scheduling regular meetings
- Providing agendas and minutes
- Monitoring or directing the monitoring of progress towards meeting implementation goals
- Developing or directing the development of annual reports
- Updating the GWMP as necessary

### 6.1.4 MEETINGS

Groundwater Task Force meetings would provide a forum for representatives from stakeholder groups to discuss and resolve regional groundwater issues. The meetings would be at least twice a year and open to the public.

The meetings would be intended to allow for the sharing of information as well as for the development of programs or projects needed to implement the GWMP. Information sharing may include changes to water supply infrastructure, new monitoring data, or new problems or opportunities. New programs and projects may be developed and implemented by individual stakeholders, by groups of stakeholders, or by all stakeholders. The ultimate project-making authority remains within the entity sponsoring the project.

### 6.1.5 VOTING

The representatives on the Groundwater Task Force would coordinate on matters relevant to groundwater management in the South Westside Basin, using the goal, objectives, and elements of this GWMP to guide their decisions. Some occasions may require a formal vote by the Groundwater Task Force, specifically for the following:

- Changing of the composition of the Groundwater Task Force
- Changes to the MOU

Decisions to change the composition of the group would require unanimous support among the signatories to the potential MOU and would require majority support among all members attending the meeting to move forward. Decisions of the group to change the MOU must be unanimous among the MOU signatories to move forward. Projects may move forward with the support of a subset of the group, but would do so outside of the auspices of the Groundwater Task Force.

### 6.1.6 POTENTIAL FUTURE GOVERNANCE

If deemed necessary by the Groundwater Task Force, a MOU may be signed to create a more formalized governance structure. It is not anticipated at this time that future needs would require a more structured management system through a JPA.

Advantages to the individual interest approach in this Plan and through the potential MOU include the following:

- Agencies can focus their resources on projects specific to their needs
- No loss of management control by local groundwater resources
- Ease of implementation because it is a continuation of the current approach to groundwater management in the region.

Moving to a mutual interest model based on a JPA could provide the following:

- Ease pursuing regional projects that would benefit the entire South Westside Basin
- Define who coordinates projects and what role each agency plays during regional project planning, construction, operation, and maintenance
- Generate economies of scale for large projects
- Increase likelihood of state funding for projects benefiting multiple entities
- Prevent individual stakeholders from undertaking actions not complementary to the BMOs.
- Improved framework for resolution of conflicts.

Any potential future need to develop a MOU or JPA would be discussed through the Groundwater Task Force.

## 6.2 DISPUTE RESOLUTION

Disputes relating to implementation of the GWMP will be resolved by the Groundwater Task Force. In the event that the Groundwater Task Force cannot resolve the dispute, an outside neutral third party will assist the parties in working towards a satisfactory resolution, with completion of all procedures within 60 to 90 days, unless the parties to the dispute agree to a longer timeframe. Costs incurred, if any, in this process will be equally shared by the involved parties.

## 6.3 FINANCING AND BUDGET

Financing of projects will be on a project-by-project basis and will be the responsibility of the sponsoring agency or group, unless other agreements are made. Financing for the reporting and updating of the GWMP will be shared among the GWMP participants, with details to be mutually agreed upon.

It is anticipated that SFPUC will, at their discretion, continue providing for the development of annual reports for the entire South Westside Basin, with support from the GWMP participants for data and review. Additional items not currently included in SFPUC's annual reports but required by this GWMP may require a funding agreement from the water agencies adopting and agreeing to this GWMP.

## 6.4 SCHEDULE

The following schedule highlights the key milestones for implementation of the Groundwater Management Plan.

| *Item* | *Reference Section* | *Initial Completion* | *Recurrence* |
|---|---|---|---|
| *Meet with stakeholders to define and consider adoption of a governance structure* | *6.1* | *2 years* | *n/a* |
| *Implement basinwide semiannual static groundwater level monitoring* | *4.3.1, 5.2.1, App. C* | *1 year* | *n/a* |
| *Add additional pressure transducers to existing groundwater level monitoring network* | *5.2.1 App. C* | *2 year* | *n/a* |
| *Implement a voluntary groundwater level monitoring program for private groundwater producers* | *App. C* | *2 years* | *n/a* |
| *Develop program to survey and destroy abandoned wells* | *5.4.4* | *3 years* | *n/a* |
| *Implement a voluntary groundwater production monitoring program for private groundwater producers* | *App. C* | *3 years* | *n/a* |
| *Identify recharge strategies to increase yield* | *2.3.5, 5.3.1 5.3.2 5.3.3 5.4.1 5.4.2 5.5 5.6.3* | *2 years* | *As needed* |
| *Update Groundwater Model* | *4.3.1* | *1 years* | *1 year* |
| *Complete subsidence analysis using InSAR* | *4.3.4* | *5 years* | *As needed* |
| *Continue public outreach and education* | *5.1* | *2 years* | *Ongoing* |
| *Report on GWMP* | *5.7* | *2 years* | *1 year* |
| *Update GWMP* | *5.7* | *5 year* | *5 years* |

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# APPENDIX G:
# SFPUC REGIONAL WATER SYSTEM SUPPLY RELIABILITY AND BAWSCA TIER 2 DROUGHT IMPLEMENTATION SCENARIOS

San Francisco
Water Power Sewer
Operator of the Hetch Hetchy Regional Water System

525 Golden Gate Avenue, 10th Floor
San Francisco, CA 94102
T 415.554.3271
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January 5, 2016

Andree Johnson
Water Resources Specialist
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 650
San Mateo, CA 94402

Dear Ms. Johnson,

Attached please find the information you requested on the Regional Water System's supply reliability for use in the Wholesale Customer's 2015 Urban Water Management Plan (UWMP) updates. The SFPUC has assessed the water supply reliability under the following planning scenarios:

- Projected single dry year supply for base year 2015[1],
- Projected multiple dry year supply beginning with base year 2015, and
- Projected supply reliability for base year 2015 through 2040.

Table 1 summarizes deliveries to the Wholesale Customers for projected single dry year supply for base year 2015 and projected multiple dry year supply beginning base year 2015.

With regards to future demands, the SFPUC proposes to expand their water supply portfolio by increasing the types of water supply resources. Table 2 summarizes the water supply resources assumed to be available by 2040, as well as other assumptions affecting supply. These assumptions differ from those used in the reliability analysis for the previous 2010 UWMP update, and lead to slightly different reliability projections explained further below.

Concerning allocation of supply during dry years, the Water Shortage Allocation Plan (WSAP) was utilized to allocate shortages between the SFPUC and the Wholesale Customers collectively. The WSAP implements a method for allocating water between the SFPUC retail customers and wholesale customers collectively which has been adopted by the Wholesale Customers

[1] Fiscal Year 2015 is used as the base year to run the water supply reliability analysis in the Hetch Hetchy Local Simulation Model (HHLSM). This base year reflects a wholesale Supply Assurance of 184 million gallons per day, as well as Regional Water System reservoir and pipeline capacities and instream flow requirements as they exist in 2015 (pre-Water System Improvement Program [WSIP] completion).

Edwin M. Lee
Mayor

Ann Moller Caen
President

Francesca Vietor
Vice President

Vince Courtney
Commissioner

Anson Moran
Commissioner

Ike Kwon
Commissioner

Harlan L. Kelly, Jr.
General Manager

per the July 2009 Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County, and Santa Clara County. The wholesale customers have adopted the Tier Two Plan, the second component of the WSAP, which allocates the collective wholesale customer share among each of the 26 wholesale customers.

Finally, the SFPUC estimated the frequency and severity of anticipated shortages for the period 2015 (base year) through 2040. For this analysis, we assumed that the historical hydrologic period is indicative of future events and evaluated the supply reliability assuming a repeat of the actual historic hydrologic period 1921 through 2011. The results of this analysis are summarized in Table 3.

Compared to the reliability projections that were provided previously for the 2010 UWMP update, Table 1 indicates slightly higher shortages and lower Wholesale allocations for dry years 2 and 3. Also, Table 3 shows slightly higher estimates of required rationing in multi-year droughts as compared to those provided previously. These differences are due to the inclusion of a temporary constraint on Crystal Springs Reservoir storage and an in-stream flow requirement below Crystal Springs Reservoir, which are shown in Table 2, but were not included in the previous reliability analysis.

It is our understanding that you will pass this information on to the Wholesale Customers. If you have any questions or need additional information, please do not hesitate to contact me at (415) 554-0792.

Sincerely,

Paula Kehoe

Paula Kehoe
Director of Water Resources

**Table 1: Projected Deliveries for Three Multiple Dry Years**

| | Base Year 2015 (Non-Dry) | One Critical Dry Year | Deliveries During Multiple Dry Years | | |
|---|---|---|---|---|---|
| | | | Year 1 | Year 2 | Year 3 |
| System-Wide Shortage | 0% | 10% | 10% | 22% | 22% |
| Wholesale Allocation (MGD) | 184.0 | 152.6 | 152.6 | 129.2 | 129.2 |

MGD = million gallons per day

**Table 2: Water Supply Modeling Assumptions for Fiscal Years 2015 through 2040**

| | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 |
|---|---|---|---|---|---|---|
| **Water Supply Resource** | | | | | | |
| Westside Basin Groundwater (AF/yr) | | 8,100 | 8,100 | 8,100 | 8,100 | 8,100 |
| Districts Transfer (AF/yr) | | 2,240 | 2,240 | 2,240 | 2,240 | 2,240 |
| Crystal Springs Reservoir Capacity (20.3 BG) [1] | | | x | x | x | x |
| Calaveras Reservoir at Full Capacity | | x | x | x | x | x |
| Alameda Creek Recapture (9.3 MGD) | | x | x | x | x | x |
| **Reservoir Operation Affecting Supply** | | | | | | |
| Crystal Springs Reservoir Release for In-Stream Flow to San Mateo Creek (3.5 MGD) [2] | x | x | x | x | x | x |
| Calaveras Reservoir Release and Alameda Creek Diversion Dam Bypass for In-Stream Flow to Alameda Creek (9.3 MGD) | | x | x | x | x | x |

AF/yr = acre-feet per year, BG = billion gallons, MGD = million gallons per day, x = in operation

Notes:

1. Schedule for restoration of Crystal Springs Reservoir storage is tied to permitting requirements for endangered plants.
2. Release from Crystal Springs Reservoir to meet minimum in-stream flow requirement in San Mateo Creek began in January 2015.

**Table 3: Projected System Supply Reliability Based on Hydrologic Period**

| | Wholesale Demand (MGD) | | | | | |
|---|---|---|---|---|---|---|
| | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| | Projected Wholesale Allocation (MGD) | | | | | |
| **Fiscal Year** | **2015** | **2020** | **2025** | **2030** | **2035** | **2040** |
| 1920-21 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1921-22 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1922-23 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1923-24 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1924-25 | 152.6 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1925-26 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1926-27 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1927-28 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1928-29 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1929-30 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1930-31 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1931-32 | 129.2 | 152.6 | 152.6 | 152.6 | 152.6 | 152.6 |
| 1932-33 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1933-34 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1934-35 | 152.9 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1935-36 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1936-37 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1937-38 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1938-39 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1939-40 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1940-41 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1941-42 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1942-43 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1943-44 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1944-45 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1945-46 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1946-47 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1947-48 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1948-49 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1949-50 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1950-51 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1951-52 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1952-53 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1953-54 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1954-55 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1955-56 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1956-57 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1957-58 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1958-59 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1959-60 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1960-61 | 152.6 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |

| | Wholesale Demand (MGD) | | | | | |
|---|---|---|---|---|---|---|
| | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| | Projected Wholesale Allocation (MGD) | | | | | |
| **Fiscal Year** | **2015** | **2020** | **2025** | **2030** | **2035** | **2040** |
| 1961-62 | 129.2 | 152.6 | 152.6 | 152.6 | 152.6 | 152.6 |
| 1962-63 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1963-64 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1964-65 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1965-66 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1966-67 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1967-68 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1968-69 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1969-70 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1970-71 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1971-72 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1972-73 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1973-74 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1974-75 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1975-76 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1976-77 | 152.6 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1977-78 | 129.2 | 152.6 | 152.6 | 152.6 | 152.6 | 152.6 |
| 1978-79 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1979-80 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1980-81 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1981-82 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1982-83 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1983-84 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1984-85 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1985-86 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1986-87 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1987-88 | 152.6 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1988-89 | 129.2 | 152.6 | 152.6 | 152.6 | 152.6 | 152.6 |
| 1989-90 | 129.2 | 152.6 | 152.6 | 152.6 | 152.6 | 152.6 |
| 1990-91 | 129.2 | 132.5 | 132.5 | 132.5 | 132.5 | 132.5 |
| 1991-92 | 129.2 | 132.5 | 132.5 | 132.5 | 132.5 | 132.5 |
| 1992-93 | 129.2 | 132.5 | 132.5 | 132.5 | 132.5 | 132.5 |
| 1993-94 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1994-95 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1995-96 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1996-97 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1997-98 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1998-99 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1999-00 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 2000-01 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 2001-02 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 2002-03 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 2003-04 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |

| | Wholesale Demand (MGD) | | | | | |
|---|---|---|---|---|---|---|
| | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| | Projected Wholesale Allocation (MGD) | | | | | |
| **Fiscal Year** | **2015** | **2020** | **2025** | **2030** | **2035** | **2040** |
| 2004-05 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 2005-06 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 2006-07 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 2007-08 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 2008-09 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 2009-10 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 2010-11 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |

MGD = million gallons per day

# 2015 UWMP Tier 2 Allocation Scenarios

| Agency | Base Year (FY 12-13) SFPUC Purchases | Scenarios for Total Available Supply to Wholesale Customers | |
|---|---|---|---|
| | | 129.2 MGD | 132.5.MGD |
| ACWD | 8.96 | 8.06 | 8.51 |
| Brisbane/GVMID | 0.59 | 0.53 | 0.56 |
| Burlingame | 4.00 | 3.78 | 3.70 |
| Coastside | 1.82 | 1.65 | 1.62 |
| CWS Total | 31.18 | 27.81 | 27.11 |
| Daly City | 4.01 | 3.29 | 3.39 |
| East Palo Alto | 2.07 | 1.95 | 1.97 |
| Estero | 4.10 | 3.69 | 3.92 |
| Hayward | 15.48 | 13.93 | 14.71 |
| Hillsborough | 3.30 | 3.02 | 2.91 |
| Menlo Park | 3.25 | 2.92 | 3.04 |
| Mid Pen WD | 2.98 | 2.81 | 2.75 |
| Millbrae | 2.28 | 2.05 | 2.15 |
| Milpitas | 6.38 | 5.75 | 6.06 |
| Mountain View | 9.00 | 8.10 | 8.55 |
| North Coast | 2.44 | 2.20 | 2.32 |
| Palo Alto | 11.33 | 10.20 | 10.76 |
| Purissima Hills | 1.99 | 1.37 | 1.51 |
| Redwood City | 9.73 | 8.63 | 8.45 |
| San Bruno | 1.94 | 1.75 | 1.84 |
| San José | 4.45 | 3.05 | 3.38 |
| Santa Clara | 2.29 | 1.57 | 1.74 |
| Stanford | 2.15 | 1.93 | 2.00 |
| Sunnyvale | 9.28 | 8.35 | 8.67 |
| Westborough | 0.90 | 0.81 | 0.86 |
| Wholesale Total | **145.90** | **129.20** | **132.50** |

*6-Jan-16*

# APPENDIX H:
# WATER QUALITY REPORTS

# BURLINGAME

## 2014 Water Quality Report

This report contains important information about your drinking water. Translate it, or speak with someone who understands it.

Este informe contiene información muy importante sobre su agua potable. Tradúzcalo o hable con alguien que lo entienda bien.

此份水質報告，內有重要資訊。請找他人為你翻譯和解說清楚。

### OUR DRINKING WATER SOURCES AND TREATMENT

The sources of drinking water (both tap and bottled water) include rivers, lakes, oceans, streams, ponds, reservoirs, springs, and wells.

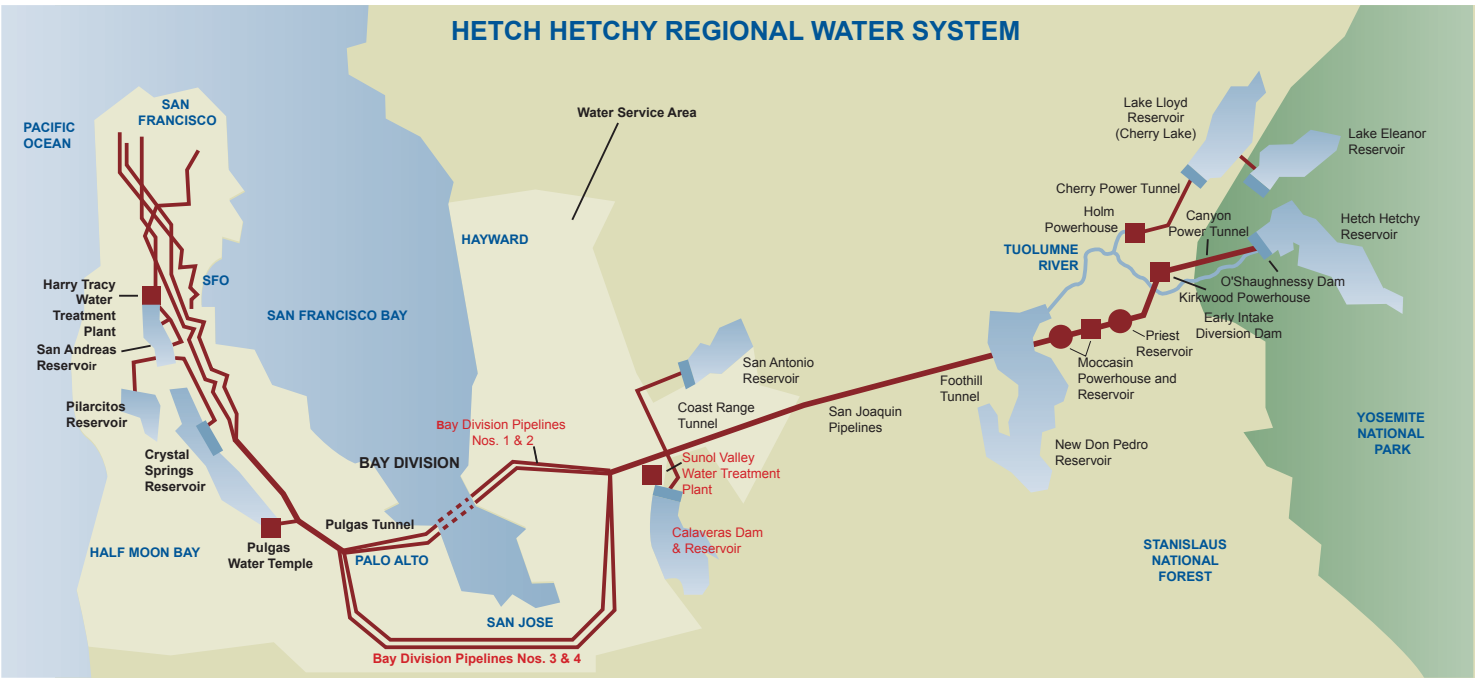
The drinking water delivered by the Burlingame Water Division is supplied by the San Francisco Regional Water System (SFRWS), our major water source originates from spring snowmelt flowing down the Tuolumne River to storage in Hetch Hetchy Reservoir. The pristine, well protected Sierra water source is exempt from filtration requirements by the United States Environmental Protection Agency (USEPA) and State Water Resources Control Board's Division of Drinking Water (SWRCB). Water treatments provided by the SFRWS, including disinfection by ultraviolet light and chlorine, corrosion control by adjustment of the water pH value, fluoridation for dental health protection, and chloramination for maintaining disinfectant residual and minimizing disinfection byproduct formation, are in place to meet the drinking water regulatory requirements.

The Hetch Hetchy water is supplemented with surface water from two local watersheds. Rainfall and runoff from the 35,000-acre Alameda Watershed in Alameda and Santa Clara counties are collected in the Calaveras and San Antonio reservoirs for filtration and disinfection at the Sunol Valley Water Treatment Plant. Rainfall and runoff from the 23,000-acre Peninsula Watershed in San Mateo County are stored in the Crystal Springs, San Andreas, and Pilarcitos reservoirs, and are filtered and disinfected at the Harry Tracy Water Treatment Plant.

As in the past, the Hetch Hetchy Watershed provided the majority of our total water supply, with the remainder contributed by the two local watersheds in 2014.

### OUR MISSION: Quality Water

The City of Burlingame in coordination with the San Francisco Public Utilities Commission (SFPUC) is pleased to present our 2014 Annual Water Quality Consumer Confidence Report. We want our customers to know where their water comes from, how it is treated to ensure it is top quality and the results of water quality monitoring performed by the City of Burlingame and the SFPUC. With this knowledge, consumers can make health decisions concerning their water use. The SFPUC supplied an average of 205 million gallons per day (MGD) of water via its Regional Water System to serve 2.6 million people in the Bay Area in 2014. The City of Burlingame and the SFPUC are committed to customer service and providing you with high quality water.



# BURLINGAME WATER SYSTEM SERVICE AREA

The City of Burlingame purchases all of its water from the San Francisco Public Utilities Commission (SFPUC). The San Francisco Regional Water System (SFRWS) has several large pipelines running through town. We have six metered connections at various locations throughout the city. These connections feed directly into the Aqueduct zone (Purple area on map). Water is pumped to the higher elevations by booster pump stations and to storage reservoirs. To regulate the pressure in the higher elevations we have several pressure reducing valves.

# WATER QUALITY

The SFPUC's Water Quality Division (WQD) regularly collects and tests water samples from reservoirs and designated sampling points throughout the system to ensure the water delivered to you meets or exceeds federal and state drinking water standards. In 2014, WQD staff conducted more than 52,000 drinking water tests in the transmission and distribution systems. This is in addition to the extensive treatment process control monitoring performed by the SFPUC's certified operators and online instruments.

As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animals or from human activity. Such substances are called contaminants.

Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that water poses a health risk. In order to ensure that tap water is safe to drink, the USEPA and SWRCB prescribe regulations that limit the amount of certain contaminants in water provided by public water systems. SWRCB regulations also establish limits for contaminants in bottled water that provide the same protection for public health..

# CONTAMINANTS AND REGULATIONS

### CONTAMINANTS THAT MAY BE PRESENT IN SOURCE WATER INCLUDE:

- Microbial contaminants, such as viruses and bacteria, that may come from sewage treatment plants, septic systems, agricultural livestock operations, and wildlife.
- Inorganic contaminants, such as salts and metals, that can be naturally occurring or result from urban stormwater runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming. Pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses.
- Pesticides and herbicides that may come from a variety of sources such as agriculture, urban stormwater runoff, and residential uses
- Organic chemical contaminants, including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban stormwater runoff, agricultural application, and septic systems.
- Radioactive contaminants, which can be naturally occurring or be the result of oil and gas production, and mining activities.

More information about contaminants and potential health effects can be obtained by calling the USEPA's Safe Drinking Water Hotline **800-426-4791**.

## Key Water Quality Terms

Following are definitions of key terms referring to standards and goals of water quality noted on the adjacent data table.

**PUBLIC HEALTH GOAL (PHG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. PHGs are set by the California Environmental Protection Agency.

**MAXIMUM CONTAMINANT LEVEL GOAL (MCLG):** The level of a contaminant in drinking water below which there is no known or expected risk to health. MCLGs are set by the USEPA.

**MAXIMUM CONTAMINANT LEVEL (MCL):** The highest level of a contaminant that is allowed in drinking water. Primary MCLs are set as close to the PHGs or MCLGs as is economically and technologically feasible. Secondary MCLs (SMCLs) are set to protect the odor, taste, and appearance of drinking water.

**MAXIMUM RESIDUAL DISINFECTANT LEVEL (MRDL):** The highest level of a disinfectant allowed in drinking water. There is convincing evidence that addition of a disinfectant is necessary for control of microbial contaminants.

**MAXIMUM RESIDUAL DISINFECTANT LEVEL GOAL (MRDLG):** The level of a drinking water disinfectant below which there is no known or expected risk to health. MRDLGs do not reflect the benefits of the use of disinfectants to control microbial contaminants.

**PRIMARY DRINKING WATER STANDARD (PDWS):** MCLs and MRDLs for contaminants that affect health along with their monitoring and reporting requirements, and water treatment requirements.

**REGULATORY ACTION LEVEL:** The concentration of a contaminant which, if exceeded, triggers treatment or other requirements that a water system must follow.

**TREATMENT TECHNIQUE (TT):** A required process intended to reduce the level of a contaminant in drinking water.

**TURBIDITY:** A water clarity indicator that measures cloudiness of the water, and is also used to indicate the effectiveness of the filtration system. High turbidity can hinder the effectiveness of disinfectants.

# SPECIAL HEALTH NEEDS

Some people may be more vulnerable to contaminants in drinking water than the general population. Immuno-compromised persons, such as those with cancer undergoing chemotherapy, persons who have undergone organ transplants, people with HIV/AIDS or other immune system disorders, some elderly people, and infants, can be particularly at risk from infections. These people should seek advice about drinking water from their health care providers. USEPA/ Centers for Disease Control guidelines on appropriate means to lessen the risk of infection by Cryptosporidium and other microbial contaminants are available from the USEPA's Safe Drinking Water Hotline **800-426-4791** or at **www.epa.gov/safewater**.

## CITY OF BURLINGAME - WATER QUALITY DATA FOR YEAR 2014

The table below lists all 2014 detected drinking water contaminants and the information about their typical sources. Contaminants below detection limits for reporting are not shown, in accordance with regulatory guidance. The SFRWS received from the SWRCB a monitoring waiver for some contaminants such that their monitoring frequencies are less than annual.

| DETECTED CONTAMINANTS | Unit | MCL | PHG or (MCLG) | Range or Level Found | Average or [Max] | Major Sources in Drinking Water |
|---|---|---|---|---|---|---|
| **TURBIDITY** | | | | | | |
| Unfiltered Hetch Hetchy Water | NTU | 5 | N/A | 0.2 - 0.6 (1) | [2.8] | Soil runoff |
| Filtered Water from Sunol Valley Water Treatment Plant (SVWTP) | NTU<br>- | 1(2)<br>min 95% of samples ≤0.3 NTU(2) | N/A<br>N/A | -<br>97-100% | [0.98]<br>- | Soil runoff<br>Soil runoff |
| Filtered Water from Harry Tracy Water Treatment Plant (HTWTP) | NTU<br>- | 1(2)<br>min 95% of samples ≤0.3 NTU(2) | N/A<br>N/A | -<br>100% | [0.07]<br>- | Soil runoff<br>Soil runoff |
| **DISINFECTION BYPRODUCTS AND PRECURSOR** | | | | | | |
| Total Trihalomethanes | ppb | 80 | N/A | 18-53 | [51.7] (3) | Byproduct of drinking water disinfection |
| Haloacetic Acids | ppb | 60 | N/A | 5.5 - 39 | [36.8] (3) | Byproduct of drinking water disinfection |
| Total Organic Carbon (4) | ppm | TT | N/A | 1.3-2.8 | 1.9 | Various natural and man-made sources |
| **MICROBIOLOGICAL (City of Burlingame)** | | | | | | |
| Total Coliform | - | NoP ≤ 5.0% of monthly samples | [0] | 0 - 9.1% (11) | [9.1%] | Naturally present in the environment |
| Giardia lamblia | cyst/L | TT | [0] | <0.01 - 0.04 | <0.01 | Naturally present in the environment |
| **INORGANICS** | | | | | | |
| Fluoride (source water) (5) | ppm | 2.0 | 1 | ND - 0.8 | 0.4 (6) | Erosion of natural deposits; water additive to promote strong teeth |
| Chloramine (as chlorine ) | ppm | MRDL = 4.0 | MRDLG = 4 | 0.1-3.2 | [2.25](7) | Drinking water disinfectant added for treatment |
| **CONSTITUENTS WITH SECONDARY STANDARDS** | **Unit** | **SMCL** | **PHG** | **Range** | **Average** | **Typical Sources in Drinking Water** |
| Chloride | ppm | 500 | N/A | <3 - 15 | 9 | Runoff / leaching from natural deposits |
| Odor Threshold | TON | 3 | N/A | ND-1 | ND | Naturally-occurring organic materials |
| Specific Conductance | µS/cm | 1600 | N/A | 32-222 | 151 | Substances that form ions when in water |
| Sulfate | ppm | 500 | N/A | 0.9-32 | 17 | Substances that form ions when in water |
| Total Dissolved Solids | ppm | 1000 | N/A | 31-120 | 81 | Runoff / leaching from natural deposits |
| Turbidity | NTU | 5 | N/A | 0.1 - 0.2 | 0.1 | Soil runoff |
| **LEAD AND COPPER** | **Unit** | **AL** | **PHG** | **Range** | **90th Percetile** | **Major Sources in Drinking Water** |
| Copper | ppb | 1300 | 300 | 5.2 - 110.8(8) | 51.7 | Internal corrosion of household water plumbing systems |
| Lead | ppb | 15 | 0.2 | <1 - 7.1 (8) | 2.6 | Internal corrosion of household water plumbing systems |

| OTHER WATER QUALITY PARAMETERS | Unit | ORL | Range | Average |
|---|---|---|---|---|
| Alkalinity (as CaCO3) | ppm | N/A | 8 - 94 | 37 |
| Bromide (9) | ppb | N/A | ND-27 | 5 |
| Calcium (as Ca) | ppm | N/A | 3 - 20 | 11 |
| Chlorate (10) | ppb | (800) NL | 34 - 740 | 314 |
| Hardness (as CaCO3) | ppm | N/A | 7 - 77 | 46 |
| Magnesium | ppm | N/A | <0.2 - 6.4 | 3.9 |
| pH | - | N/A | 6.9 - 10.2 | 9.3 |
| Potassium | ppm | N/A | 0.2 - 1 | 0.6 |
| Silica | ppm | N/A | 2 - 5 | 4 |
| Sodium | ppm | N/A | 2.4 - 16 | 10 |

**KEY:**

| | | |
|---|---|---|
| < / ≤ | = | less than / less than or equal to |
| AL | = | Action Level |
| Max | = | Maximum |
| Min | = | Minimum |
| N/A | = | Not Available |
| ND | = | Non-detect |
| NL | = | Notification Level |
| NoP | = | Number of Coliform-Positive Sample |
| NTU | = | Nephelometric Turbidity Unit |
| ORL | = | Other Regulatory Level |
| pCi/L | = | picocurie per liter |
| ppb | = | part per billion |
| ppm | = | part per million |
| TON | = | Threshold Odor Number |
| TT | = | Treatment Technique |
| µS/cm | = | microSiemens / centimeter |

Note:
(1) These are monthly averaged turbidity values measured every 4 hours daily.
(2) There is no turbidity MCL for filtered water. The limits are based on the TT requirements for filtration systems.
(3) This is the highest locational running annual average value.
(4) Total organic carbon is a precursor for disinfection byproduct formation. The TT requirement applies to the filtered water from the SVWTP only.
(5) The SWRCB specifies the fluoride levels in the treated water be maintained within a range of 0.8 ppm - 1.5 ppm. In 2014, the range and average of the fluoride levels were 0.6 ppm - 1.2 ppm and 0.9 ppm, respectively.
(6) The natural fluoride level in the Hetch Hetchy supply was ND. Elevated fluoride levels in the SVWTP and HTWTP raw water are attributed to the transfer of fluoridated Hetch Hetchy water into the reservoirs.
(7) This is the highest running annual average value
(8) The most recent Lead and Copper Rule monitoring was in 2013. 0 of 30 site samples collected at consumer taps had lead or copper concentrations above the AL.
(9) Bromide was detected in HTWTP effluent only.
(10) The detected chlorate in the treated water is a degradation product of sodium hypochlorite used by the SFPUC for water disinfection.
(11) The City of Burlingame exceeded the MCL Level for Total Coliform in the months of May and July of 2014.

**Note: Additional water quality data may be obtained by calling the City of Burlingame Water Division at (650) 558-7670**

# PROTECTING OUR WATERSHEDS

The SFPUC's annual Hetch Hetchy Watershed Sanitary Survey evaluates the sanitary conditions, water quality, potential contamination sources, and the results of watershed management activities with partner agencies including the National Park Service and US Forest Service.

The SFPUC also conducts sanitary surveys every five years to detect and track sanitary concerns for the local watersheds and the approved standby water sources in Early Intake Watershed, which includes Cherry Lake and Lake Eleanor. The latest 5-year surveys were completed in 2011 for the period of 2006-2010. These surveys identified wildlife, stock, and human activities as potential contamination sources. The reports are available for review at the San Francisco District office of SWRCB (510) 620-3474.

*Hetch Hetchy Reservoir from O'Shaughnessy Dam*

# WHAT YOU SHOULD KNOW ABOUT DRINKING WATER SAFETY

## REDUCING LEAD FROM PLUMBING FIXTURES

Lead in drinking water is primarily from materials and components associated with service lines and home plumbing. There are no known lead service lines in the Burlingame Water distribution system. We are responsible for providing high quality drinking water, but cannot control the variety of materials used in plumbing components. It is possible that lead levels at your home may be higher than at others because of plumbing materials used in your property.

If present, elevated levels of lead can cause serious health problems, especially for pregnant women and young children. Infants and young children are typically more vulnerable to lead in drinking water than the general population. When your water has been sitting for several hours, you can minimize the potential for lead exposure by flushing your tap for 30 seconds to 2 minutes before using water for drinking or cooking. If you are concerned about lead levels in your water, you may wish to have your water tested. Additional information on lead in drinking water, testing methods, and steps you can take to minimize exposure is available from the USEPA's Safe Drinking Water Hotline **800-426-4791**, or at **www.epa.gov/safewater/lead.**

## UNREGULATED CONTAMINANT MONITORING RULE (UCMR3)

The Burlingame Water Division conducted monitoring as required by the USEPA's third Unregulated Contaminant Monitoring Rule (UCMR3) in 2013. The monitoring results were included in the 2013 Annual Water Quality Report, which is accessible at **www.Burlingame.org/drinkingwater**.

## CRYPTOSPORIDIUM

Cryptosporidium is a parasitic microbe found in most surface water. The SFPUC regularly tests for this waterborne pathogen, and found it at very low levels in source water and treated water in 2014. However, current test methods approved by the USEPA do not distinguish between dead organisms and those capable of causing disease. Ingestion of Cryptosporidium may produce symptoms of nausea, abdominal cramps, diarrhea, and associated headaches. Cryptosporidium must be ingested to cause disease, and it may be spread through means other than drinking water.

## FLUORIDATION AND DENTAL FLUOROSIS

Mandated by State law, water fluoridation is a widely accepted practice proven to be safe and effective for preventing and controlling tooth decay. Our water has been fluoridated at 0.9 milligram per liter until May 2015, when the new State regulatory guidance was issued. The water is now fluoridated at a new optimal level of 0.7 mg/L. Infants fed formula mixed with water containing fluoride at this level may have an increased chance of developing tiny white lines or streaks in their teeth. These marks are referred to as mild to very mild fluorosis, and are often only visible under a microscope. Even in cases where the marks are visible, they do not pose any health risk. CDC considers it safe to use optimally fluoridated water for preparing infant formula. To lessen this chance of dental fluorosis, you may choose to use low-fluoride bottled water to prepare infant formula. Nevertheless, children may still develop dental fluorosis due to fluoride intake from other sources such as food, toothpaste and dental products. Contact your health provider or SWRCB if you have concerns about dental fluorosis. For additional information visit the SWRCB website (**www.swrcb.ca.gov/)** and search for fluoride, or the CDC website **(www.cdc.gov/fluoridation)**.

## WATER CONSERVATION OPPORTUNITIES

The City Council declared a 'water shortage condition' on May 18, 2015 to formally implement water conservation restrictions to meet the State mandate. For more information on City restrictions and resources available to residential and commercial customers, go to **www.Burlingame.org/drought**. For questions or concerns, call Burlingame's Water Conservation Hotline at **(650) 558-761**2 or email **waterconservation@burlingame.org**.

## WATER IS PRECIOUS — PLEASE USE IT WISELY!

A few easy lifestyle shifts that save water to address drought conditions:

- Turn off the faucet when you are brushing your teeth or doing dishes
- Wash fruits/vegetables in a bowl of water instead of running a tap; then use the leftover water for your plants.
- Compost vegetable food waste instead of using the garbage disposal.
- Time your shower to keep it under 5 minutes.
- Use a broom to clean sidewalks or driveways.
- Operate your washing machine and dishwasher with full loads.
- Irrigate sparingly and only during early morning and evening hours.

## WATER MAIN FLUSHING PROGRAM

The Burlingame Public Works Water division routinely flushes water mains throughout the City in order to maintain water quality and remove sediment that may be present. Tuberculation (a form of corrosion inside iron pipes) and sediment can discolor water, and over time, impede the flow of water through the distribution system. The mains are flushed through a systematic opening and closing of valves to force the flow of water in one direction. This technique, known as unidirectional flushing, allows section by section of pipeline to be cleaned, which reduces the amount of water required to effectively clean the pipeline distribution system.

The Public Works Department is very aware of current drought conditions and is doing everything possible to reduce flushing throughout the City; however, there will be occasions that the Water Division will need to perform flushing. The Division is committed to doing everything possible to investigate secondary uses for the discharged water. For more information about water pipeline flushing or water conservation, call Burlingame's Water Conservation Hotline at (650) 558-7612 or email **waterconservation@burlingame.org**.

City of Burlingame
501 Primrose Road
Burlingame, CA 94010

# WATER QUALITY REPORT 2014

## FOR MORE INFORMATION

If you would like additional information or if you have any questions concerning the City of Burlingame's testing data or water distribution system, please call the Public Works Department at (650) 558-7670, or write to Public Works Corporation Yard, Attn: Water Quality Report, 1361 N. Carolan, Burlingame, CA 94010. You may also wish to visit **www.burlingame.org/.**

Decisions about our drinking water are made from time to time in public meetings. The City of Burlingame City Council meets twice a month on the first and third Monday at 7:00 p.m. in the Council Chambers at City Hall. The San Francisco Public Utilities Commission (SFPUC) meets twice a month on the second and fourth Tuesday at 1:30 p.m. Meetings are held at San Francisco City Hall, Room 400. Inquiries about these meetings can be made by calling the office of the Commission Secretary at (415) 554-3165 or visit their website at **www.sfwater.org .**

Do you want to learn more about drinking water regulations? Visit the California State Water Resources Control Board at **www.dhs.ca.gov**, or the U.S. Environmental Protection Agency website at **www.epa.gov**.

**City of Burlingame**

Public Works Department ..... (650) 558-7670
Website ..... www.burlingame.org

**San Francisco Public Utilities Commission**

Water Quality Bureau ..... (650) 872-5950
Customer Service Bureau ..... (415) 551-3000
Website ..... www.sfwater.org

**State Water Resources Control Board**

District 17 - Santa Clara/San Mateo ..... (510) 620-3474
Home Treatment Device Certification Unit ..... (916) 327-1140
Website ..... www.SWRCB.ca.gov

Safe Drinking Water Hotline ..... (800) 426-4791
Website ..... www.epa.gov

# APPENDIX I:
# CHAPTER 15.06 OF THE CITY OF BURLINGAME MUNICIPAL CODE (WATER SHORTAGE EMERGENCIES) AND WATER RATIONING PLAN RESOLUTION 49-92 (WRPR)

## Chapter 15.06 WATER SHORTAGE EMERGENCIES

### 15.06.010 Implementation of chapter.

(a) The provisions of this chapter shall be implemented only upon adoption by the city council of a declaration that a water shortage condition exists that requires special conservation measures or emergency allocation measures pursuant to California Water Code Section 350 et seq.

(b) The provisions of the chapter shall be of no further force or effect when the city council determines that a water shortage condition no longer exists. (Ord. 1101 § 1, (1977); Ord. 1365 § 1, (1988))

### 15.06.020 Definitions.

For the purposes of this chapter, the following terms, phrases, words and their derivations shall have the meaning given in this chapter:

(a) “Customer” is any person using water supplied by the Burlingame water department.

(b) “Director” is the director of public works of the city of Burlingame.

(c) “Emergency allocations” are the allocations allowed various classifications of customers to achieve a specific reduction in water use necessitated by a water shortage of emergency proportions.

(d) “Person” is any person, firm, partnership, corporation, company or organization of any kind.

(e) “Special conservation measures” are the measures required to achieve a specific reduction in water use necessitated by a water shortage which has not reached emergency proportions.

(f) “Unit of water” is one thousand (1,000) gallons of water.

(g) “Water” is water from the water department.

(h) “Water department” is the Burlingame municipal water system.

(i) “Water shortage” means a water shortage condition declared by the city council pursuant to Sections 350 et seq., of the Water Code. (Ord. 1101 § 1, (1977); Ord. 1365 § 1, (1988))

### 15.06.030 Allocations.

When the city council declares a water shortage that requires emergency allocations, it shall specify in the declaration the specific allocations required to achieve the specified reduction in water use. The allocations may include any or all of the following classifications:

(a) Single-party residential and multifamily residential customers, including a minimum or lifeline allocation;

(b) Nonresidential customers:

(1) Industrial customers using process water to manufacture, alter, convert, clean, heat or cool a product, including water used in laundries and recycled car wash facilities,

(2) Industrial, commercial (including nonrecycled car wash facilities) and governmental agency customers;

(c) Irrigation and Outside Water Usage Customers. Irrigation of lawns, gardens, playfields, parks, median strips and landscaping of any type. (Ord. 1101 § 1, (1977); Ord. 1365 § 1, (1988))

### 15.06.040 Regulations and restrictions.

The city council at the time it declares a water shortage may adopt water use regulations and restrictions, including, but not limited to, any or all of the following:

(a) Broken or defective plumbing, sprinklers, watering or irrigation systems which permit the escape or leakage of water shall be immediately repaired.

(b) Irrigation of lawns, gardens, playfields, parks, median strips and landscaping of any type shall be reduced by an amount determined by the city council to be necessary to achieve the goals set forth in its declaration of a water shortage.

(c) No use of water shall be allowed which results in flooding or runoff in gutters, driveways or streets.

(d) When a hose is used for washing cars, buses, boats, trailers or other vehicles, or washing building structures or parts thereof, or any similar purpose, it shall have a positive shutoff valve.

(e) Use of a hose for the purposes set forth in subsection (d) of this section shall be prohibited.

(f) Restaurants shall serve water to customers only upon request.

(g) No water shall be used to clean, fill or maintain levels in decorative exterior fountains; interior fountains must recirculate water.

(h) Sidewalks, walkways, driveways, patios, parking lots, tennis courts or other hard-surfaced areas shall not be cleaned using water from hoses or by other use of water directly from faucets or other outlets.

(i) Draining and filling of any existing or new swimming pools with city-supplied water shall be prohibited.

(j) Service connections for new construction incorporating water-saving devices shall be granted as long as conditions of this chapter are met, provided no residential landscaping shall be installed during the water shortage.

(k) Construction water for consolidation of backfill and other nondomestic uses shall be denied if other methods of water sources can be used.

(l) No new residential irrigation services shall be permitted, and additional water shall not be allowed for expansion of existing irrigation facilities. (Ord. 1101 § 1, (1977); Ord. 1365 § 1, (1988))

## 15.06.050 Exceptions.

Considerations for exceptions regarding allocations of water or from any of the regulations and restrictions set forth herein shall be as follows:

(a) Written applications for exceptions shall be made to the City of Burlingame Water Department, 501 Primrose Road, Burlingame, California 94010.

(b) Each application shall be reviewed and determined by the director. Denials of applications may be appealed to the city council whose decision shall be final.

(c) The only grounds for granting such exceptions are:

(1) Undue hardship to the applicant, including adverse economic impacts such as loss of production or jobs;

(2) A condition affecting the health, sanitation or safety of the applicant or the general public.

Prior to granting an exception, the director must be satisfied that all practical water conservation measures have been adopted by the applicant. (Ord. 1101 § 1, (1977); Ord. 1365 § 1, (1988))

## 15.06.060 Penalties for excess water consumption.

The following penalties may be imposed on excess water consumption:

(a) Excess Use Charge. The city council shall set by resolution an amount to be added to the normal cost per unit for each unit in excess of allocation.

(b) Flow-Restricting Devices. The city manager may, after one written warning, direct the installation of a flow-restricting device on the service line of any customer observed by city personnel to be violating any of the regulations and/or exceeding water allocations hereinabove set forth.

Charges for installation and removal of flow-restricting devices shall be set by council.

First installation shall be a minimum of three (3) days, second and last installation, ten (10) days minimum.

(c) Discontinuance of Water Service. Continued water consumption in excess of the allocation may result in the discontinuance of water service by the water department. A reactivation charge shall be paid prior to reactivating the service.

(d) Fines and Penalties as Provided in Title 1 of this Code. Persons violating the provisions set forth in this chapter may also be subject to the fines and penalties set forth in Title 1 of this code. (Ord. 1101 § 1, (1977); Ord. 1365 § 1, (1988); Ord. 1921 § 1, (2015))

## 15.06.070 Enforcement.

The director, all employees of the water department, public works department and fire department have the duty and are authorized to enforce the provisions of this chapter and shall have all the powers and authority contained in California Penal Code Section 836.5, including the power to issue written notices to appear.

In addition to the foregoing, the city attorney, code compliance officer and their designees are authorized to enforce the provisions of this chapter through the mechanisms provided in Title 1 of this code. (Ord. 1101 § 1, (1977); Ord. 1365 § 1, (1988); Ord. 1921 § 1, (2015))

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View the mobile version.

EXHIBIT A

WATER RATIONING PLAN

RESOLUTION NO. 49-92

I. ALLOCATIONS

A. Allocations of water during the water shortage emergency will be a per capita allocation for residential accounts and a percentage reduction of 1987 usage for commercial accounts and multifamily dwellings.

Single Family and Duplex

| | |
|---|---|
| First Person | 100 gallons/day |
| 2nd-4th Persons | 70 gallons/day for each person |
| 5 or more persons | 50 gallons/day for each person |

Landscape Allocation

| Lot Size | Extra Allocation |
|---|---|
| Less than 10,000 Sq.Ft. | 50 gallons/day |
| 10,000+ sq. ft. | 150 gallons/day |
| 3/4 Acre + | up to 300 gal./day* |

*If water conservation measures implemented

| | Jun 1 - Nov 30 | Dec 1 - May 31 |
|---|---|---|
| Multi-Family | 15% Reduction | 7% Reduction |
| Food Related | 20% " | 10% " |
| Commercial, Industry & Hotels w/food | 25% " | 15% " |
| Irrigation/Parks | 50% " | 50% " |
| Government, schools, hospitals, churches | 25% " | 25% " |

B. Allocations for new accounts will be based on the number of occupants of residential units and by considering similar use data for commercial/industrial accounts.

C. A change in use will be reason to adjust the existing allocation.

D. Limited banking is permitted. Accounts with existing unused allocation may retain up to 10,000 gallons from the 1990-91 rationing program. Beginning with meter readings on or after June 1, 1991, an additional 10,000 gallons may be banked, up to a maximum bank of 20,000 gallons.

E. Residents who have not previously notified the City regarding the number of residents in the dwelling unit will receive an allocation for one person until the information is received. All landscape allocations will be established at less than 10,000 square feet lot size for City residents and 10,000+ square feet for Burlingame Hills (unincorporated) area.

## II. WATER USE REGULATIONS AND RESTRICTIONS

A. Water waste, flooding or runoff into the street or gutters is prohibited.

B. Hoses cannot be used to clean hard surface areas (sidewalks, driveways, roofs, awnings, etc.)

C. Hoses used for any purpose must have positive shutoff valves.

D. Restaurants or hotel banquets can serve water only upon request.

E. Potable water cannot be used to clean, fill or maintain levels in decorative fountains. The use of groundwater is permitted.

F. Additional water allocations will not be allowed for new landscaping or expansion of existing landscaping. Low water use landscaping designs and irrigation systems must be employed for new or renovated landscaping.

G. Water service connections for new construction will only be granted if water-saving fixtures or devices are incorporated into the plumbing system.

H. Use of potable water for consolidation of backfill, dust control or other non-essential construction purposes is prohibited. The use of groundwater and/or reclaimed water is permitted when approved by the Department of Health.

I. Verified water waste as determined by the City will serve as prima facie evidence that the allocation assigned to the water account is excessive. The allocation will then be subject to review and possible reduction, including termination of service.

J. Water used for all cooling purposes must be recycled.

K. The use of groundwater and/or reclaimed water is strongly encouraged when approved by the Department of Health for the following uses:
   1. Irrigation of turf areas.
   2. Irrigation of median strips.
   3. Street or parking lot sweepers/washers.

L. Use of reduced water flow equipment for the washing of fleet or dealer vehicles is strongly encouraged. Positive shutoff valves must be used.

M. Broken or defective plumbing, sprinklers, or irrigation systems which permit the escape or leakage of water must be immediately repaired.

## III. WATER USE IN EXCESS OF ALLOCATION

A. Penalties.

1) Excess water consumption is all billing units over allocation.

2) Charges for excess water use shall be two times the regular unit charge for each unit in excess of allocation up to 110% of allocation. The charge for excess water use shall be three times the regular unit charge for each unit over 110% of allocation up to 130% of allocation. The charge for excess water use shall be five times the regular unit charge for each unit over 130% of allocation.

3) No excess use charge shall be applied to any customer using less than 7,500 gallons per month.

B. Flow Restricting Devices.

The City Manager may, direct the installation of a flow-restricting device under the following conditions:

1) The customer has been mailed or personally served at least one written warning of being fifty percent (50%) or more over allocation for a billing period or has had at least two (2) written warnings of violations of the use restrictions.

2) The restricting device shall be removed only after a minimum 3-day period has elapsed and only upon payment of the appropriate installation and removal charges.

3) After one removal of a restricting device, if the customer is again fifty percent (50%) or more over allocation for a billing period or receives another violation notice of the use restrictions, the City may install a flow-restricting device which shall remain in place until this water rationing plan shall terminate and the appropriate charge for removal is paid.

4) No restrictor shall be placed on a customer using less than 7,500 gallons per month.

5) Restriction devices may be installed or water service discontinued if a customer fails to repair broken or defective plumbing within five (5) days after receipt of notice of the need for repairs.

C. Discontinuance of Water Service.

The City Manager may direct that water service be discontinued for repeated violations of water use restrictions under the following circumstances:

1) Notice of intention to terminate service shall be delivered by certified mail or personal service. It shall state that a hearing will be held before the City Manager and shall direct the customer to show cause why his service should not be terminated. The notice shall be served at least five (5) days before said hearing.

2) At the hearing the City Manager shall determine whether or not the customer's service shall be restricted, terminated or such other remedy as may be appropriate. His decision may be appealed to the City Council which may affirm, reverse or modify his decision.

D. Charges for installation and removal of flow-restricting devices are as follows:

| Meter Size | Installation Cost | Removal Cost |
|---|---|---|
| 5/8" to 1" | $ 50.00 | $25.00 |
| 1-1/2" to 2" | 100.00 | 50.00 |
| 3" and larger | Actual Cost | Actual Cost |

First installation to be a minimum of three days; second and last installation ten days minimum. Actual cost shall include all material, labor, equipment and overhead charges.

The charge for discontinuance of water services shall be twenty-five dollars ($25.00) and shall be paid prior to reactivating the service.

IV. EXCEPTIONS

A. When considering exceptions for allocations based on 1987 usage, the Director of Finance may use the Calendar Year 1986 if the water use records show that the customer clearly conserved water in 1987 compared to 1986.

B. If a customer does not have a 1987 record, then the amount of the allocation shall be established by considering similar uses and/or standard usage data for commercial usage, and a per capita standard shall be used for residential accounts.

C. For special circumstances, the Director of Finance may use comparable usage data from water records or publications.

V. IMPLEMENTATION

A. This plan shall become effective upon adoption by the City Council.

# APPENDIX J:
# DROUGHT RESPONSE TOOL USER GUIDE

# Drought Response Tool
# User's Guide

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# 1. INTRODUCTION

The Drought Response Tool (DRT) is an Excel spreadsheet model that has been developed to assist water suppliers with:

- Evaluating baseline water use by sector and by indoor/outdoor use;
- Identifying customer sectors (e.g., Residential; Commercial, Industrial and Institutional [CII]; and Dedicated Irrigation) and uses to target for water savings;
- Evaluating a menu of drought response actions and estimate their water savings potential; and
- Tracking progress against the water use reduction goal associated with a stage of action in the supplier's Water Shortage Contingency Plan.

The following sections guide the user through the model structure and the key input parameters, assumptions, and calculations that form the basis of the DRT.

*It should be noted that the DRT is only a predictive tool that generates a water savings potential based on an assumed set of water use and savings inputs by the user, including Drought Response Actions, savings estimates, and implementation rates. The DRT in no way guarantees water savings or other performance metrics.*

## 2. DROUGHT RESPONSE TOOL STRUCTURE AND OVERVIEW

- **Structure:** The DRT consists of six, linked Excel worksheets:

  (1) Home
  (2) Water Use Inputs
  (3) Water Use Profile
  (4) Drought Response Actions
  (5) Estimated Water Savings
  (6) Drought Response Tracking

  A detailed guide to each worksheet is provided in Section 3.

- **Navigation:** Users can navigate between worksheets using buttons at the top of each sheet or the tabs at the bottom of the Excel window.

- **Color Coding:** On each worksheet, the cells highlighted in white indicate locations where supplier inputs are required or the user can adjust default values. The model will automatically populate all charts and cells highlighted in light blue based on the input data and associated model calculations. Certain cells will be highlighted in gray to indicate that the value is overridden and will not factor into calculations (cells highlighted in gray are discussed in more detail in Section 3.4).

- **Default Values:** In some cases, the white cells are populated with default values. If a user modifies the default values, the revisions will be displayed as **bold font** so the user can clearly track where they have made modifications within the DRT.

- **Instructions and Tips:** Instructions and tips are provided in cells marked with the symbol ⓘ and also appear in "pop ups" when certain cells are selected.

- **Data Validation.** Throughout the DRT there are a series of data validation checks to provide support to the user.

- **Functionality:** The DRT is designed to run on systems with Microsoft Office 2007 or later versions. For full functionality of the model, the user must enable the use of macros.[1]

[1] To enable the use of macros, click the Microsoft Office Button at the top left hand corner and then click Excel Options. Choose Trust Center from the menu at the left and then Trust Center Settings at the right. Under Macro Settings, select "Enable all macros." Alternatively you can follow instructions from Microsoft Help.

# 3. DROUGHT RESPONSE TOOL WORKSHEETS

This section provides a brief summary of the key DRT inputs, outputs and assumptions.

## 3.1 Worksheet 1 – Home

Input the following agency-specific information, as shown in Figure 1:

- **Agency Name:** Type in the water supplier's name.
- **Total Population Served:** Population is assumed to be constant for the purpose of the DRT modeling.
- **Required Conservation Standard**: Enter the percentage water use reduction goal.
- **Number of Accounts by Sector:** The number of accounts for each sector (Residential, CII, and Dedicated Irrigation) is assumed to be constant for the purpose of the DRT modeling. If single-family and multi-family accounts are tracked separately, enter the combined number of accounts under Residential accounts. If CII accounts are tracked separately, enter the combined number of all CII accounts.
- **Baseline Year(s):** The Baseline Year defines the year that corresponds with potable water production and use data that will be

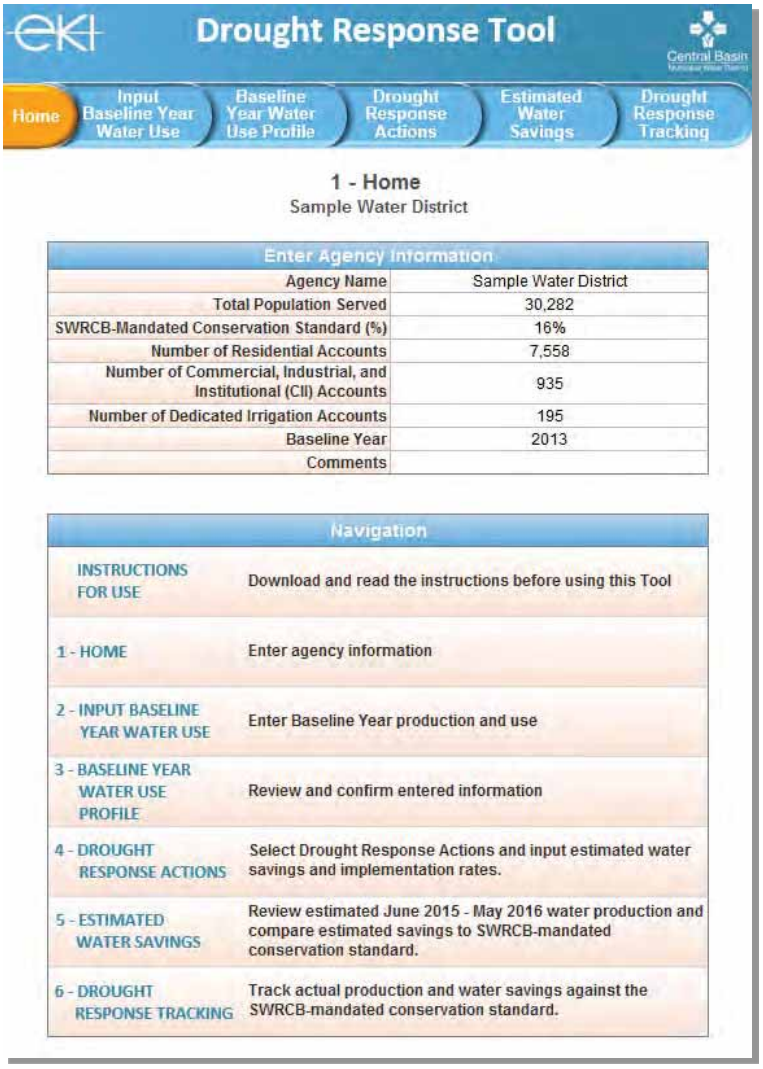


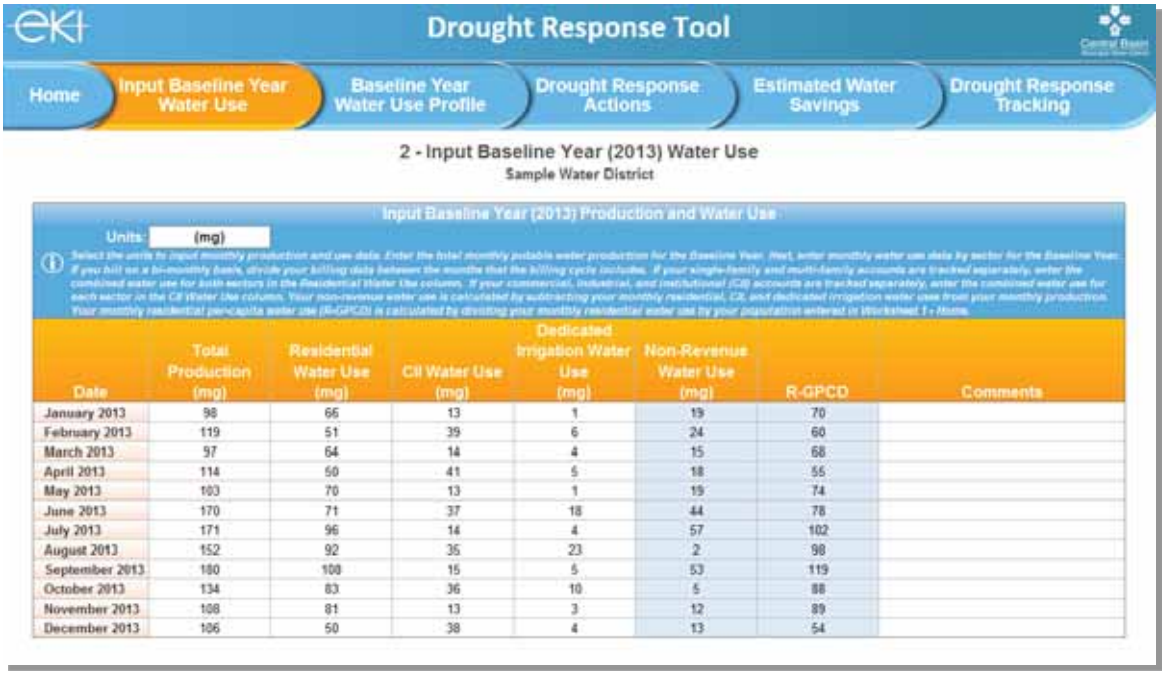

**Figure 1:** *Worksheet 1 – Home* of the DRT © 2015 Erler & Kalinowski, Inc.

entered in *Worksheet 2 – Water Use Inputs*. The user may enter in a single Baseline Year or an average of several historical years, if desired.

*Worksheet 1 – Home* also provides users an overview for navigating the DRT and provides a live link to the *Central Basin Drought Response Tool User's Guide*, which is hosted on the Erler & Kalinowski, Inc. website.

### 3.2 Worksheet 2 – Water Use Inputs

A shown in Figure 2, enter monthly potable water production and water use data for the Baseline Year (e.g., 2013), or the average over multiple historical years (e.g. 2011-2015). A drop down menu is provided in the table header to select the units for the input data (e.g., in million gallons, acre-feet, etc.). Baseline water use inputs include:




| Date | Total Production (mg) | Residential Water Use (mg) | CII Water Use (mg) | Dedicated Irrigation Water Use (mg) | Non-Revenue Water Use (mg) | R-GPCD | Comments |
|---|---|---|---|---|---|---|---|
| January 2013 | 98 | 66 | 13 | 1 | 19 | 70 | |
| February 2013 | 119 | 51 | 39 | 6 | 24 | 60 | |
| March 2013 | 97 | 64 | 14 | 4 | 15 | 68 | |
| April 2013 | 114 | 50 | 41 | 5 | 18 | 55 | |
| May 2013 | 103 | 70 | 13 | 1 | 19 | 74 | |
| June 2013 | 170 | 71 | 37 | 18 | 44 | 78 | |
| July 2013 | 171 | 96 | 14 | 4 | 57 | 102 | |
| August 2013 | 152 | 92 | 35 | 23 | 2 | 98 | |
| September 2013 | 180 | 108 | 15 | 5 | 53 | 119 | |
| October 2013 | 134 | 83 | 36 | 10 | 5 | 88 | |
| November 2013 | 108 | 81 | 13 | 3 | 12 | 89 | |
| December 2013 | 106 | 50 | 38 | 4 | 13 | 54 | |

**Figure 2:** *Worksheet 2 – Water Use Data* of the DRT © 2015 Erler & Kalinowski, Inc.

- **Monthly Production Data:** Enter the monthly potable water production for the Baseline Year, in the units selected in the table header.
- **Monthly Water Use Data by Sector:** Enter monthly water use by sector (Residential, CII, and Dedicated Irrigation) for the Baseline Year(s), in the units selected in the table header. Water use data will come from an agency's billing data for the Baseline Year(s). If water use data are collected on a bi-monthly basis, the water use data should be divided between the months that the billing cycle includes. If an agency's single-family and multi-family accounts are tracked separately, enter the combined water use in the Residential column. The same applies for the consolidation of water uses at CII and Dedicated Irrigation accounts, if applicable. If the total water use by

sector exceeds the amount entered for total production for a given month, the row will be highlighted in red.

- **Monthly Non-Revenue Water Use:** The DRT calculates non-revenue water use by subtracting the monthly Residential, CII, and Dedicated Irrigation water use volumes from the total monthly production.
- **R-GPCD:** The DRT calculates the monthly residential gallons per capita per day (R-GPCD) for the Baseline Year(s) by dividing the residential water use by the total population specified in Worksheet 1.

Inputs from Worksheets 1 and 2 are used in the remaining worksheets to estimate water savings potential.

### 3.3 Worksheet 3 – Water Use Profile

This worksheet provides high-level, graphical summaries of an agency's Baseline Year(s) water use by sector and by major end use (indoor versus outdoor). Users may select the units the data is displayed in from a drop down menu in the table header. By generally estimating how much of an agency's water use can be attributed to indoor use versus outdoor use and by sector, an agency can begin to identify areas and opportunities for water savings, see Figures 3 and 4. These data can also assist an agency is assessing where they can achieve water savings potential with minimal revenue impacts.

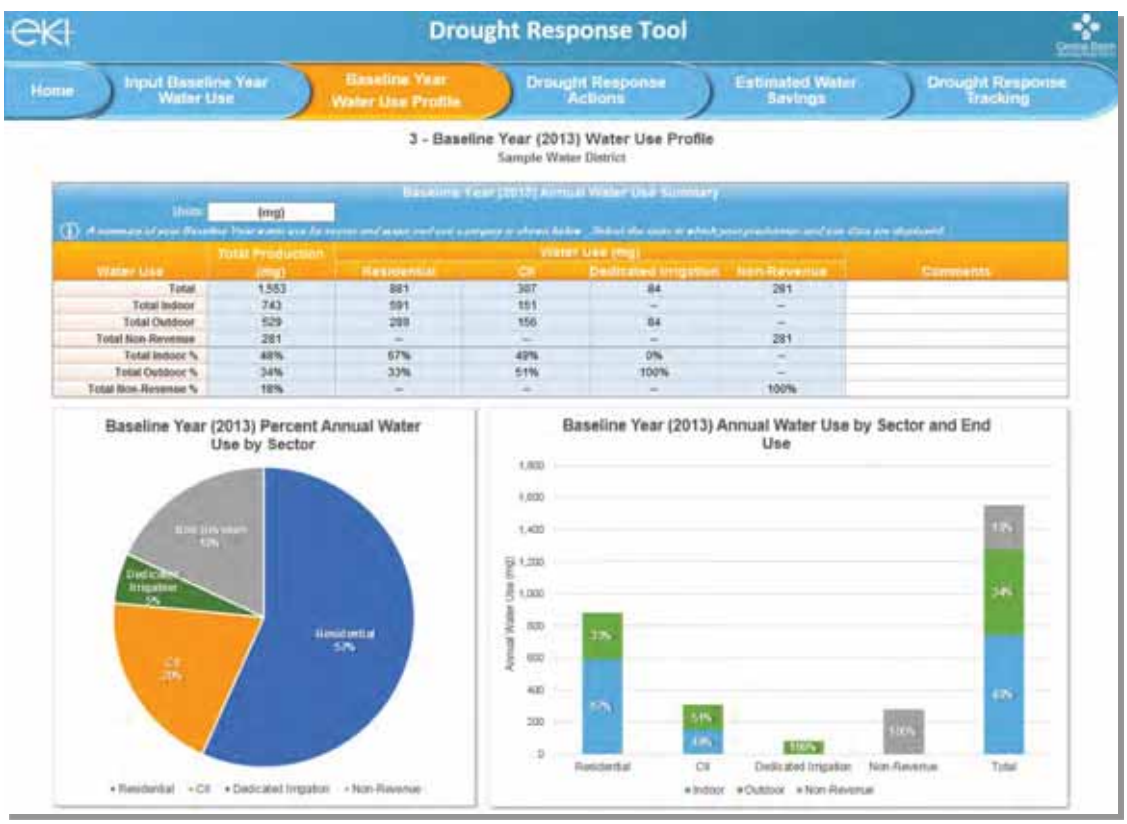



**Figure 3:** *Worksheet 3 – Water Use Profile* of the DRT © 2015 Erler & Kalinowski, Inc.

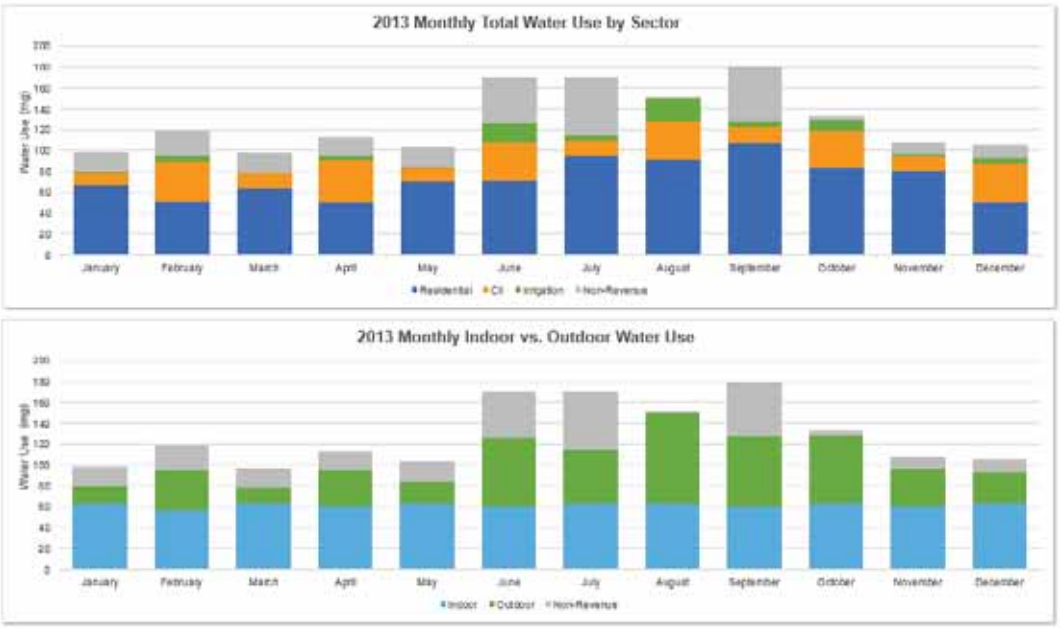



**Figure 4:** *Worksheet 3 – Water Use Profile* of the DRT © 2015 Erler & Kalinowski, Inc.

The following key assumptions were made in the DRT to support evaluation of supplier water use profiles:

(1) Monthly indoor use for each sector is assumed to be the amount of water used during the lowest water use month, normalized by the number of days in the month, based on the data entered by the user in *Worksheet 2 – Water Use Data*.

(2) Monthly outdoor use for each sector is calculated by subtracting the assumed monthly indoor water use [from (1)] from the total water use data entered by the user in *Worksheet 2 – Water Use Data.*

### 3.4 Worksheet 4 – Drought Response Actions

This worksheet provides a framework for estimating water savings associated with the implementation and enforcement of various Drought Response Actions. Key inputs include:

- **Maximum Savings Potential**: The DRT allows the agency to establish sector-specific "caps" on the water savings potential that the DRT will estimate. Specifically, these caps limit the potential savings estimated by the DRT based on certain agency-defined criteria. For example, to protect the economic vitality of a City, an agency may want to limit CII indoor reductions to 10%. Therefore, the water savings for indoor water use for the CII sector shown in *Worksheet 5 – Estimated Water Savings* will not exceed 10%, even if the water savings based on the selected indoor CII Drought Response Measures may exceed 10%.

The savings caps in the DRT include:

- Minimum allowable indoor residential use (R-GPCD);
- The maximum percent (%) reductions in residential outdoor use;
- The maximum % reduction in CII indoor use;
- The maximum % reduction in CII outdoor uses; and
- The maximum % reduction in dedicated irrigation use.

Based on the specified sector-specific caps, the DRT calculates the resulting % total maximum annual savings potential.

- **End Use Savings Potential**: Three pie chart graphs are shown towards the top of the worksheet that represent the assumed proportions of major end uses by sector based on published data (see Section 4 and Figure 5). These end use proportions are used in the DRT water savings calculations in two ways:
  - The end use proportions are used in combination with the End-Use Savings Estimates and Implementation Rates to estimate the Drought Response Action-specific water savings; and
  - The end use proportions serve as a "cap" on the potential water savings estimates because the DRT does not allow a Drought Response Action or suite of Actions to "save" more water than the targeted end use uses. For example, no matter how many Actions are implemented that target toilets, the DRT will not attribute a water savings greater than total amount of water assumed to be used by toilets.

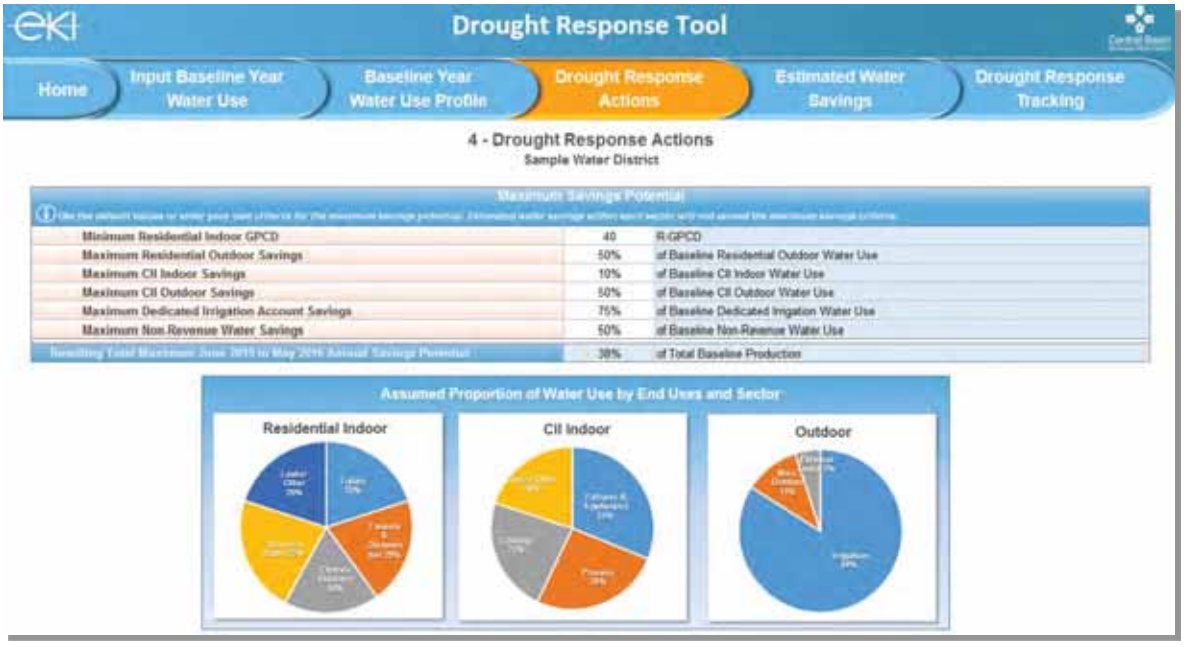



**Figure 5:** "Maximum Savings Potential" and "End Use Savings Potential" from *Worksheet 4 – Drought Response Actions* of the DRT © 2015 Erler & Kalinowski, Inc.

- **Potential Drought Response Actions**: A customized menu of potential Drought Response Actions or "Actions" is provided for agency consideration (see Figure 6). For each Action the Worksheet lists:
    - The associated end use(s) targeted by that Action;
    - The default estimated savings as a percentage of those end uses compared to baseline uses;
    - The default implementation rate (percentage of accounts that will take advantage of or comply with that Action); and
    - The basis of the default savings and implementation rates.

  Users can select the Drought Response Actions they wish to implement and include in the estimated savings calculations. The Drought Response Actions with cells highlighted in gray indicate that the action is overridden by another selected Action and will not factor into water savings calculations, even if selected.

**Drought Response Actions**

| Action Description | End Use(s) | Implement Program | End Use Savings (%) | Implementation Rate | Source of Default Savings Estimate | Source of Default Implementation Rate |
|---|---|---|---|---|---|---|
| ► Possible Mandatory Prohibitions | All Outdoor | ☑ | 14% | 50% | – | – |
| Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems | Irrigation | ☐ | | | – | – |
| Require Shut-Off Nozzles on Hoses for Vehicle Washing | Misc. Outdoor | ☐ | 17% | 50% | | – |
| Prohibit Use of Potable Water to Wash Sidewalks and Driveways | Misc. Outdoor | ☐ | 17% | 50% | See Appendix D of the DRP | – |
| Prohibit the Use of Potable Water for Street Washing | Misc. Outdoor | ☐ | 17% | 50% | | – |
| Prohibit Irrigation with Potable Water in a Manner that causes Runoff | Irrigation | ☐ | 7% | 50% | DeOreo et al., 2011 | – |
| Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall | Irrigation | ☐ | | | – | – |
| Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians | Irrigation | ☐ | | | – | – |
| Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water | Misc. Outdoor | ☐ | 50% | 50% | EBMUD, 2008 | – |
| Provide Linen Service Opt Out Options | Fixtures & Appliances | ☐ | 0.5% | 50% | EBMUD, 2011 | – |
| Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments | Fixtures & Appliances | ☐ | 0.5% | 50% | EBMUD, 2011 | – |

**Drought Response Actions**

| Action Description | End Use(s) | Implement Program | End Use Savings (%) | Implementation Rate | Source of Default Savings Estimate | Source of Default Implementation Rate |
|---|---|---|---|---|---|---|
| ► Agency Drought Actions / Restrictions | | | | | | |
| ► Agency Actions | | | | | | |
| Media Campaign, Newspaper Articles, Website | All | ☑ | 0.5% | 50% | EBMUD, 2011 | – |
| Promote Water Conservation / Rebate Programs | All | ☑ | | 50% | – | – |
| Water Efficiency Workshops, Public Events | All | ☑ | 0.5% | 25% | EBMUD, 2011 | – |
| Water Bill Inserts | All | ☑ | 0.5% | 100% | EBMUD, 2011 | – |
| Promote / Expand Use of Recycled Water | Irrigation | ☐ | 100% | | – | – |
| Home or Mobile Water Use Reports | All | ☐ | 5% | 10% | WaterSmart Software, 2015 | – |
| Decrease Frequency and Length of Line Flushing | Non Revenue Water | ☐ | 25% | 50% | See Appendix D of the DRP | Reduced flushing by 50% |
| Audit and Reduce System Water Loss | Non Revenue Water | ☐ | 45% | 50% | DWR, 2015 | Target 50% of leakage. |
| Implement Drought Rate Structure / Water Budgets | All | ☑ | 5% | 100% | CUWCC, 2015 | – |
| Establish Retrofit on Resale Ordinance | All Residential Indoor | ☐ | 21% | 6% | SFPUC, 2004 | First Tuesday, 2015 |
| Require Net Zero Demand Increase on New Connections | All | ☐ | | | – | – |
| Moratorium on New Connections | All | ☐ | | | – | – |
| Move to Monthly Metering / Billing | All | ☐ | 5% | 10% | See Appendix D of the DRP | – |
| Increase Water Waste Patrols / Enforcement | All | ☑ | | | – | – |
| Establish Drought Hotline | All | ☑ | | | – | – |
| Reduce Distribution System Pressures | Non Revenue Water | ☐ | 4.5% | 100% | CUWCC, 2010; DWR, 2015 | – |

**Figure 6:** "Passive Residential Savings," "SWRCB Mandatory Prohibitions," and "Accelerate Implementation of Existing Water Conservation Program" actions from Worksheet 4 – Drought Response Actions of the DRT © 2015 Erler & Kalinowski, Inc.

*Default values for end use savings and implementation rates are provided based on a variety of local and regional water use studies and generalizations. However, all of these values may be adjusted by users based on their understanding of the*

*communities they serve and their intended implementation and enforcement actions, wherever possible.*

The suites of Actions and associated default water savings and implementation rates are presented in the following groupings and are based on the sources indicated in the Worksheet.

- **SWRCB Mandatory Prohibitions:** The May 2015 SWRCB regulation prohibits certain water uses by water customers (see Figure 6)[2].
- **Agency Drought Actions / Restrictions:** Potential Drought Response Actions and prohibitions that and agency may choose to implement are provided here and shown in Figure 6. These actions and prohibitions are grouped by (1) actions that can be taken by the agency, (2) actions/prohibitions specific to dedicated irrigation accounts, (3) actions/prohibitions that target residential water use, and (4) actions/prohibitions that target CII water use.
- **Customer Actions to Encourage:** These are Actions that the agency may encourage its customers to perform as part of a general education campaign targeting behavioral modifications. These actions are provided for informational purposes; the default savings values assume that the water savings associated with them are captured by an agency's overall public information campaign. Users can, however, adjust the assumed water savings and implementation rates to estimate the amount of additional savings anticipated by aggressively promoting these actions.

### 3.5 Worksheet 5 – Estimated Water Savings

Worksheet 5 displays the estimated potential monthly water production and savings for the drought year, compared to the Baseline Year(s) production data, and based on the selected suite of Drought Response Actions (and assumed end use savings estimates and implementation rates). As shown on Figure 7, tables and charts display how the estimated savings compare to the specified water use reduction goal by month and cumulatively during the drought year. Users may select the units that the data are displayed in from a drop down menu in the table header. If it appears that an agency will not meet its goal, cells in the Potential Cumulative Savings column will be highlighted in red.

[2] On 5 May 2015, SWRCB adopted Resolution 2015-0032 to mandate minimum actions by water suppliers and their customers to reduce potable water use into 2016 and assigned a mandatory water conservation savings goal to each water supplier based on their residential water use. On 2 February 2016, the SWRCB voted to extend the emergency regulation through October 2016.

**Figure 7:** *Worksheet 5 – Estimated Water Savings* of DRT © 2015 Erler & Kalinowski, Inc.

*It should be noted that the DRT is only a predictive tool that generates a water savings potential based on an assumed set of water use and savings inputs by the user, including Drought Response Actions, savings estimates, and implementation rates. The DRT in no way guarantees water savings or other performance metrics.*

### 3.6 Worksheet 6 – Drought Response Tracking

Worksheet 6 can be used to track an agency's water production/savings and progress towards meeting its water use reduction goal. Users can input their production data for the drought year. The monthly and cumulative savings compared to the Baseline Year(s) data are then calculated. As shown on Figure 8, tables and charts display these savings compared to the water use reduction goal entered in Worksheet 1. Users may select the units the data are displayed in from a drop down menu in the table header. If an agency did not meet its goal, cells in the Cumulative Savings column will be highlighted in red.

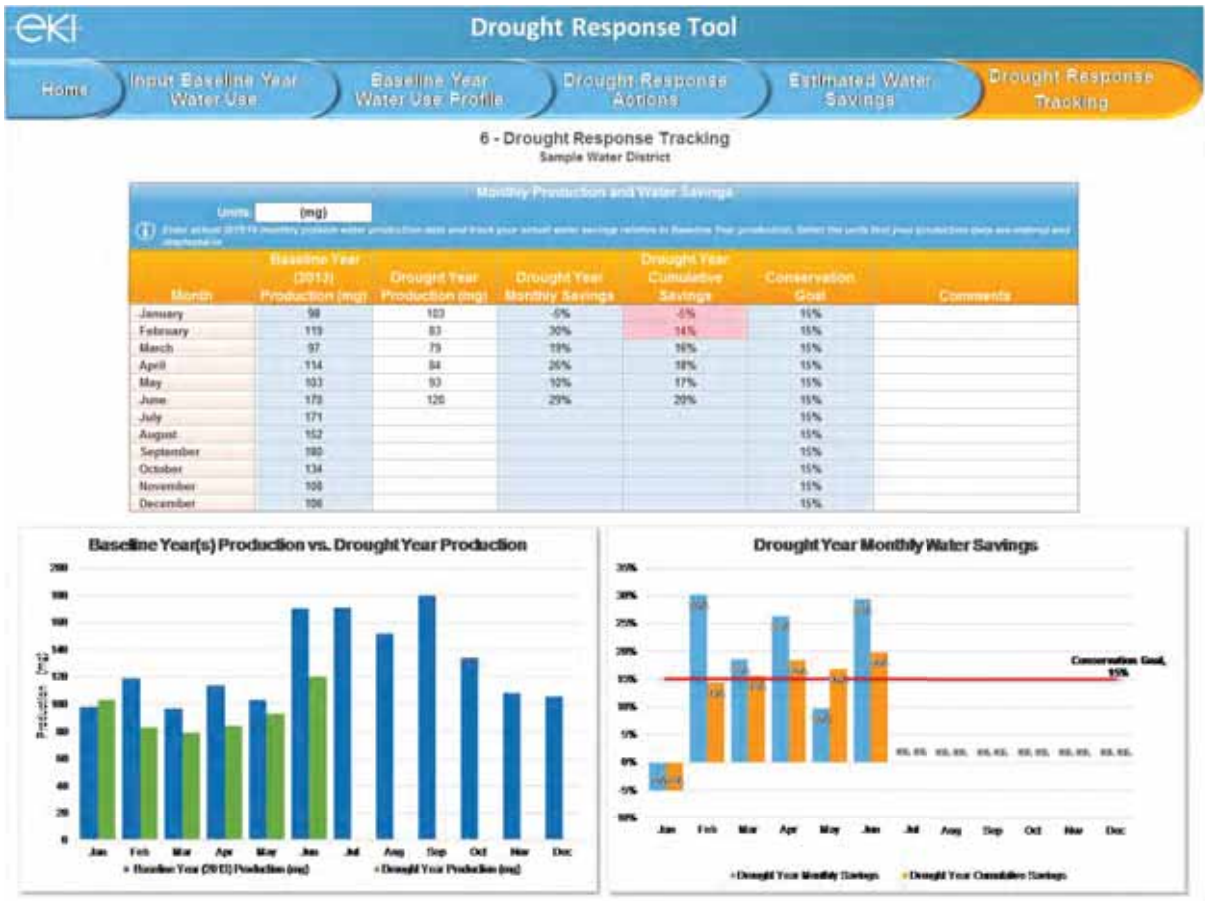



**Figure 8:** *Worksheet 6 – Drought Response Tracking* of DRT © 2015 Erler & Kalinowski, Inc.

For additional information and guidance, please contact Anona Dutton at adutton@ekiconsult.com or (650) 292-9100.

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# APPENDIX K:
# DROUGHT RESPONSE TOOL QUANTITATIVE ASSESSMENT

# Drought Response Tool



## 1 - Home

City of Burlingame

| Enter Agency Information | |
|---|---|
| Agency Name | City of Burlingame |
| Total Population Served | 31,355 |
| Conservation Goal (%) | |
| Number of Residential Accounts | 7,572 |
| Number of Commercial, Industrial, and Institutional (CII) Accounts | 934 |
| Number of Dedicated Irrigation Accounts | 199 |
| Baseline Year(s) | 2010 - 2014 |
| Comments | |

| Navigation | |
|---|---|
| USER'S GUIDE | Download and read the guide before using this Tool |
| 1 - HOME | Enter agency information |
| 2 - INPUT BASELINE YEAR WATER USE | Enter Baseline Year production and use |
| 3 - BASELINE YEAR WATER USE | Review and confirm entered information |
| 4 - DROUGHT RESPONSE ACTIONS | Select Drought Response Actions and input estimated water savings and implementation rates. |
| 5 - ESTIMATED WATER SAVINGS | Review estimated water production and compare estimated savings to conservation target. |
| 6 - DROUGHT RESPONSE TRACKING | Track production and water savings against the conservation target. |



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# Drought Response Tool



## 1 - Home

**City of Burlingame**

For questions about this tool or for additional information, contact:

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adutton@ekiconsult.com
**(650) 292-9100**

Erler & Kalinowski, Inc.
Consulting Engineers and Scientists

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# Drought Response Tool



## 2 - Input Baseline Year (2010 - 2014) Water Use

City of Burlingame

### Input Baseline Year (2010 - 2014) Production and Water Use

Units: (mg)

*Select the units to input monthly production and use data. Enter the total monthly potable water production for the Baseline Year. Next, enter monthly water use data by sector for the Baseline Year. If you bill on a bi-monthly basis, divide your billing data between the months that the billing cycle includes. If your single-family and multi-family accounts are tracked separately, enter the combined water use for both sectors in the Residential Water Use column. If your commercial, industrial, and institutional (CII) accounts are tracked separately, enter the combined water use for each sector in the CII Water Use column. Your non-revenue water use is calculated by subtracting your monthly residential, CII, and dedicated irrigation water uses from your monthly production. Your monthly residential gallons per capita per day (R-GPCD) is calculated by dividing your monthly residential water use by your population entered in Worksheet 1 - Home.*

| Date | Total Production (mg) | Residential Water Use (mg) | CII Water Use (mg) | Dedicated Irrigation Water Use (mg) | Non-Revenue Water Use (mg) | R-GPCD | Comments |
|---|---|---|---|---|---|---|---|
| January | 102 | 60.4 | 29.6 | 3.0 | 9 | 62 | Values are a 2-month rolling average |
| February | 96 | 56.8 | 29.1 | 2.1 | 8 | 65 | to adjust for bi-monthly billing. |
| March | 93 | 54.5 | 29.2 | 2.1 | 8 | 56 | |
| April | 94 | 53.4 | 29.9 | 2.9 | 8 | 57 | |
| May | 100 | 58.0 | 30.2 | 3.3 | 8 | 60 | |
| June | 124 | 69.6 | 35.6 | 7.7 | 11 | 74 | |
| July | 142 | 82.3 | 36.9 | 8.8 | 14 | 85 | |
| August | 160 | 92.6 | 39.7 | 10.3 | 17 | 95 | |
| September | 163 | 94.0 | 40.7 | 10.6 | 17 | 100 | |
| October | 152 | 89.2 | 37.6 | 9.0 | 16 | 92 | |
| November | 139 | 80.1 | 35.9 | 8.1 | 15 | 85 | |
| December | 114 | 67.7 | 30.6 | 3.9 | 12 | 70 | |



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# Drought Response Tool

Home | Input Baseline Year Water Use | Baseline Year Water Use Profile | Drought Response Actions | Estimated Water Savings | Drought Response Tracking

## 3 - Baseline Year (2010 - 2014) Water Use Profile

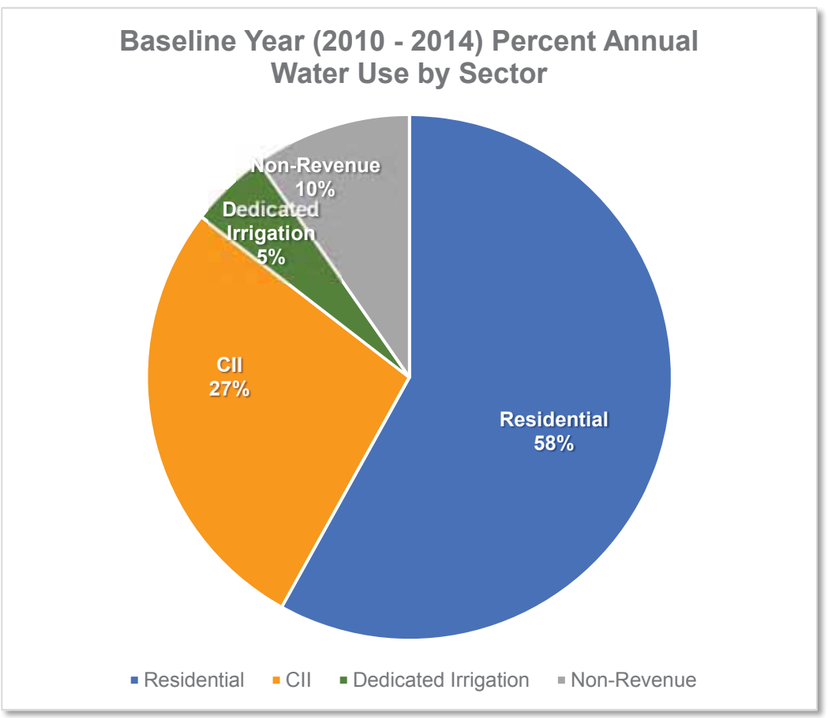
City of Burlingame

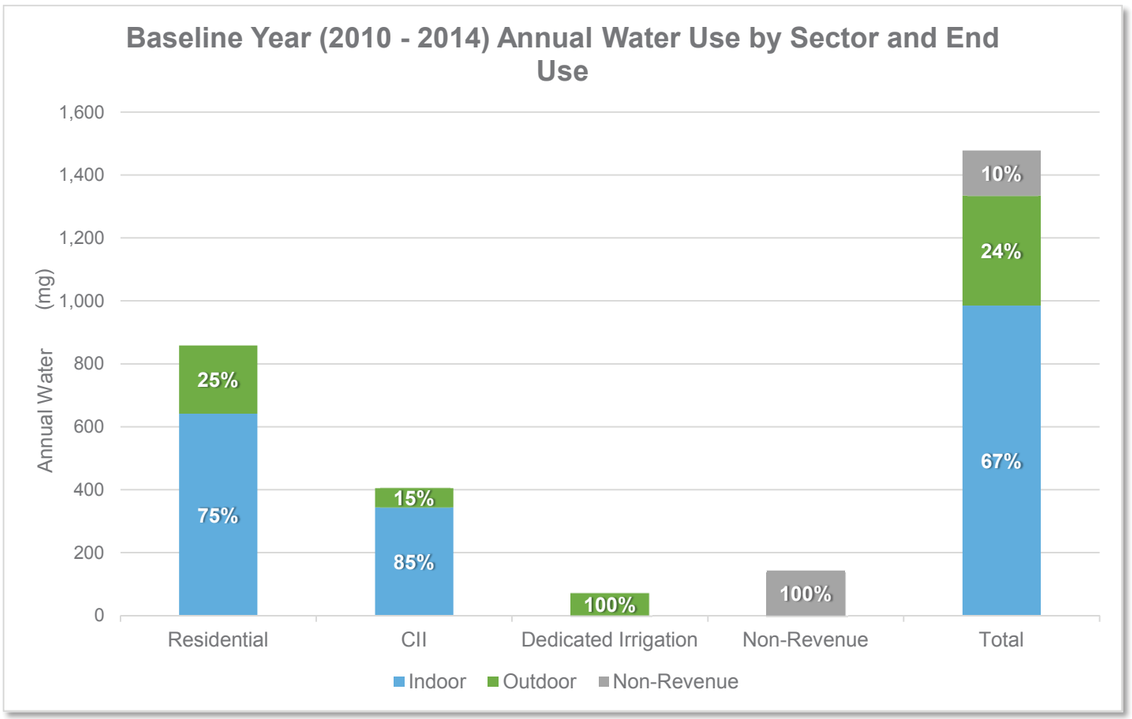
### Baseline Year (2010 - 2014) Annual Water Use Summary

Units: (mg)

*A summary of your Baseline Year water use by sector and major end use category is shown below. Select the units in which your production and use data are displayed.*

| Water Use | Total Production (mg) | Water Use (mg) | | | | Comments |
|---|---|---|---|---|---|---|
| | | Residential | CII | Dedicated Irrigation | Non-Revenue | |
| Total | 1,478 | 858 | 405 | 72 | 143 | |
| Total Indoor | 985 | 642 | 343 | -- | -- | |
| Total Outdoor | 350 | 217 | 62 | 72 | -- | |
| Total Non-Revenue | 143 | -- | -- | -- | 143 | |
| Total Indoor % | 67% | 75% | 85% | 0% | -- | |
| Total Outdoor % | 24% | 25% | 15% | 100% | -- | |
| Total Non-Revenue % | 10% | -- | -- | -- | 100% | |







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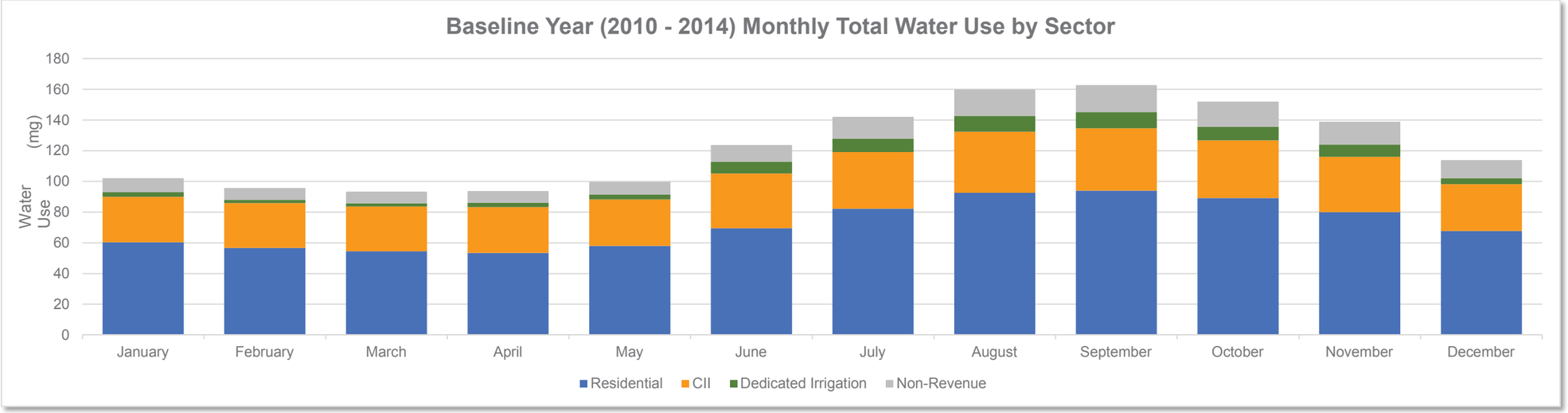
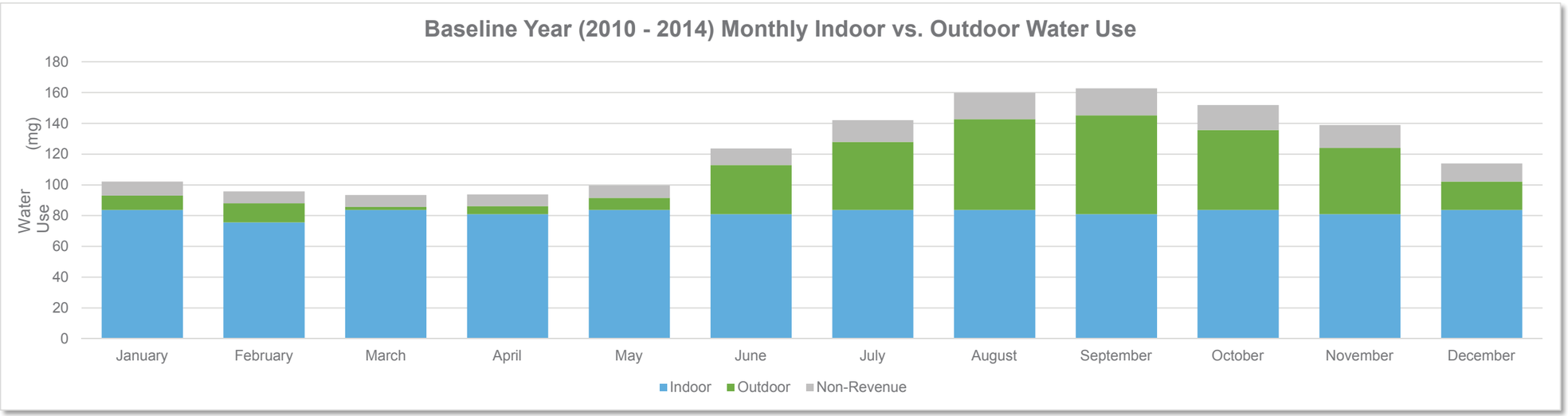
## 3 - Baseline Year (2010 - 2014) Water Use Profile

City of Burlingame



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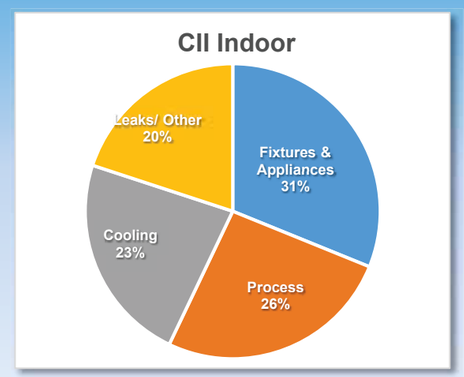
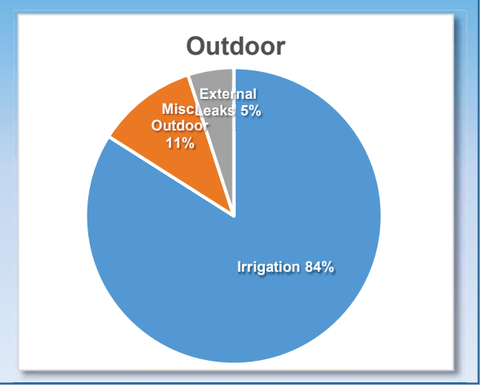
## 4 - Drought Response Actions

City of Burlingame

| Maximum Savings Potential | | |
|---|---|---|
| *Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.* | | |
| **Minimum Residential Indoor GPCD** | 40 | R-GPCD |
| **Maximum Residential Outdoor Savings** | 100% | of Baseline Residential Outdoor Water Use |
| **Maximum CII Indoor Savings** | 10% | of Baseline CII Indoor Water Use |
| **Maximum CII Outdoor Savings** | 75% | of Baseline CII Outdoor Water Use |
| **Maximum Dedicated Irrigation Account Savings** | 75% | of Baseline Dedicated Irrigation Water Use |
| **Maximum Non-Revenue Water Savings** | 50% | of Baseline Non-Revenue Water Use |
| **Resulting Total Maximum June 2015 to May 2016 Annual Savings Potential** | 41% | of Total Baseline Production |

**Assumed Proportion of Water Use by End Uses and Sector**



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## 4 - Drought Response Actions

City of Burlingame

### Drought Response Actions

*Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.*

| Action Description | End Use(s) | Implement Program | End Use Savings (%) | Implementation Rate | Source of Default Savings Estimate | Source of Default Implementation Rate |
|---|---|---|---|---|---|---|
| ► **Possible Mandatory Prohibitions** | All Outdoor | ☐ | 14% | 50% | -- | -- |
| Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems | Irrigation | ☐ | | | -- | -- |
| Require Shut-Off Nozzles on Hoses for Vehicle Washing | Misc. Outdoor | ☑ | 17% | 50% | See Appendix D of the DRP | -- |
| Prohibit Use of Potable Water to Wash Sidewalks and Driveways | Misc. Outdoor | ☑ | 17% | 50% | | -- |
| Prohibit the Use of Potable Water for Street Washing | Misc. Outdoor | ☐ | 17% | 50% | | -- |
| Prohibit Irrigation with Potable Water in a Manner that causes Runoff | Irrigation | ☑ | 3% | 50% | DeOreo et al., 2011 | -- |
| Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall | Irrigation | ☑ | | | -- | -- |
| Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians | Irrigation | ☑ | | | -- | -- |
| Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water | Misc. Outdoor | ☑ | 50% | 50% | EBMUD, 2008 | -- |
| Provide Linen Service Opt Out Options | Fixtures & Appliances | ☑ | 0.5% | 50% | EBMUD, 2011 | -- |
| Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments | Fixtures & Appliances | ☑ | 0.5% | 50% | EBMUD, 2011 | -- |



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## 4 - Drought Response Actions

City of Burlingame

| Drought Response Actions | | | | | | |
|---|---|---|---|---|---|---|
| Action Description | End Use(s) | Implement Program | End Use Savings (%) | Implementation Rate | Source of Default Savings Estimate | Source of Default Implementation Rate |
| ► Agency Drought Actions / Restrictions | | | | | | |
| ► Agency Actions | | | | | | |
| Media Campaign, Newspaper Articles, Website | All | ☑ | 0.5% | 50% | EBMUD, 2011 | -- |
| Promote Water Conservation / Rebate Programs | All | ☑ | **0.5%** | 50% | -- | -- |
| Water Efficiency Workshops, Public Events | All | ☐ | 0.5% | 25% | EBMUD, 2011 | -- |
| Water Bill Inserts | All | ☑ | 0.5% | 100% | EBMUD, 2011 | -- |
| Promote / Expand Use of Recycled Water | Irrigation | ☐ | 100% | | -- | -- |
| Home or Mobile Water Use Reports | All | ☐ | 5% | 10% | WaterSmart Software, 2015 | -- |
| Decrease Frequency and Length of Line Flushing | Non Revenue Water | ☐ | 25% | 50% | See Appendix D of the DRP | Reduced flushing by 50%. |
| Audit and Reduce System Water Loss | Non Revenue Water | ☐ | 45% | 50% | DWR, 2015 | Target 50% of leakage. |
| Implement Drought Rate Structure / Water Budgets | All | ☐ | 5% | 100% | CUWCC, 2015 | -- |
| Establish Retrofit on Resale Ordinance | All Residential Indoor | ☐ | 21% | 6% | SFPUC, 2004 | First Tuesday, 2015 |
| Require Net Zero Demand Increase on New Connections | All | ☐ | | | -- | -- |
| Moratorium on New Connections | All | ☐ | | | -- | -- |
| Move to Monthly Metering / Billing | All | ☐ | 5% | 10% | See Appendix D of the DRP | -- |
| Increase Water Waste Patrols / Enforcement | All | ☐ | | | -- | -- |
| Establish Drought Hotline | All | ☐ | | | -- | -- |
| Reduce Distribution System Pressures | Non Revenue Water | ☐ | 4.5% | 100% | CUWCC, 2010; DWR, 2015 | -- |
| ► Dedicated Irrigation | | | | | | |
| Conduct Irrigation Account Surveys | Irrigation | ☐ | 30% | 10% | EBMUD, 2011 | -- |
| Limit Irrigation Days, Time and Duration (Select One) | | | | | | |
| Limit Irrigation to 3 Days/Week, Between 9PM and 6AM | Irrigation | ☑ | **17%** | 50% | UC IPM, 2014 | -- |
| Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM | Irrigation | ☐ | 79% | 50% | | |
| Prohibit use of Potable Water for Irrigation | Irrigation | ☐ | 100% | 50% | | |
| Require Repair of all Leaks within 24 hours | External Leaks | ☑ | 100% | 5% | -- | -- |
| - OR - | | | | | | |
| Establish Water Budget - 25% Reduction | Irrigation | ☐ | 25% | 50% | -- | -- |
| Establish Water Budget - 50% Reduction | Irrigation | ☐ | 50% | 50% | -- | -- |
| Establish Water Budget - 75% Reduction | Irrigation | ☐ | 75% | 50% | -- | -- |



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## 4 - Drought Response Actions

City of Burlingame

| Drought Response Actions | | | | | | |
|---|---|---|---|---|---|---|
| Action Description | End Use(s) | Implement Program | End Use Savings (%) | Implementation Rate | Source of Default Savings Estimate | Source of Default Implementation Rate |
| ► Agency Drought Actions / Restrictions | | | | | | |
| ► Residential | | | | | | |
| Conduct Water Use Surveys Targeting High Water Users | All Residential Uses | ☐ | 10% | 10% | EBMUD, 2011 | -- |
| Limit Irrigation Days, Time and Duration (Select One) | | | | | | |
| Limit Irrigation to 3 Days/Week, Between 9PM and 6AM | Irrigation | ☑ | **17%** | 50% | UC IPM, 2014 | -- |
| Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM | Irrigation | ☐ | 79% | 50% | | |
| Prohibit use of Potable Water for Irrigation | Irrigation | ☐ | 100% | 50% | | |
| Prohibit Vehicle Washing Except with Recycled Water | Misc. Outdoor | ☐ | 50% | 50% | EBMUD, 2008 | -- |
| Require Repair of all Leaks within 24 hours | Leaks | ☑ | 100% | 5% | -- | -- |
| Require Pool Covers | Misc. Outdoor | ☐ | 28% | 25% | Maddaus & Mayer, 2001 | -- |
| Prohibit Filling of Pools | Misc. Outdoor | ☐ | 55% | 25% | DeOreo et al., 2011 | -- |
| - OR - | | | | | | |
| Establish Water Budget - 10% Reduction | All Residential Uses | ☐ | 10% | 50% | -- | -- |
| Establish Water Budget - 20% Reduction | All Residential Uses | ☐ | 20% | 50% | -- | -- |
| ► CII | | | | | | |
| Conduct CII Surveys Targeting High Water Users | All CII uses | ☐ | 10% | 10% | EBMUD, 2011 | -- |
| Limit Irrigation Days, Time and Duration (Select One) | | | | | | |
| Limit Irrigation to 3 Days/Week, Between 9PM and 6AM | Irrigation | ☑ | **17%** | 50% | UC IPM, 2014 | -- |
| Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM | Irrigation | ☐ | 79% | 50% | | |
| Prohibit Use of Potable Water for Construction and Dust Control | Misc. Outdoor | ☐ | | 100% | -- | -- |
| Prohibit Single-Pass Cooling Systems | Cooling | ☐ | 80% | 1% | Vickers, 2001 | -- |
| Require Repair of all Leaks within 24 hours | Leaks | ☑ | 100% | 5% | -- | -- |
| Prohibit Vehicle Washing Except with Recycled Water | Misc. Outdoor | ☐ | 50% | 50% | EBMUD, 2008 | -- |
| Require Water-Efficient Pre-Rinse Spray Valves | Fixtures & Appliances | ☐ | 0.8% | 50% | EPA, 2015; Pacific Institute, 2003 | -- |
| - OR - | | | | | | |
| Establish Water Budget - 10% Reduction | All CII uses | ☐ | 10% | 50% | -- | -- |
| Establish Water Budget - 20% Reduction | All CII uses | ☐ | 20% | 50% | -- | -- |
| Establish Water Budget - 30% Reduction | All CII uses | ☐ | 30% | 50% | -- | -- |



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## 4 - Drought Response Actions

City of Burlingame

| Drought Response Actions | | | | | | |
|---|---|---|---|---|---|---|
| Action Description | End Use(s) | Implement Program | End Use Savings (%) | Implementation Rate | Source of Default Savings Estimate | Source of Default Implementation Rate |
| ▶ Residential Customer Actions to Encourage | | | | | | |
| Install Bathroom Faucet Aerators | Faucets and Dishwashers | ☐ | | | -- | -- |
| Install a Water-Efficient Showerhead | Showers/Baths | ☐ | | | -- | -- |
| Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking | Faucets and Dishwashers | ☐ | | | -- | -- |
| Fill the Bathtub Halfway | Showers/Baths | ☐ | | | -- | -- |
| Wash Only Full Loads of Clothes | Clothes Washers | ☐ | | | -- | -- |
| Install a High-Efficiency Toilet | Toilets | ☐ | | | -- | -- |
| Take Shorter Showers | Showers/Baths | ☐ | | | -- | -- |
| Run Dishwasher Only When Full | Faucets and Dishwashers | ☐ | | | -- | -- |
| Reduce Outdoor Irrigation | Irrigation | ☐ | | | -- | -- |
| Install Drip-Irrigation | Irrigation | ☐ | | | -- | -- |
| Use Mulch | Irrigation | ☐ | | | -- | -- |
| Plant Drought Resistant Trees and Plants | Irrigation | ☐ | | | -- | -- |
| Use a Broom to Clean Outdoor Areas | Misc. Outdoor | ☐ | | | -- | -- |
| Flush Less Frequently | Toilets | ☐ | | | -- | -- |
| Re-Use Shower or Bath Water for Irrigation | Irrigation | ☐ | | | -- | -- |
| Wash Car at Facility that Recycles the Water | Misc. Outdoor | ☐ | | | -- | -- |



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## 5 - Estimated Water Savings

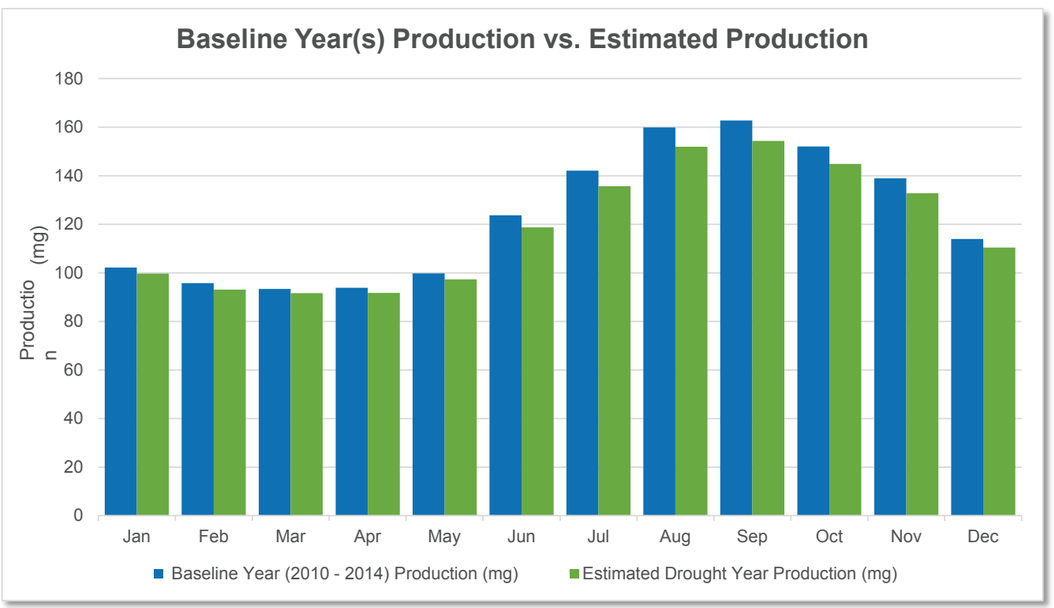
City of Burlingame

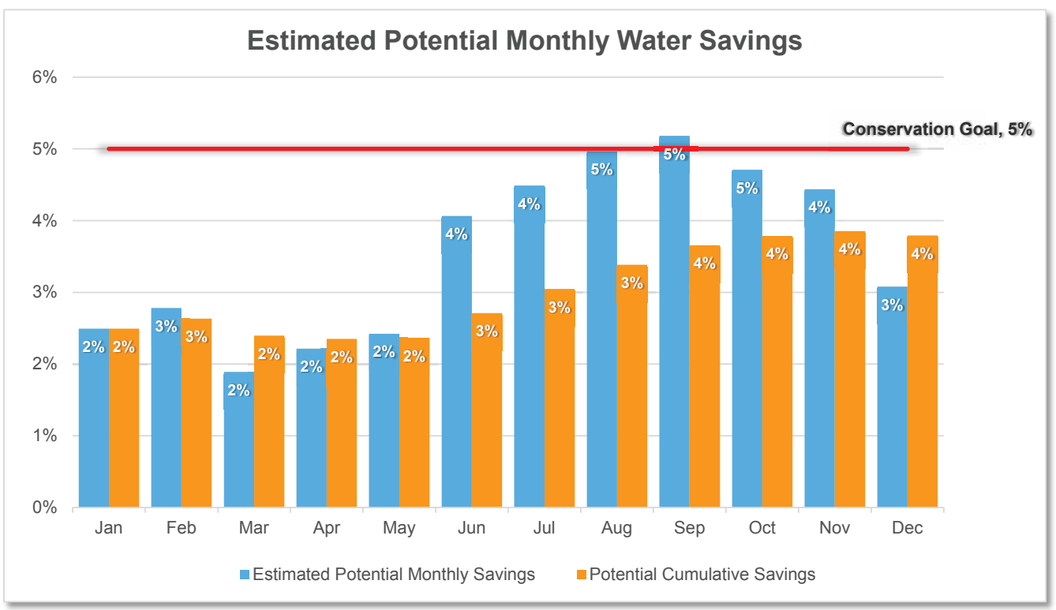
### Estimated Monthly Water Use and Savings Summary

Units: (mg)

*This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.*

| Month | Baseline Year (2010 - 2014) Production (mg) | Estimated Drought Year Production (mg) | Estimated Potential Monthly Savings | Potential Cumulative Savings | Conservation Goal | Comments |
|---|---|---|---|---|---|---|
| January | 102 | 100 | 2% | 2% | 5% | |
| February | 96 | 93 | 3% | 3% | 5% | |
| March | 93 | 92 | 2% | 2% | 5% | |
| April | 94 | 92 | 2% | 2% | 5% | |
| May | 100 | 97 | 2% | 2% | 5% | |
| June | 124 | 119 | 4% | 3% | 5% | |
| July | 142 | 136 | 4% | 3% | 5% | |
| August | 160 | 152 | 5% | 3% | 5% | |
| September | 163 | 154 | 5% | 4% | 5% | |
| October | 152 | 145 | 5% | 4% | 5% | |
| November | 139 | 133 | 4% | 4% | 5% | |
| December | 114 | 110 | 3% | 4% | 5% | |



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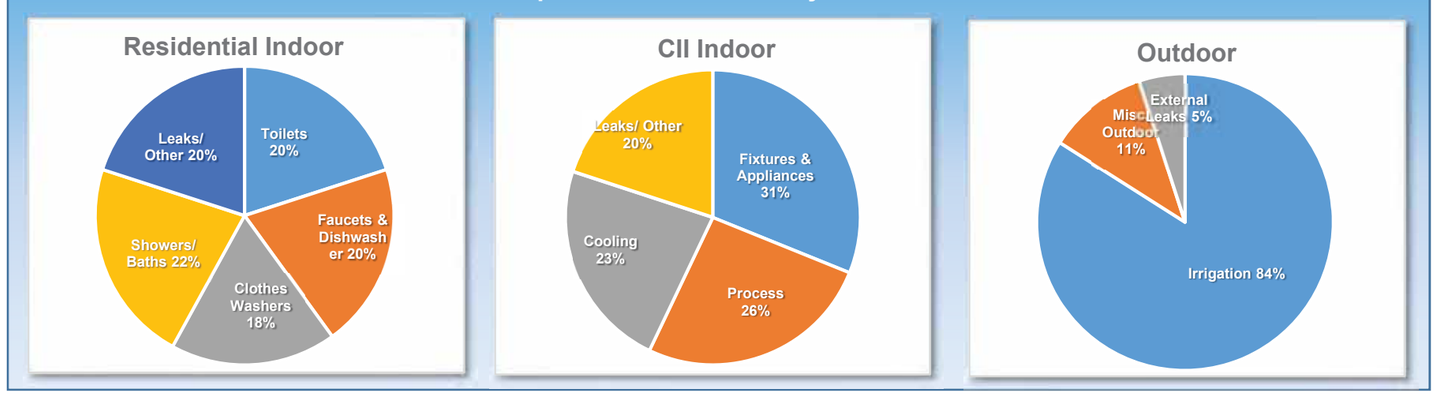
## 4 - Drought Response Actions

City of Burlingame

| Maximum Savings Potential | | |
|---|---|---|
| *Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.* | | |
| Minimum Residential Indoor GPCD | 40 | R-GPCD |
| Maximum Residential Outdoor Savings | 100% | of Baseline Residential Outdoor Water Use |
| Maximum CII Indoor Savings | 10% | of Baseline CII Indoor Water Use |
| Maximum CII Outdoor Savings | 75% | of Baseline CII Outdoor Water Use |
| Maximum Dedicated Irrigation Account Savings | 75% | of Baseline Dedicated Irrigation Water Use |
| Maximum Non-Revenue Water Savings | 50% | of Baseline Non-Revenue Water Use |
| Resulting Total Maximum June 2015 to May 2016 Annual Savings Potential | 41% | of Total Baseline Production |

### Assumed Proportion of Water Use by End Uses and Sector



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## 4 - Drought Response Actions

City of Burlingame

### Drought Response Actions

*Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.*

| Action Description | End Use(s) | Implement Program | End Use Savings (%) | Implementation Rate | Source of Default Savings Estimate | Source of Default Implementation Rate |
|---|---|---|---|---|---|---|
| ► **Possible Mandatory Prohibitions** | All Outdoor | ☑ | **30%** | 50% | -- | -- |
| Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems | Irrigation | ☑ | | | -- | -- |
| Require Shut-Off Nozzles on Hoses for Vehicle Washing | Misc. Outdoor | ☑ | 17% | 50% | See Appendix D of the DRP | -- |
| Prohibit Use of Potable Water to Wash Sidewalks and Driveways | Misc. Outdoor | ☑ | 17% | 50% | | -- |
| Prohibit the Use of Potable Water for Street Washing | Misc. Outdoor | ☑ | 17% | 50% | | -- |
| Prohibit Irrigation with Potable Water in a Manner that causes Runoff | Irrigation | ☑ | 3% | 50% | DeOreo et al., 2011 | -- |
| Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall | Irrigation | ☑ | | | -- | -- |
| Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians | Irrigation | ☑ | | | -- | -- |
| Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water | Misc. Outdoor | ☑ | 50% | 50% | EBMUD, 2008 | -- |
| Provide Linen Service Opt Out Options | Fixtures & Appliances | ☑ | 0.5% | 50% | EBMUD, 2011 | -- |
| Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments | Fixtures & Appliances | ☑ | 0.5% | 50% | EBMUD, 2011 | -- |



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## 4 - Drought Response Actions

City of Burlingame

| Drought Response Actions | | | | | | |
|---|---|---|---|---|---|---|
| **Action Description** | **End Use(s)** | **Implement Program** | **End Use Savings (%)** | **Implementation Rate** | **Source of Default Savings Estimate** | **Source of Default Implementation Rate** |
| **► Agency Drought Actions / Restrictions** | | | | | | |
| **► Agency Actions** | | | | | | |
| Media Campaign, Newspaper Articles, Website | All | ☑ | 0.5% | 50% | EBMUD, 2011 | -- |
| Promote Water Conservation / Rebate Programs | All | ☑ | **0.5%** | 50% | -- | -- |
| Water Efficiency Workshops, Public Events | All | ☐ | 0.5% | 25% | EBMUD, 2011 | -- |
| Water Bill Inserts | All | ☑ | 0.5% | 100% | EBMUD, 2011 | -- |
| Promote / Expand Use of Recycled Water | Irrigation | ☐ | 100% | | -- | -- |
| Home or Mobile Water Use Reports | All | ☐ | 5% | 10% | WaterSmart Software, 2015 | -- |
| Decrease Frequency and Length of Line Flushing | Non Revenue Water | ☑ | 25% | 50% | See Appendix D of the DRP | Reduced flushing by 50%. |
| Audit and Reduce System Water Loss | Non Revenue Water | ☐ | 45% | 50% | DWR, 2015 | Target 50% of leakage. |
| Implement Drought Rate Structure / Water Budgets | All | ☐ | 5% | 100% | CUWCC, 2015 | -- |
| Establish Retrofit on Resale Ordinance | All Residential Indoor | ☐ | 21% | 6% | SFPUC, 2004 | First Tuesday, 2015 |
| Require Net Zero Demand Increase on New Connections | All | ☐ | | | -- | -- |
| Moratorium on New Connections | All | ☐ | | | -- | -- |
| Move to Monthly Metering / Billing | All | ☐ | 5% | 10% | See Appendix D of the DRP | -- |
| Increase Water Waste Patrols / Enforcement | All | ☐ | | | -- | -- |
| Establish Drought Hotline | All | ☑ | **0.5%** | **10%** | -- | -- |
| Reduce Distribution System Pressures | Non Revenue Water | ☐ | 4.5% | 100% | CUWCC, 2010; DWR, 2015 | -- |
| **► Dedicated Irrigation** | | | | | | |
| Conduct Irrigation Account Surveys | Irrigation | ☐ | 30% | 10% | EBMUD, 2011 | -- |
| Limit Irrigation Days, Time and Duration (Select One) | | | | | | |
| Limit Irrigation to 3 Days/Week, 15 Minutes/Day, Between 9PM and 6AM | Irrigation | ☑ | **38%** | 50% | UC IPM, 2014 | -- |
| Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM | Irrigation | ☐ | 79% | 50% | | |
| Prohibit use of Potable Water for Irrigation | Irrigation | ☐ | 100% | 50% | | |
| Require Repair of all Leaks within 24 hours | External Leaks | ☑ | 100% | 5% | -- | -- |
| **- OR -** | | | | | | |
| Establish Water Budget - 25% Reduction | Irrigation | ☐ | 25% | 50% | -- | -- |
| Establish Water Budget - 50% Reduction | Irrigation | ☐ | 50% | 50% | -- | -- |
| Establish Water Budget - 75% Reduction | Irrigation | ☐ | 75% | 50% | -- | -- |



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## 4 - Drought Response Actions

City of Burlingame

| Drought Response Actions | | | | | | |
|---|---|---|---|---|---|---|
| **Action Description** | **End Use(s)** | **Implement Program** | **End Use Savings (%)** | **Implementation Rate** | **Source of Default Savings Estimate** | **Source of Default Implementation Rate** |
| **▶ Agency Drought Actions / Restrictions** | | | | | | |
| **▶ Residential** | | | | | | |
| Conduct Water Use Surveys Targeting High Water Users | All Residential Uses | ☐ | 10% | 10% | EBMUD, 2011 | -- |
| Limit Irrigation Days, Time and Duration (Select One) | | | | | | |
| Limit Irrigation to 3 Days/Week, 15 Minutes/Day, Between 9PM and 6AM | Irrigation | ☑ | **38%** | 50% | UC IPM, 2014 | -- |
| Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM | Irrigation | ☐ | 79% | 50% | | |
| Prohibit use of Potable Water for Irrigation | Irrigation | ☐ | 100% | 50% | | |
| Prohibit Vehicle Washing Except with Recycled Water | Misc. Outdoor | ☐ | 50% | 50% | EBMUD, 2008 | -- |
| Require Repair of all Leaks within 24 hours | Leaks | ☑ | 100% | 5% | -- | -- |
| Require Pool Covers | Misc. Outdoor | ☑ | 28% | 25% | Maddaus & Mayer, 2001 | -- |
| Suspend building permits for new pools, spas, hot tubs | Misc. Outdoor | ☑ | 55% | 25% | DeOreo et al., 2011 | -- |
| **- OR -** | | | | | | |
| Establish Water Budget - 10% Reduction | All Residential Uses | ☐ | 10% | 50% | -- | -- |
| Establish Water Budget - 20% Reduction | All Residential Uses | ☐ | 20% | 50% | -- | -- |
| **▶ CII** | | | | | | |
| Conduct CII Surveys Targeting High Water Users | All CII uses | ☐ | 10% | 10% | EBMUD, 2011 | -- |
| Limit Irrigation Days, Time and Duration (Select One) | | | | | | |
| Limit Irrigation to 3 Days/Week, 15 Minutes/Day, Between 9PM and 6AM | Irrigation | ☑ | **38%** | 50% | UC IPM, 2014 | -- |
| Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM | Irrigation | ☐ | 79% | 50% | | |
| Prohibit Use of Potable Water for Construction and Dust Control | Misc. Outdoor | ☐ | | 100% | -- | -- |
| Prohibit Single-Pass Cooling Systems | Cooling | ☑ | 80% | 1% | Vickers, 2001 | -- |
| Require Repair of all Leaks within 24 hours | Leaks | ☑ | 100% | 5% | -- | -- |
| Prohibit Vehicle Washing Except with Recycled Water | Misc. Outdoor | ☐ | 50% | 50% | EBMUD, 2008 | -- |
| Require Water-Efficient Pre-Rinse Spray Valves | Fixtures & Appliances | ☐ | 0.8% | 50% | EPA, 2015; Pacific Institute, 2003 | -- |
| **- OR -** | | | | | | |
| Establish Water Budget - 10% Reduction | All CII uses | ☐ | 10% | 50% | -- | -- |
| Establish Water Budget - 20% Reduction | All CII uses | ☐ | 20% | 50% | -- | -- |
| Establish Water Budget - 30% Reduction | All CII uses | ☐ | 30% | 50% | -- | -- |



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## 4 - Drought Response Actions

City of Burlingame

| Drought Response Actions | | | | | | |
|---|---|---|---|---|---|---|
| Action Description | End Use(s) | Implement Program | End Use Savings (%) | Implementation Rate | Source of Default Savings Estimate | Source of Default Implementation Rate |
| ▶ Residential Customer Actions to Encourage | | | | | | |
| Install Bathroom Faucet Aerators | Faucets and Dishwashers | ☐ | | | -- | -- |
| Install a Water-Efficient Showerhead | Showers/Baths | ☐ | | | -- | -- |
| Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking | Faucets and Dishwashers | ☐ | | | -- | -- |
| Fill the Bathtub Halfway | Showers/Baths | ☐ | | | -- | -- |
| Wash Only Full Loads of Clothes | Clothes Washers | ☐ | | | -- | -- |
| Install a High-Efficiency Toilet | Toilets | ☐ | | | -- | -- |
| Take Shorter Showers | Showers/Baths | ☐ | | | -- | -- |
| Run Dishwasher Only When Full | Faucets and Dishwashers | ☐ | | | -- | -- |
| Reduce Outdoor Irrigation | Irrigation | ☐ | | | -- | -- |
| Install Drip-Irrigation | Irrigation | ☐ | | | -- | -- |
| Use Mulch | Irrigation | ☐ | | | -- | -- |
| Plant Drought Resistant Trees and Plants | Irrigation | ☐ | | | -- | -- |
| Use a Broom to Clean Outdoor Areas | Misc. Outdoor | ☐ | | | -- | -- |
| Flush Less Frequently | Toilets | ☐ | | | -- | -- |
| Re-Use Shower or Bath Water for Irrigation | Irrigation | ☐ | | | -- | -- |
| Wash Car at Facility that Recycles the Water | Misc. Outdoor | ☐ | | | -- | -- |



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## 5 - Estimated Water Savings

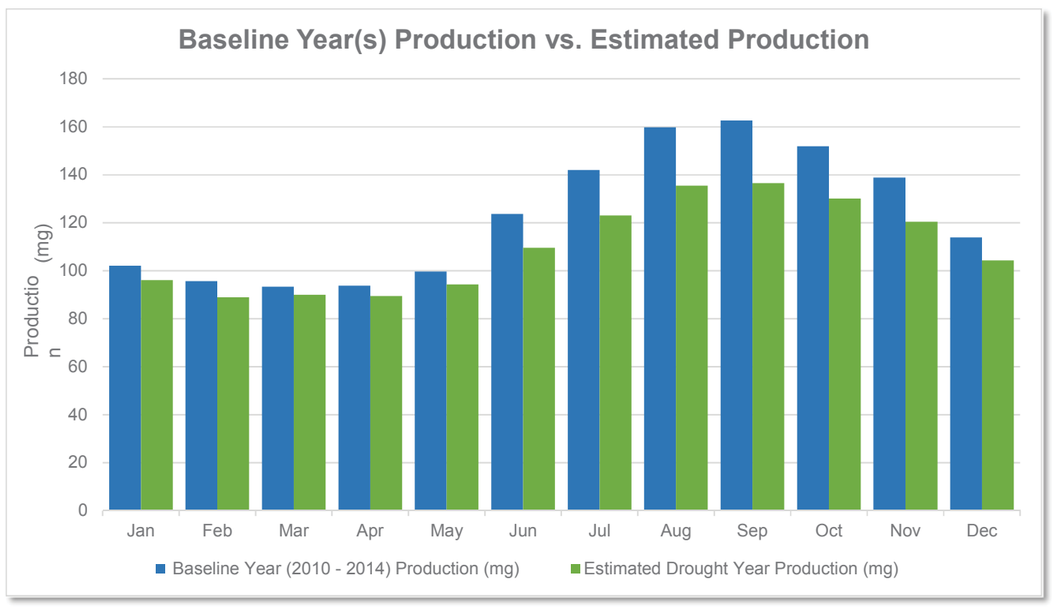
City of Burlingame

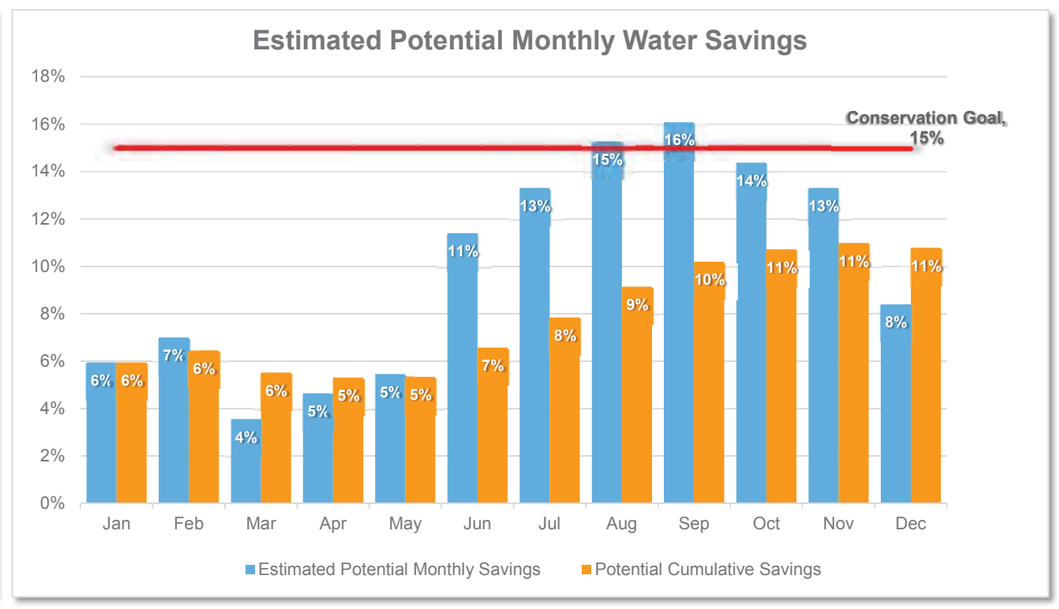
### Estimated Monthly Water Use and Savings Summary

Units: (mg)

*This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.*

| Month | Baseline Year (2010 - 2014) Production (mg) | Estimated Drought Year Production (mg) | Estimated Potential Monthly Savings | Potential Cumulative Savings | Conservation Goal | Comments |
|---|---|---|---|---|---|---|
| January | 102 | 96 | 6% | 6% | 15% | |
| February | 96 | 89 | 7% | 6% | 15% | |
| March | 93 | 90 | 4% | 6% | 15% | |
| April | 94 | 89 | 5% | 5% | 15% | |
| May | 100 | 94 | 5% | 5% | 15% | |
| June | 124 | 110 | 11% | 7% | 15% | |
| July | 142 | 123 | 13% | 8% | 15% | |
| August | 160 | 135 | 15% | 9% | 15% | |
| September | 163 | 137 | 16% | 10% | 15% | |
| October | 152 | 130 | 14% | 11% | 15% | |
| November | 139 | 120 | 13% | 11% | 15% | |
| December | 114 | 104 | 8% | 11% | 15% | |



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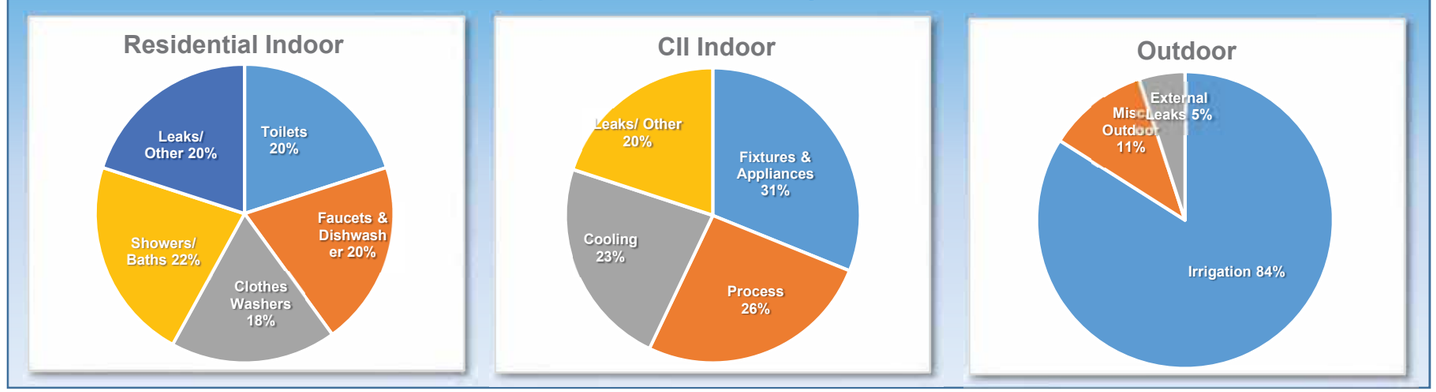
## 4 - Drought Response Actions

City of Burlingame

| Maximum Savings Potential | | |
|---|---|---|
| *Use the default values or enter your own criteria for the maximum savings potential. Estimated water savings within each sector will not exceed the maximum savings criteria.* | | |
| Minimum Residential Indoor GPCD | 40 | R-GPCD |
| Maximum Residential Outdoor Savings | 100% | of Baseline Residential Outdoor Water Use |
| Maximum CII Indoor Savings | 10% | of Baseline CII Indoor Water Use |
| Maximum CII Outdoor Savings | 75% | of Baseline CII Outdoor Water Use |
| Maximum Dedicated Irrigation Account Savings | 75% | of Baseline Dedicated Irrigation Water Use |
| Maximum Non-Revenue Water Savings | 50% | of Baseline Non-Revenue Water Use |
| Resulting Total Maximum June 2015 to May 2016 Annual Savings Potential | 41% | of Total Baseline Production |

### Assumed Proportion of Water Use by End Uses and Sector



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## 4 - Drought Response Actions

City of Burlingame

### Drought Response Actions

*Select the Drought Response Actions you would like to include in your estimated savings calculations. For each selected action, use the default end use savings estimates and implementation rates or input your own values. The "End Use Savings" estimates the percent water use reduction that could occur at a particular end use as a result of a specific action. The "Implementation Rate" refers to the estimated percentage of accounts that will implement a specific action. The water savings potential at each end use is capped based on the assumed distribution of end use water demands shown in the pie charts above. A dash (--) indicates that professional judgement was used to establish the default value, or that savings are expected to be accounted for as part of a Public Information Program; additional basis for the default values are included in the User Manual.*

| Action Description | End Use(s) | Implement Program | End Use Savings (%) | Implementation Rate | Source of Default Savings Estimate | Source of Default Implementation Rate |
|---|---|---|---|---|---|---|
| ► **Possible Mandatory Prohibitions** | All Outdoor | ☑ | **30%** | 50% | -- | -- |
| Prohibit Irrigation with Potable Water Outside of Newly Constructed Homes and Buildings that is not Delivered by Drip or Microspray Systems | Irrigation | ☑ | | | -- | -- |
| Require Shut-Off Nozzles on Hoses for Vehicle Washing | Misc. Outdoor | ☑ | 17% | 50% | See Appendix D of the DRP | -- |
| Prohibit Use of Potable Water to Wash Sidewalks and Driveways | Misc. Outdoor | ☑ | 17% | 50% | | -- |
| Prohibit the Use of Potable Water for Street Washing | Misc. Outdoor | ☑ | 17% | 50% | | -- |
| Prohibit Irrigation with Potable Water in a Manner that causes Runoff | Irrigation | ☑ | 3% | 50% | DeOreo et al., 2011 | -- |
| Prohibit Irrigation with Potable Water within 48 Hours following Measurable Rainfall | Irrigation | ☑ | | | -- | -- |
| Prohibit Irrigation of Ornamental Turf with Potable Water on Street Medians | Irrigation | ☑ | | | -- | -- |
| Prohibit Potable Water Use for Decorative Water Features that do not Recirculate Water | Misc. Outdoor | ☑ | 50% | 50% | EBMUD, 2008 | -- |
| Provide Linen Service Opt Out Options | Fixtures & Appliances | ☑ | 0.5% | 50% | EBMUD, 2011 | -- |
| Prohibit Serving Drinking Water other than upon Request in Eating or Drinking Establishments | Fixtures & Appliances | ☑ | 0.5% | 50% | EBMUD, 2011 | -- |



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## 4 - Drought Response Actions

City of Burlingame

| Drought Response Actions | | | | | | |
|---|---|---|---|---|---|---|
| **Action Description** | **End Use(s)** | **Implement Program** | **End Use Savings (%)** | **Implementation Rate** | **Source of Default Savings Estimate** | **Source of Default Implementation Rate** |
| **► Agency Drought Actions / Restrictions** | | | | | | |
| **► Agency Actions** | | | | | | |
| Media Campaign, Newspaper Articles, Website | All | ☑ | 0.5% | **100%** | EBMUD, 2011 | -- |
| Promote Water Conservation / Rebate Programs | All | ☑ | **0.5%** | **100%** | -- | -- |
| Water Efficiency Workshops, Public Events | All | ☑ | 0.5% | **50%** | EBMUD, 2011 | -- |
| Water Bill Inserts | All | ☑ | 0.5% | 100% | EBMUD, 2011 | -- |
| Promote / Expand Use of Recycled Water | Irrigation | ☐ | 100% | | -- | -- |
| Home or Mobile Water Use Reports | All | ☐ | 5% | 10% | WaterSmart Software, 2015 | -- |
| Suspend Line Flushing | Non Revenue Water | ☑ | **100%** | **100%** | See Appendix D of the DRP | Suspend all flushing |
| Audit and Reduce System Water Loss | Non Revenue Water | ☐ | 45% | 50% | DWR, 2015 | Target 50% of leakage. |
| Implement Water Budgets for New Accounts | All | ☑ | 5% | **6%** | CUWCC, 2015 | -- |
| Establish Retrofit on Resale Ordinance | All Residential Indoor | ☐ | 21% | 6% | SFPUC, 2004 | First Tuesday, 2015 |
| Require Net Zero Demand Increase on New Connections | All | ☐ | | | -- | -- |
| Moratorium on New Connections | All | ☐ | | | -- | -- |
| Move to Monthly Metering / Billing | All | ☑ | 5% | 10% | See Appendix D of the DRP | -- |
| Increase Water Waste Patrols / Enforcement | All | ☑ | **5%** | **10%** | -- | -- |
| Establish Drought Hotline | All | ☑ | **0.5%** | **10%** | -- | -- |
| Reduce Distribution System Pressures | Non Revenue Water | ☐ | 4.5% | 100% | CUWCC, 2010; DWR, 2015 | -- |
| **► Dedicated Irrigation** | | | | | | |
| Conduct Irrigation Account Surveys | Irrigation | ☑ | 30% | 10% | EBMUD, 2011 | -- |
| Limit Irrigation Days, Time and Duration (Select One) | | | | | | |
| Limit Irrigation to 3 Days/Week, 15 Minutes/Day, Between 9PM and 6AM | Irrigation | ☐ | 38% | 50% | UC IPM, 2014 | -- |
| Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM | Irrigation | ☑ | 79% | 50% | | |
| Prohibit use of Potable Water for Irrigation | Irrigation | ☐ | 100% | 50% | | |
| Require Repair of all Leaks within 24 hours | External Leaks | ☑ | 100% | 5% | -- | -- |
| **- OR -** | | | | | | |
| Establish Water Budget - 25% Reduction | Irrigation | ☐ | 25% | 50% | -- | -- |
| Establish Water Budget - 50% Reduction | Irrigation | ☐ | 50% | 50% | -- | -- |
| Establish Water Budget - 75% Reduction | Irrigation | ☐ | 75% | 50% | -- | -- |



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## 4 - Drought Response Actions

City of Burlingame

| Drought Response Actions | | | | | | |
|---|---|---|---|---|---|---|
| Action Description | End Use(s) | Implement Program | End Use Savings (%) | Implementation Rate | Source of Default Savings Estimate | Source of Default Implementation Rate |
| ▶ **Agency Drought Actions / Restrictions** | | | | | | |
| ▶ **Residential** | | | | | | |
| Conduct Water Use Surveys Targeting High Water Users | All Residential Uses | ☑ | 10% | 10% | EBMUD, 2011 | -- |
| Limit Irrigation Days, Time and Duration (Select One) | | | | | | |
| Limit Irrigation to 3 Days/Week, 15 Minutes/Day, Between 9PM and 6AM | Irrigation | ☐ | 38% | 50% | UC IPM, 2014 | -- |
| Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM | Irrigation | ☑ | 79% | 50% | | |
| Prohibit use of Potable Water for Irrigation | Irrigation | ☐ | 100% | 50% | | |
| Prohibit Vehicle Washing Except with Recycled Water | Misc. Outdoor | ☑ | 50% | 50% | EBMUD, 2008 | -- |
| Require Repair of all Leaks within 24 hours | Leaks | ☑ | 100% | 5% | -- | -- |
| Require Pool Covers | Misc. Outdoor | ☑ | 28% | 25% | Maddaus & Mayer, 2001 | -- |
| Suspend building permits for new pools, spas, hot tubs | Misc. Outdoor | ☑ | 55% | 25% | DeOreo et al., 2011 | -- |
| **- OR -** | | | | | | |
| Establish Water Budget - 10% Reduction | All Residential Uses | ☐ | 10% | 50% | -- | -- |
| Establish Water Budget - 20% Reduction | All Residential Uses | ☐ | 20% | 50% | -- | -- |
| ▶ **CII** | | | | | | |
| Conduct CII Surveys Targeting High Water Users | All CII uses | ☑ | 10% | 10% | EBMUD, 2011 | -- |
| Limit Irrigation Days, Time and Duration (Select One) | | | | | | |
| Limit Irrigation to 3 Days/Week, 15 Minutes/Day, Between 9PM and 6AM | Irrigation | ☐ | 38% | 50% | UC IPM, 2014 | -- |
| Limit Irrigation to 1 Day/Week, 10 Minutes/Day, Between 9PM and 6AM | Irrigation | ☑ | 79% | 50% | | |
| Prohibit Use of Potable Water for Construction and Dust Control | Misc. Outdoor | ☐ | | 100% | -- | -- |
| Prohibit Single-Pass Cooling Systems | Cooling | ☑ | 80% | 1% | Vickers, 2001 | -- |
| Require Repair of all Leaks within 24 hours | Leaks | ☑ | 100% | 5% | -- | -- |
| Prohibit Vehicle Washing Except with Recycled Water | Misc. Outdoor | ☑ | 50% | 50% | EBMUD, 2008 | -- |
| Require Water-Efficient Pre-Rinse Spray Valves | Fixtures & Appliances | ☐ | 0.8% | 50% | EPA, 2015; Pacific Institute, 2003 | -- |
| **- OR -** | | | | | | |
| Establish Water Budget - 10% Reduction | All CII uses | ☐ | 10% | 50% | -- | -- |
| Establish Water Budget - 20% Reduction | All CII uses | ☐ | 20% | 50% | -- | -- |
| Establish Water Budget - 30% Reduction | All CII uses | ☐ | 30% | 50% | -- | -- |



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## 4 - Drought Response Actions

City of Burlingame

| Drought Response Actions | | | | | | |
|---|---|---|---|---|---|---|
| Action Description | End Use(s) | Implement Program | End Use Savings (%) | Implementation Rate | Source of Default Savings Estimate | Source of Default Implementation Rate |
| ▶ **Residential Customer Actions to Encourage** | | | | | | |
| Install Bathroom Faucet Aerators | Faucets and Dishwashers | ☐ | | | -- | -- |
| Install a Water-Efficient Showerhead | Showers/Baths | ☐ | | | -- | -- |
| Turn Off Water when Brushing Teeth, Shaving, Washing Dishes, or Cooking | Faucets and Dishwashers | ☐ | | | -- | -- |
| Fill the Bathtub Halfway | Showers/Baths | ☐ | | | -- | -- |
| Wash Only Full Loads of Clothes | Clothes Washers | ☐ | | | -- | -- |
| Install a High-Efficiency Toilet | Toilets | ☐ | | | -- | -- |
| Take Shorter Showers | Showers/Baths | ☐ | | | -- | -- |
| Run Dishwasher Only When Full | Faucets and Dishwashers | ☐ | | | -- | -- |
| Reduce Outdoor Irrigation | Irrigation | ☐ | | | -- | -- |
| Install Drip-Irrigation | Irrigation | ☐ | | | -- | -- |
| Use Mulch | Irrigation | ☐ | | | -- | -- |
| Plant Drought Resistant Trees and Plants | Irrigation | ☐ | | | -- | -- |
| Use a Broom to Clean Outdoor Areas | Misc. Outdoor | ☐ | | | -- | -- |
| Flush Less Frequently | Toilets | ☐ | | | -- | -- |
| Re-Use Shower or Bath Water for Irrigation | Irrigation | ☐ | | | -- | -- |
| Wash Car at Facility that Recycles the Water | Misc. Outdoor | ☐ | | | -- | -- |



Drought Response Tool
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## 5 - Estimated Water Savings

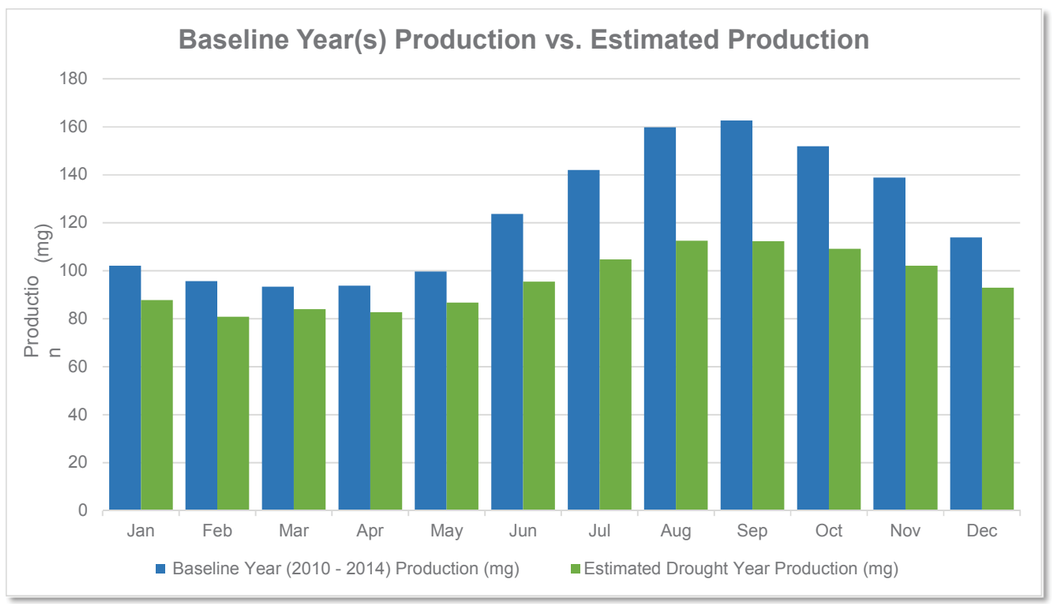
City of Burlingame

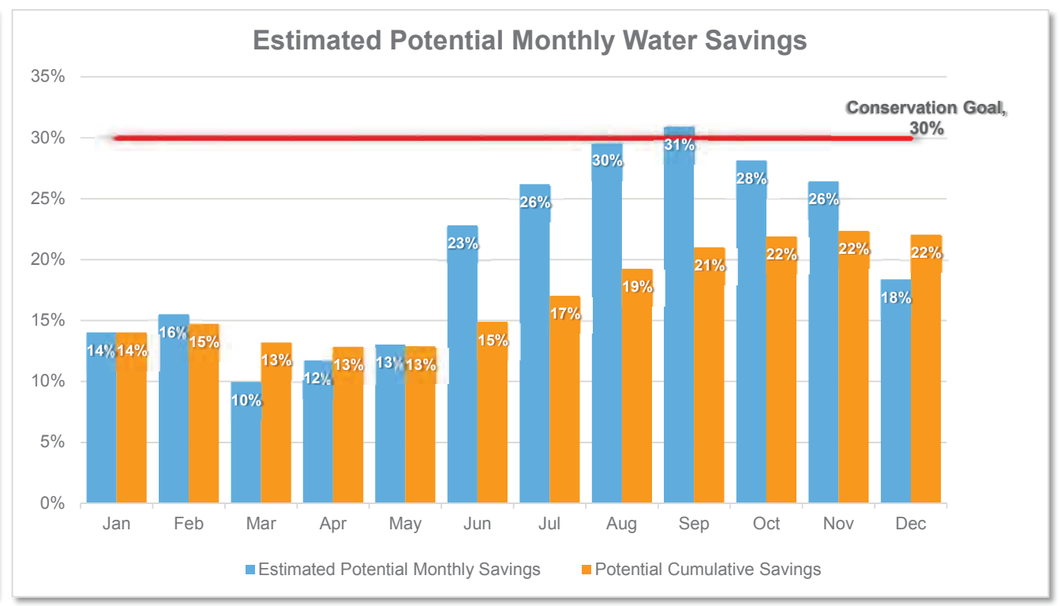
### Estimated Monthly Water Use and Savings Summary

Units: (mg)

*This provides a summary of the estimated production relative to Baseline Year production and potential water savings, assuming implementation of selected actions at the water savings and implementation rates indicated in the Drought Response Actions worksheet. Select the units that your production data are displayed in.*

| Month | Baseline Year (2010 - 2014) Production (mg) | Estimated Drought Year Production (mg) | Estimated Potential Monthly Savings | Potential Cumulative Savings | Conservation Goal | Comments |
|---|---|---|---|---|---|---|
| January | 102 | 88 | 14% | 14% | 30% | |
| February | 96 | 81 | 16% | 15% | 30% | |
| March | 93 | 84 | 10% | 13% | 30% | |
| April | 94 | 83 | 12% | 13% | 30% | |
| May | 100 | 87 | 13% | 13% | 30% | |
| June | 124 | 95 | 23% | 15% | 30% | |
| July | 142 | 105 | 26% | 17% | 30% | |
| August | 160 | 113 | 30% | 19% | 30% | |
| September | 163 | 112 | 31% | 21% | 30% | |
| October | 152 | 109 | 28% | 22% | 30% | |
| November | 139 | 102 | 26% | 22% | 30% | |
| December | 114 | 93 | 18% | 22% | 30% | |






**Drought Response Tool**
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# APPENDIX L:
# RESOLUTION NO. 58-2016, APPROVING AN URBAN WATER MANAGEMENT PLAN AND THE ASSOCIATED WATER SHORTAGE CONTINGENCY PLAN FOR THE CITY OF BURLINGAME

**RESOLUTION NO. 58-2016**

**A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF BURLINGAME APPROVING AN URBAN WATER MANAGEMENT PLAN AND THE ASSOCIATED WATER SHORTAGE CONTINGENCY PLAN FOR THE CITY OF BURLINGAME**

The City Council of the City of Burlingame, California resolves as follows:

**WHEREAS**, The Urban Water Management Planning Act (Act) requires water suppliers to prepare or update their Urban Water Management Plans (UWMPs) and submit a complete UWMP to the State of California Department of Water Resources every five years; and

**WHEREAS**, Burlingame's last UWMP was prepared and adopted in 2011, and the updated UWMP must be adopted by resolution prior to June 30, 2016; and

**WHEREAS**, UWMP's are planning documents prepared for water suppliers to assist them in the evaluation of adequate water supplies to meet anticipated future needs and to assist them in managing the efficient use of water within their service area; and

**WHEREAS**, as required by Senate Bill 7, the City must set gross per capita urban water use targets that must be achieved by 2015 and 2020; and

**WHEREAS**, for Burlingame, the per-capita urban water use targets are 142 gallons per capita, per day (gpcd) for 2015 and 135 gpcd for 2020; and

**WHEREAS,** Burlingame has surpassed its 2015 interim water use target, with an actual water use of 123 gpcd; and

**WHEREAS,** the Water Shortage Contingency Plan (WSCP), which is included as Section 7 of the UWMP, summarizes water use reduction measures and stages of action to be implemented by the City to meet different water use reduction targets; and

**WHEREAS**, the WSCP must be adopted by resolution or ordinance, but is considered a standalone section within the UWMP and can be modified at any time by the Council without formal amendment of the UWMP itself; and

**WHEREAS**, as required by the Water Conservation Act of 2009, the City must conduct a public hearing regarding the Urban Water Management Plan before the City adopts said plan; and

**WHEREAS**, Burlingame's draft UWMP has been prepared by Erler & Kalinowski, Inc., in accordance with the Act and in cooperation with the Bay Area Water Supply and Conservation Agency (BAWSCA), the San Francisco Public Utilities Commission, and the BAWSCA member agencies; and

**WHEREAS**, in accordance with the Act and other State laws, the City has notified the

public of the preparation of the draft UWMP and has made the document available for public review, and

**WHEREAS**, as of June 1, 2016, the City has not received any public or agency comments on the draft UWMP;

**NOW, THEREFORE BE IT RESOLVED, DETERMINED AND ORDERED BY THE COUNCIL, AS FOLLOWS:**

1. The City Council of the City of Burlingame finds all of the facts recited above, in the staff report and during the presentation of this matter, to be true and correct.

2. The City Council of the City of Burlingame approves the City of Burlingame Water Management Plan.

Mayor

I, Meaghan Hassel-Shearer, City Clerk of the City of Burlingame, do hereby certify that the foregoing Resolution was introduced at a regular meeting of the City Council held on the 6th day of June, 2016, and was adopted thereafter by the following vote:

AYES: Councilmembers: BEACH, BROWNRIGG, COLSON, KEIGHRAN

NOES: Councilmembers: NONE

ABSENT: Councilmembers: ORTIZ

City Clerk

# APPENDIX M:
# PLAN SUBMITTAL DOCUMENTATION

## Kat Wuelfing

**From:** Matt Zucca
**Sent:** Wednesday, May 18, 2016 3:52 PM
**To:** Kat Wuelfing
**Subject:** FW: Comments on BAWSCA draft Annual Survey
**Attachments:** Burlingame_current water rates.pdf; Table 8B markup.pdf

**Follow Up Flag:** Follow up
**Flag Status:** Flagged

**Matthew P. Zucca, P.E., QISP/ToR**
Principal Engineer
1870 Ogden Drive,
Burlingame, California 94010
P: 650.292.9100 | F: 650.552.9012
M:650.346.7033

---

**From:** Matt Zucca
**Sent:** Wednesday, April 27, 2016 11:55 AM
**To:** 'Andree Johnson' <AJohnson@bawsca.org>
**Cc:** Art Morimoto (amorimoto@burlingame.org) <amorimoto@burlingame.org>; Kat Wuelfing <kwuelfing@ekiconsult.com>
**Subject:** FW: Comments on BAWSCA draft Annual Survey

Andree – I wasn't clear when I sent the email below to Art and he thought it was as a cc on an email to you. Sorry for the delay in providing these comments. There is not much difference with the exception of rates (markups are in the attached PDF). But, Burlingame is in the middle of a rate study at the moment, so these will change again soon anyway.

**Matthew P. Zucca, P.E., QISP/ToR**
Principal Engineer
Erler & Kalinowski, Inc.
1870 Ogden Drive,
Burlingame, California 94010
P: 650.292.9100 | F: 650.552.9012
M: 650.346.7033
mzucca@ekiconsult.com
www.ekiconsult.com
37°35'35.29"N 122°23'16.50"W

We've reviewed the BAWSCA draft annual survey. The Purchases from SF RWS in Table 3D-1 should be revised as below, to be consistent with the UWMP demand projections.

Purchases from SF RWS (in mgd)

| | FY 2015-16 | FY 2020-21 | FY 2025-26 | FY 2030-31 | FY 2035-36 | FY 2040-41 |
|---|---|---|---|---|---|---|
| Draft Annual Survey: | 3.67 | 4.94 | 5.01 | 5.10 | 5.21 | 5.42 |
| **Revise to:** | **3.58** | **4.97** | **5.02** | **5.10** | **5.21** | **5.41** |

Note, BAWSCA is showing a lower amount of active conservation (as a "supply") than the DSS model predicts. Given that BAWSCA's numbers are lower, it should be fine to leave it as is. Just an FYI that the numbers are different.

The population projection (Table 6) for 2015 only should be revised to be consistent with the UWMP:

Population Projections

| | FY 2015-16 | FY 2020-21 | FY 2025-26 | FY 2030-31 | FY 2035-36 | FY 2040-41 |
|---|---|---|---|---|---|---|
| Draft Annual Survey: | 31,355 | 34,051 | 35,009 | 36,051 | 37,104 | 39,530 |
| **Revise to:** | **32,993** | 34,051 | 35,009 | 36,051 | 37,104 | 39,530 |

The service area population shown in Tables 7A and 7* and used to calculate per capita consumption for FY2014-15 should be revised as well.

Population and Per Capita Consumption

| | Population | Residential Per Capita Consumption (gpcd) | Gross Per Capita Consumption (gpcd) |
|---|---|---|---|
| Draft Annual Survey: | 30,282 | 67.7 | 121.2 |
| **Revise to:** | **32,993** | **62.1** | **111.3** |

Table 8B of the draft report shows water rates and the average single family monthly water bill. This table has several errors, including the incorrect service charge and rates. I believe the average monthly bill is also being calculated incorrectly given that Burlingame bills bimonthly. Attached is a PDF with comments on the incorrect numbers and Burlingame's current rate schedule.

Erler & Kalinowski, Inc.

**Consulting Engineers and Scientists**

1870 Ogden Drive
Burlingame, CA 94010
(650) 292-9100
Fax: (650) 552-9012

# LETTER OF TRANSMITTAL

**TO:** California State Library
Government Publications Section
P.O. Box 942837
Sacramento, CA 94237-0001

**Attn: Coordinator, Urban Water Management Plans**

**DATE:** 24 June 2016
**PROJ. NO.** A20031.27
**SUBJECT:** City of Burlingame 2015 Urban Water Management Plan

**WE ARE SENDING YOU THE FOLLOWING:**

1. CD ROM of the City of Burlingame – 2015 Urban Water Management Plan

**REMARKS:**

In accordance with California Water Code §10644, Erler & Kalinowski Inc. is pleased to submit the adopted 2015 Urban Water Management Plan to the California State Library on the behalf of the City of Burlingame.

**COPY TO:**

EKI Project File (w/o enclosure)
Art Morimoto, P.E. (City w/o enclosure)

**Very truly yours,**

**ERLER & KALINOWSKI, INC.**

Matthew P. Zucca, P.E., QISP/ToR
Project Manager

*If enclosures are not as noted, please advise us at once at (650) 292-9100.*

Erler & Kalinowski, Inc.

**Consulting Engineers and Scientists**

1870 Ogden Drive
Burlingame, CA 94010
(650) 292-9100
Fax: (650) 552-9012

# LETTER OF TRANSMITTAL

**TO:** Jim Porter
Director of Public Works, San Mateo County
555 County Center, 5th Floor
Redwood City, CA 94063

**DATE:** 24 June 2016
**PROJ. NO.** A20031.27
**SUBJECT:** City of Burlingame 2015 Urban Water Management Plan

**WE ARE SENDING YOU THE FOLLOWING:**

1. CD ROM of the City of Burlingame – 2015 Urban Water Management Plan

**REMARKS:**

In accordance with California Water Code §10644, Erler & Kalinowski Inc. is pleased to submit the adopted 2015 Urban Water Management Plan to the San Mateo County on the behalf of the City of Burlingame.

**COPY TO:**

EKI Project File (w/o enclosure)
Art Morimoto, P.E. (City w/o enclosure)

**Very truly yours,**

**ERLER & KALINOWSKI, INC.**

Matthew P. Zucca, P.E., QISP/ToR
Project Manager

*If enclosures are not as noted, please advise us at once at (650) 292-9100.*