

**City and County of San Francisco Comments
on the State Water Resources Control Board
Substitute Environmental Document
in Support of Potential Changes to the
Water Quality Control Plan for the San
Francisco Bay-Sacramento/San Joaquin
Delta Estuary: San Joaquin River Flows and
Southern Delta Water Quality**

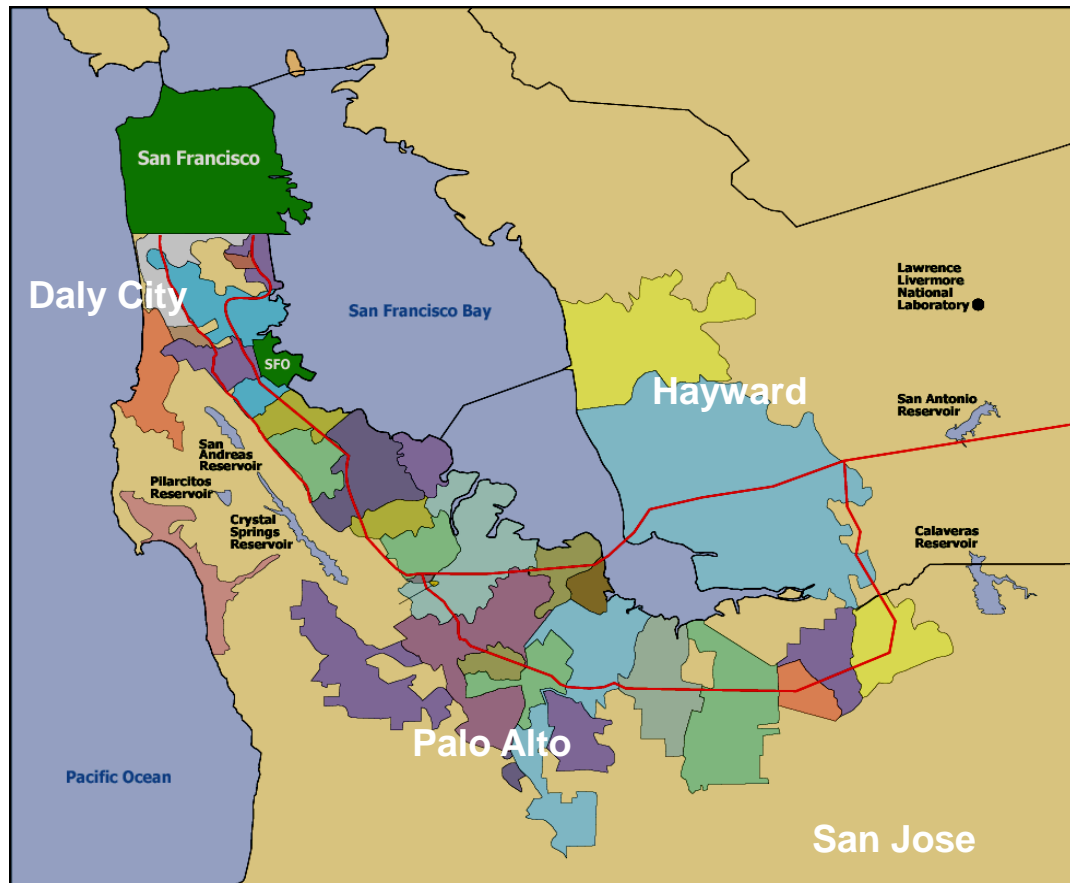
March 21, 2013

**Ellen Levin, Deputy Manager, Water Enterprise
Donn Furman, Deputy City Attorney, San Francisco
Dan Steiner, Consultant
David Sunding, Consultant**

- SFPUC owns and operates a regional water system (RWS)
 - Serves 2.6 million people in San Francisco, San Mateo, Alameda Santa Clara and Tuolumne Counties
 - The system currently delivers an annual average of 238 mgd
 - 85% is from the Tuolumne River through Hetch Hetchy reservoir
 - 15% is from the combined Alameda and Peninsula watersheds through five reservoirs: Calaveras, San Antonio, Crystal Springs, San Andreas and Pilarcitos
 - During drought Hetch Hetchy can provide up to 93% of total water delivered
 - The Hetch Hetchy system also generates peaking capacity of ~400 MW of hydroelectric power

- The RWS is operated under a water first policy
 - Codified in Water Code section 73504(b); the San Francisco Charter; and the SFPUC's Water Supply Agreement with its wholesale customers
- The SFPUC level of service goals:
 - Require no greater than 20% rationing in any one year of a drought
 - Improve use of new water sources and drought management including use of groundwater, recycled water, conservation and transfers
- The Water Supply Agreement contains a Water Shortage Allocation Plan for shortages up to 20%

SFPUC Water Customers

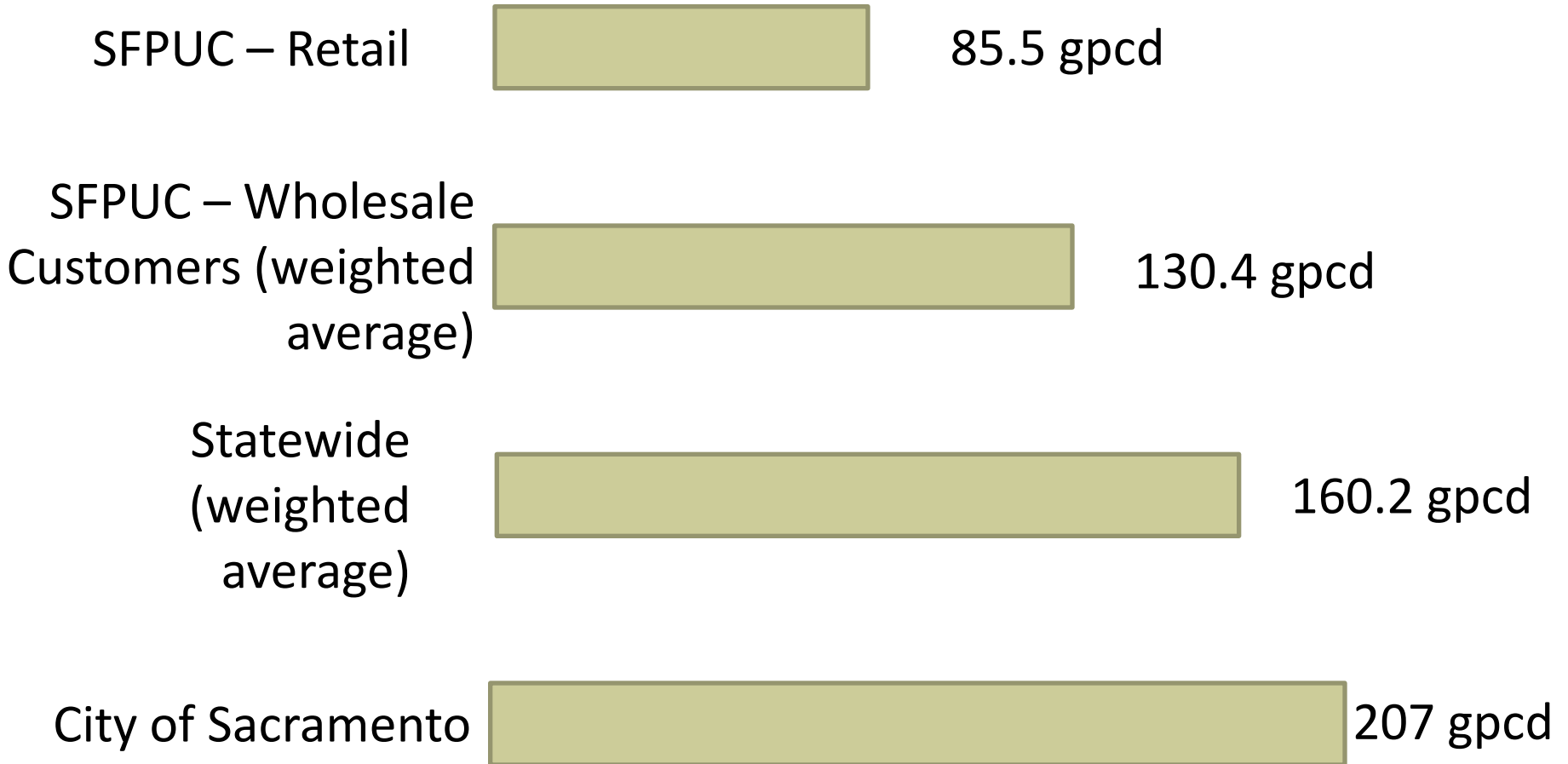


SFPUC Service Area Demands

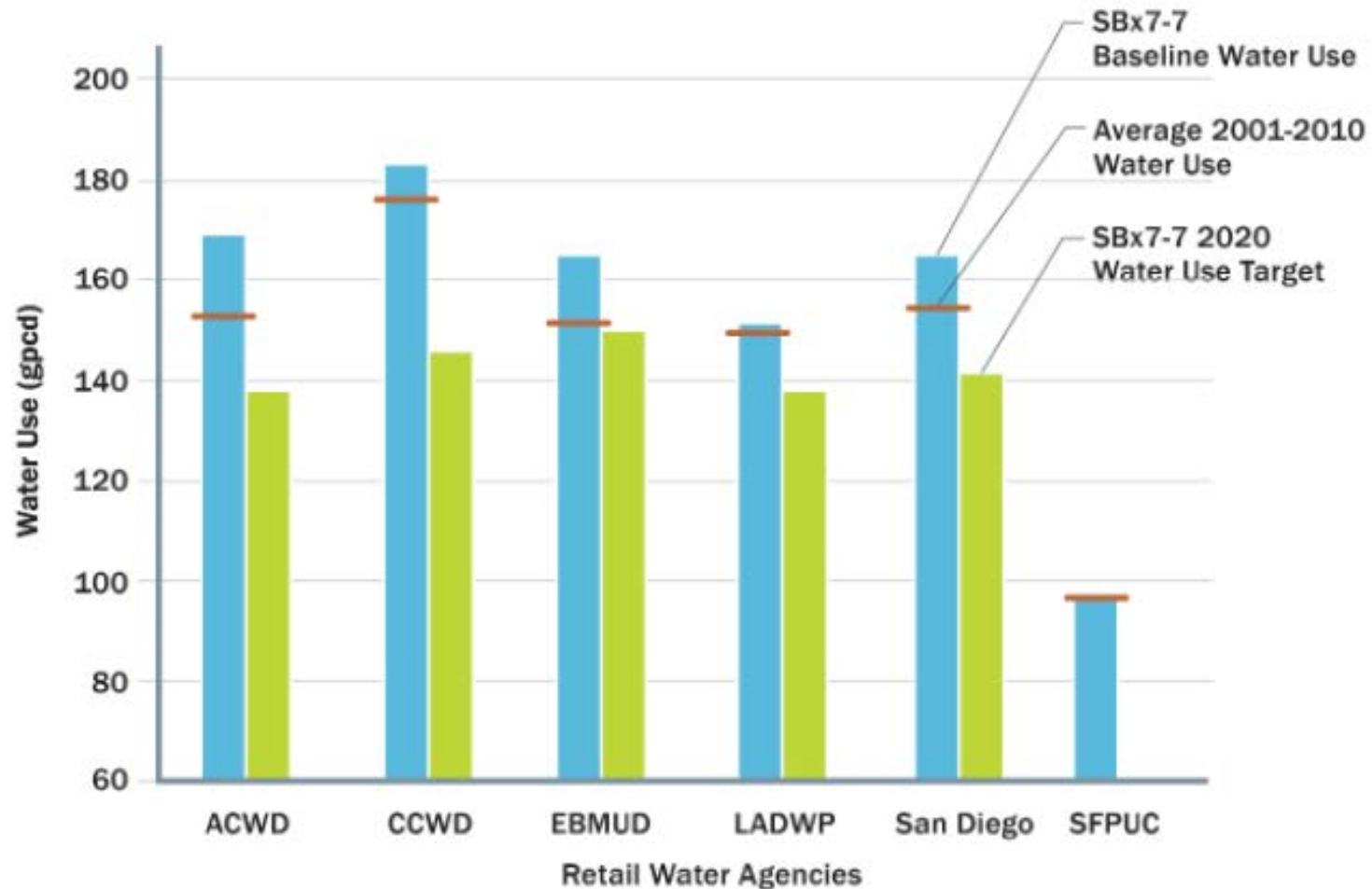
- San Francisco Retail Demand – FY 2010-11 demand 78 mgd
 - 96% from SFPUC Regional Water System supplies
 - 4% from groundwater
- Wholesale Customer Service Area – FY 2010-11 demand 220.91 mgd
 - 64% from SFPUC Regional Water System supplies
 - 12.8% from groundwater
 - 3% from recycled water
 - 3.4% from surface water
 - 15.9% from other sources (State Water Project, Santa Clara Valley Water District)



FY 2009/10 Gross Per Capita Use



Current SFPUC per capita use is low compared to peers



**Source of figure: CUWA Water Supply Reliability Report; Data from 2010 UWMPs*



Water Supply Shortfalls: Drought and Future Demand

- **Drought**
 - Water Shortage Allocation Plan allocates water between the Retail and Wholesale customers up to 20% shortage on the RWS
 - Wholesale customers have an allocation agreement amongst themselves
 - Certain wholesale customers experience 40% shortage with a 20% shortage on the RWS
 - Requires SFPUC and its wholesale customers to develop water supplies to meet these shortages
- **Future Demand**
 - Retail and Wholesale customers will have demand growth
 - Requires the development of water supplies to meet future demand

Alternative Water Supply Development to Meet Current and Future Demand

- SFPUC Projects:
 - Recycled water projects
 - Other non-potable supply development in San Francisco including graywater reuse, rainwater harvesting, stormwater capture, and foundation drainage use
 - Groundwater development in San Francisco
 - Water conservation programs
 - Conjunctive use project to meet dry-year needs
 - Regional desalination
 - Water transfers

Alternative Water Supply Development to Meet Current and Future Demand

- Wholesale Customer Service Area Projects:
 - Recycled water projects
 - Groundwater projects
 - Local capture and reuse including rainwater harvesting, stormwater capture and graywater reuse
 - Conservation programs
 - Desalination projects including coastal projects, Bay water projects and brackish groundwater desalination
 - Water transfers

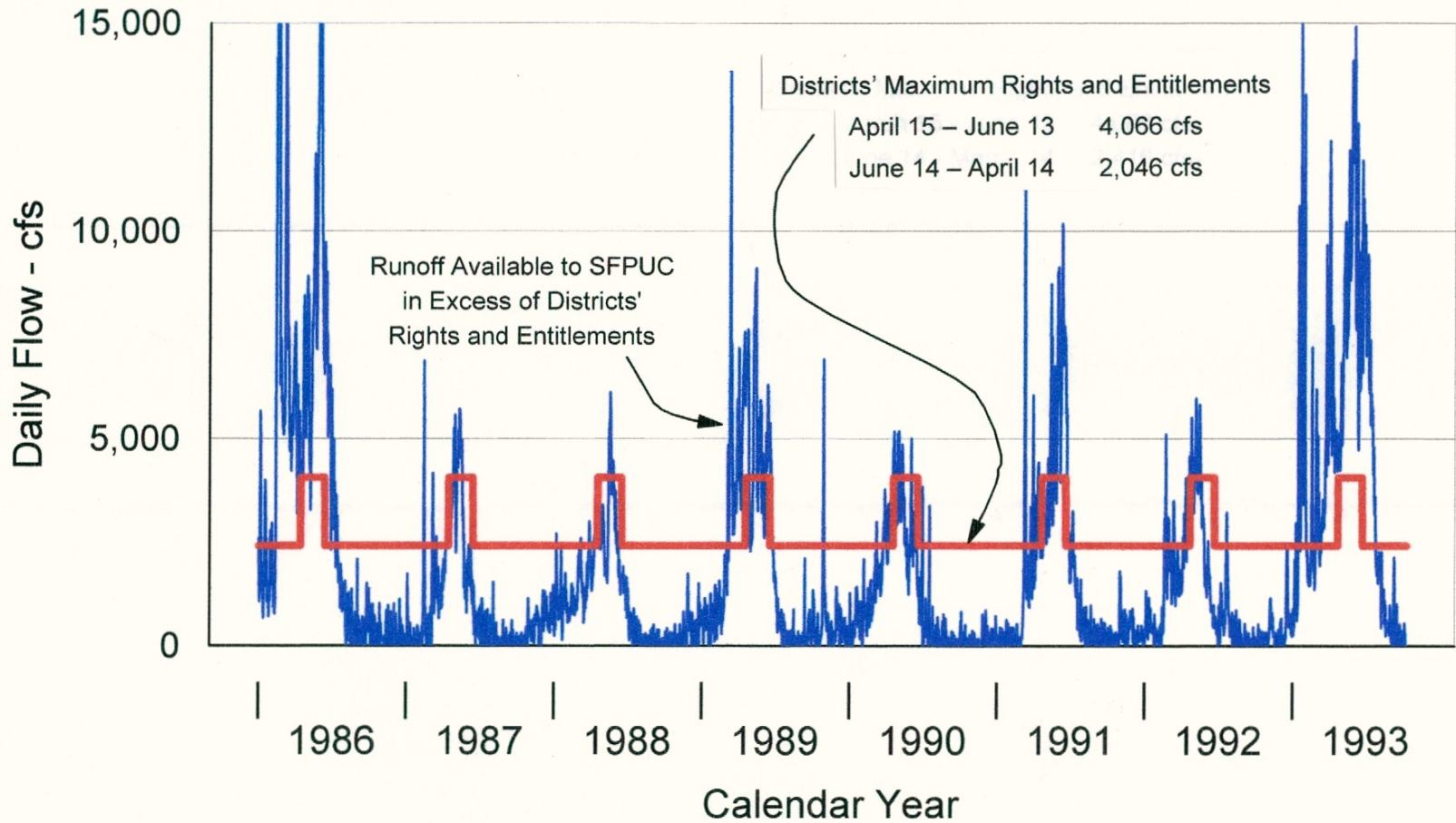
Raker Act and Fourth Agreement



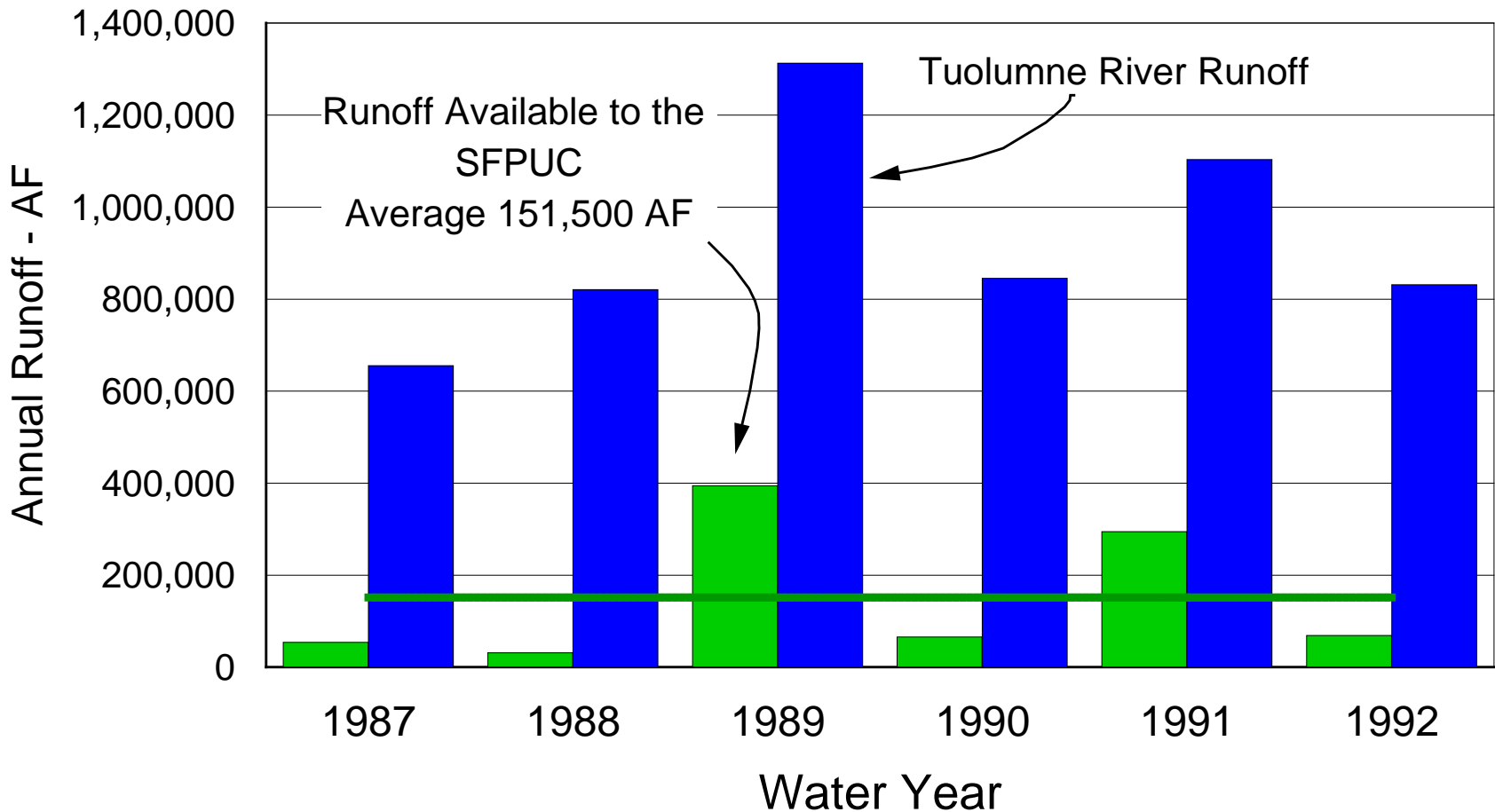
Hetch Hetchy Project Release Requirements for Downstream Water Rights

- Raker Act requires San Francisco to release water to meet prior water rights of MID and TID whenever such water can be beneficially used by the Districts
- San Francisco releases an additional 66 cfs to satisfy other prior downstream water rights that are now included in the Districts' water entitlements
- Districts' entitlement to their portion of natural daily flow under the Raker Act and the Fourth Agreement is measured at La Grange Dam
- Hetch Hetchy Project Release requirement is:
 - **2416 cfs or natural flow, whichever is less; or**
 - **4066 cfs or natural flow, whichever is less, for 60 days from April 15 to June 13**

Daily Allocation of Tuolumne River Runoff



Annual Tuolumne River Runoff Available to the SFPUC During the 1987 - 1992 Drought



Don Pedro Project

- San Francisco paid over half the construction cost for the Don Pedro Project
- Agreements between Modesto Irrigation District , Turlock Irrigation District, and San Francisco set the parties' rights and obligations for Don Pedro Project
- The Districts own and exercise exclusive control and use of all water released by San Francisco into Don Pedro Reservoir
- The Districts hold all water rights at Don Pedro Reservoir
- San Francisco holds no water rights at Don Pedro Reservoir

Don Pedro Water Bank

- Through the Fourth Agreement the parties established a Don Pedro water bank account into which San Francisco may “pre-release” water to meet the Districts’ water entitlements
- The water bank allows San Francisco to deliver water to its customers at a time when it might otherwise have to release water to meet the Districts’ water entitlements
- San Francisco may have a maximum water bank credit of up to 570 TAF at any time
- San Francisco has a right to an additional credit of 170 TAF, but only if and when Don Pedro Reservoir may encroach into flood storage
 - Infrequent, intermittent, and cannot be carried past October 6
- San Francisco may not have a negative water bank balance without Districts’ prior consent



Fourth Agreement Reservation Clause for Future FERC-ordered Fish Flow Requirements

- **Article 8:** The Districts and City recognize that Districts, as licensees under the [FERC] license for the New Don Pedro project, have certain responsibilities regarding the water release conditions contained in said license, and that such responsibilities may be changed pursuant to further proceedings before the [FERC]. As to these responsibilities, as they exist under the terms of the proposed license or as they may be changed pursuant to further proceedings before the [FERC], Districts and City agree:
- ... (b) **That at any time Districts demonstrate that their water entitlements, as they are presently recognized by the parties, are being adversely affected by making water releases that are made to comply with [FERC] license requirements, and that the [FERC] has not relieved them of such burdens, City and Districts agree that there will be a re-allocation of storage credits so as to apportion such burdens on the following basis: 51.7121% to City and 48.2879% to Districts.**



Statements in the SED about San Francisco and the Water Bank

- “San Francisco has the right to store 740 AFY in New Don Pedro Reservoir.” (p. 2-17)
- “Some portion of the increased release flows from New Don Pedro Reservoir could be shared by CCSF. This may require changing the water bank account but would not likely interfere with the CCSF diversions because its share of water rights is usually greater than the aqueduct diversions.” (pp. 5-88, 5-89, 5-90)
- “The water accounting for New Don Pedro Reservoir would likely be modified by the Lower San Joaquin River alternatives, but the upstream CCSF operations (storage, hydropower, and water diversion) are expected to be unchanged.” (p. 5-56)

The SED Is Inadequate

- The SED mischaracterizes and misstates how the Don Pedro Water Bank Account works
- The SED assumes that Don Pedro Water Bank accounting under the Fourth Agreement will need to be modified in order to implement the Lower San Joaquin River flow objectives, but fails to analyze the effects that reduced Hetch Hetchy Project water supplies will have in the San Francisco Bay Area except in a cursory fashion
- ***In presenting potential water supply and socioeconomic effects from certain interpretations of the Raker Act and the Fourth Agreement San Francisco does not thereby waive arguments it may have about how the Raker Act or Fourth Agreement should or will be interpreted in future proceedings.***

Water Supply Impacts

CCSF Water Supply Planning and Water Delivery Reliability

- Adopted levels of service
- Drought Planning Sequence
- Forecasting and operating procedures to provide assurance water deliveries could be sustained during drought

CCSF Water Supply

- Consists of runoff from its watersheds and other resources, reservoir storage is important
- CCSF supply from the Tuolumne River is limited by the Raker Act and Fourth Agreement
- The amount of runoff and storage available during drought is limited and is less than full delivery demands and storage objectives

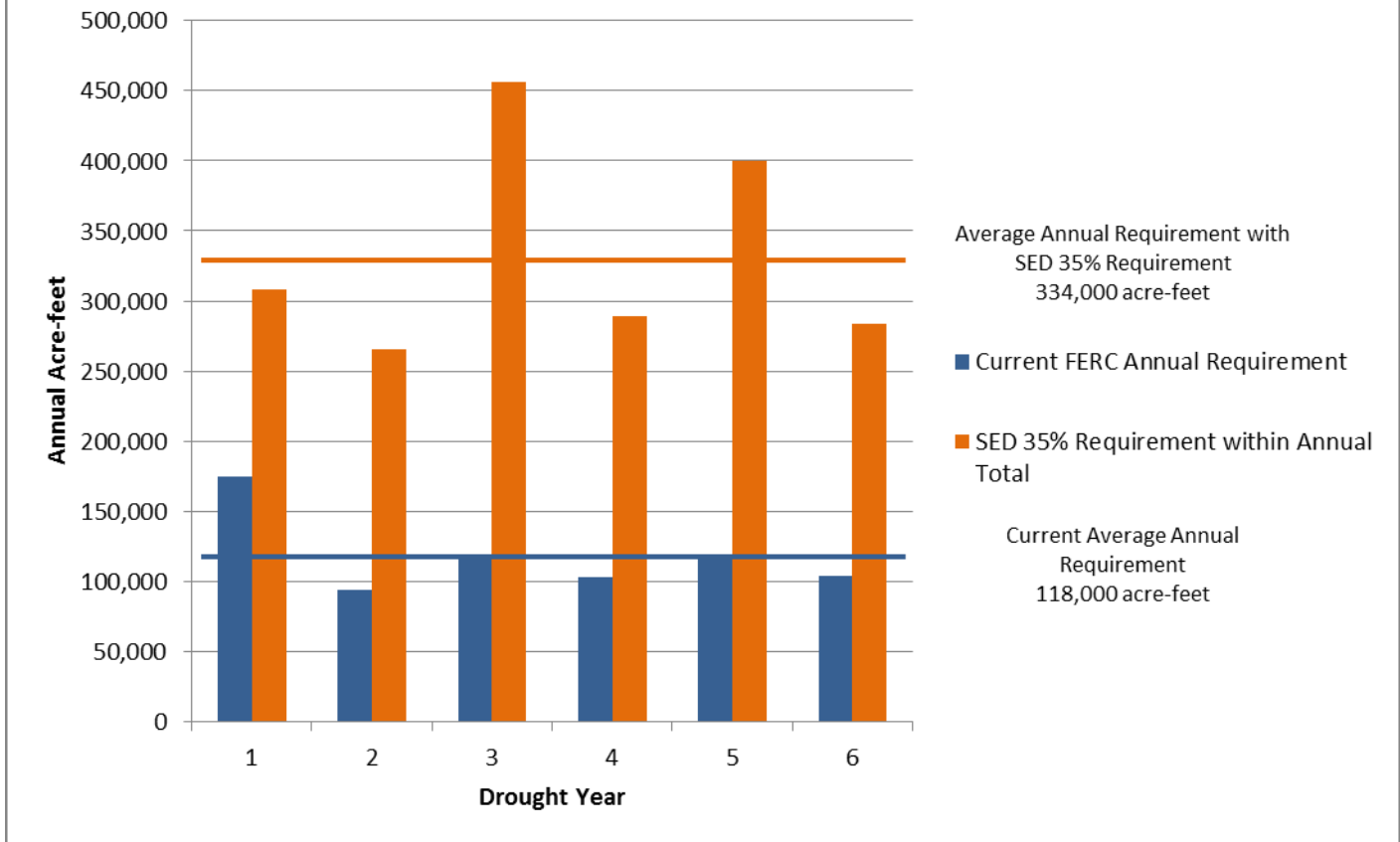
Projected CCSF Water Delivery Shortages with Current Demands

- Procedures establish the level of shortages needed to balance supplies with deliveries over the entire multi-year drought planning sequence
- There is no water left in the CCSF system at the end of the drought planning sequence
- At current demand, the recurrence of the 1987-1992 (6-year) drought leads to requiring 10 percent shortages in year 2, and for each year thereafter

Projected CCSF Water Delivery Shortages with SED 35% Flow Requirement

- The SED preferred alternative is assumed to be a flow requirement defined below La Grange Dam equal to the greater of existing FERC flow requirements or 35 percent of the Tuolumne River unimpaired flow during February through June
- The total incremental required release (above existing FERC requirements) below La Grange Dam is approximately 216,000 acre-feet per year which is the average over the Year 1 (1986) through Year 6 (1992) period
- The CCSF system is assumed to provide the Districts with approximately 52% of the incremental required release, 111,700 acre-feet per year
- CCSF distributes the incremental shortages across the entire Year 1 through Year 6 period at a constant rate

Required Lower Tuolumne River Flow



CCSF Water Deliveries and Shortages						
Projected Year	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Existing System Demand (MGD)	238	238	238	238	238	238
Existing System Shortage %	0	10	10	10	10	10
Existing System Delivery (MGD)	238	214	214	214	214	214
Existing System Delivery (Acre-feet/year)	266,600	239,700	239,700	239,700	239,700	239,700
Additional Reduction (Acre-feet)	111,700	111,700	111,700	111,700	111,700	111,700
Remaining Delivery (Acre-feet)	154,900	128,000	128,000	128,000	128,000	128,000
Remaining Delivery (MGD)	138	114	114	114	114	114
Remaining Delivery compared to Existing Demand (%)	58	48	48	48	48	48
Shortage after Additional Release (%)	42	52	52	52	52	52
<i>System reaction to annual reductions in water supply assumes the 6 years of annual impact are averaged over the entire 6 year period (111,700 acre-feet/year), and that deliveries will be reduced each year by the average annual impact.</i>						

**52% of the difference between current
FERC required flows and SED 35%
flows**

Socioeconomic Impacts of Rationing on the SFPUC Service Area

SFPUC's role as a provider of water

- The SFPUC Regional Water System provides retail water delivery to San Francisco and wholesale delivery to Alameda, San Mateo and Santa Clara Counties

CCSF:

- 147,000 residential accounts
- 21,600 non-residential accounts

27 wholesale agencies:

- 1.7 million people
- Over 30,000 C&I accounts

- Composition of demand on SFPUC supply:

60% residential

7% industrial

19% commercial

14% government and other

Importance to the Bay Area Economy

- SFPUC RWS is one of the largest centers of employment & economic activity in the U.S.
- Service area accounts for firms with:
 - Over 1.6 million jobs
 - Over \$280 billion in goods and services
- Due to the Bay Area's semi-arid climate, economic activity is dependent on imported water

- **Consumer surplus:** Difference between what a consumer is willing to pay and what is actually paid
- **Producer surplus:** Revenues in excess of levels adequate to keep producing goods or services
- **Economic responsiveness:** Job and sales response to water rationing

Economic Model

- **Comprehensive accounting.** Model all recipients of SFPUC RWS (CCSF, 24 cities & 2 private utilities)
- **Sectorial demands.** Model reflects demand in the residential, commercial, industrial and institutional sectors
- **Shortage allocation.** For each customer class, ration water across sectors to minimize losses

- Residential sector:
 - Accounts for 60% of water use in the SFPUC RWS.
 - Experiences the highest levels of rationing
- Estimate a detailed demand relationship for residential water use in the RWS
 - Models demand response to price, income, climate, residential density, and local demand factors

Summary of Welfare Impacts

Annual welfare losses under various shortage levels:

% Shortage	Loss	Potential Implication
10	\$53,000,000	Eliminate outdoor household water-use, and curtail indoor household water-use.
20	\$119,000,000	Daily showers and other basic household uses significantly reduced or eliminated.
41	\$324,000,000	Survival threatened in some locations; migration required. Significant cuts to C&I sector.
51	\$471,000,000	Human survival threshold surpassed without dramatic cuts in C&I sector.



Summary of Economic Impacts

Annual job & sales losses under various shortage levels:

% Shortage	Employment	Sales (billions)
10	3,922	\$1.8
20	6,562	\$3.1
41	139,146	\$37
51	188,000	\$49
