



City of Santa Barbara  
Public Works Department

## Memorandum

**DATE:** November 12, 2020

**TO:** Water Commission

**VIA:** Joshua Haggmark, Water Resources Manager

**FROM:** Dakota Corey, Water Supply Analyst

**SUBJECT:** Enhanced Urban Water Management Plan Work Session 1 of 2 –  
Future Portfolio Analysis

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### RECOMMENDATION

That Water Commission receive an update on the status of the Enhanced Urban Water Management planning effort and provide policy direction on the draft work products.

### DISCUSSION

The Enhanced Urban Water Management Plan (EUWMP) project commenced in March 2020 and is scheduled to be completed and submitted by the July 2021 State mandated deadline. Information on the EUWMP was presented to the Water Commission in April 2020, July 2020, and September 2020. In summary, the Water Commission has received information on the multifaceted stakeholder engagement process, water demand forecasting, and current water supply portfolio analysis. Initial results have showed that the City's current water supply portfolio is adequate under current supply and demand conditions. However, it also demonstrates that as demands are projected to increase over time, or if supplies diminish, the City will need additional supplies to meet water demands, particularly during periods of drought.

Staff will be facilitating the first of two work sessions to review and discuss the materials that have been developed as part of the EUWMP project with a deep dive into the first half of the future portfolio analysis. The second work session on November 19, 2020 will cover the Triple Bottom Line analysis, which considers social, environmental, and financial criteria for each portfolio. As with the past three Water Commission meetings on the EUWMP, staff are seeking comments and policy direction on the draft work products.

Staff plans to present to City Council on November 17, 2020 and December 8, 2020. The first meeting will include a presentation on the demand forecasting, which was presented to Water Commission in September 2020 and Planning Commission in October 2020.

The second meeting with City Council on December 8, 2020 will include the work we will be reviewing with the Water Commission in November and will seek additional policy direction on the draft work product. The Council agenda report will be a higher-level hybrid of these two November work sessions with the Water Commission, as well as information presented at the July 2020 Water Commission meeting. Therefore, the comments of the Water Commission will be important to the final product and the City Council discussion in December.

The EUWMP project team, which includes City staff and the firm Water Systems Consulting, Inc. (WSC), have made significant progress in developing and analyzing a collection of potential themed water supply portfolios that can meet the future water supply gaps identified in the existing portfolio analysis. The future portfolio analysis is the “heart” of the analytical work for the EUWMP. The analysis is detailed, multi-faceted, iterative, and provides many options for consideration.

### Future Portfolio Analysis

The future portfolio analysis evaluates a collection of themed portfolios through a multi-faceted, iterative approach. The Water Vision Santa Barbara (WVSB) Future Portfolio Analysis Technical Memorandum (TM) describes the analysis in detail. Several additional supporting TMs, listed below, have also been developed to describe the analyses performed on specific water supply options and planning considerations.

- WVSB Communications and Engagement Summary TM
- WVSB Demand Projections TM
- WVSB Water Supply and Climate Change Analysis for Lake Cachuma and Gibraltar Reservoir TM
- WVSB Groundwater Management Recommendations TM
- WVSB State Water Project Exchange and Storage Options TM
- WVSB Cost Basis TM

This collection of TMs is available for review on the City’s Water Vision Santa Barbara webpage: [www.SantaBarbaraCA.gov/WaterVision](http://www.SantaBarbaraCA.gov/WaterVision).

In response to the results of the existing portfolio analysis and feedback from Water Commission and the Water Vision stakeholder group, the following six themed portfolios were initially developed for analysis:

1. Existing Portfolio (Baseline Supplies)
2. Baseline Supplies Prioritized
  - Prioritization of desalination (desal) and SWP water over Cachuma water
3. Maximize Reliability
  - 2,900 acre-feet per year (AFY) of potable reuse
  - Enhanced State Water Project (SWP) reliability through groundwater banking
  - Prioritization of desal and SWP water over Cachuma water
4. Minimize Cost
  - Existing portfolio

- Higher water conservation program
- 5. Minimize Environmental Impacts
  - Minimize Cachuma water, SWP water, and desalination
  - 6,000 AFY potable reuse
  - Higher water conservation program
- 6. Maximize Local Control
  - No SWP water (sell all SWP water on spot market)
  - 5,000 AFY desal
  - 2,900 AFY potable reuse
  - Higher water conservation program

Three additional portfolios were defined based on an initial evaluation of the first six portfolios:

- 7. Potable Reuse
  - 2,900 AFY potable reuse
- 8. Desal Expansion
  - 5,000 AFY desal
- 9. Desal Expansion and Prioritization
  - Similar to “Desal Expansion,” but also prioritizes desal before Cachuma water

Additional details about each portfolio can be found in the WWSB Future Portfolio Analysis TM; projection assumptions for existing supplies are documented and potential new supplies – higher water conservation, desalination expansion, and potable reuse – are described and characterized. For example, the volume of potable reuse included in some of the portfolios, 2,900 AFY, was chosen to make potable reuse comparable to desalination expansion to 5,000 AFY. The current production capacity of the Charles E. Meyer Desalination Plant is 3,125 AFY. Expansion to 5,000 AFY would add an additional 1,875 AFY. For comparison, if potable reuse were implemented, a portion of the City’s current recycled water system production, 1,000 AFY, would be converted to potable distribution; therefore, a volume of 2,900 AFY (1,875 + 1,000 AFY) of potable reuse would be required to match desal expansion.

The Higher Conservation Program in the future portfolio analysis was designed to include additional water conservation above and beyond the water conservation program selected in the Water Conservation Strategic Plan, which was presented to Water Commission in September 2020. The Water Conservation Strategic Plan considered three different water conservation programs, Program A, B, and C, with Program A being similar to the City’s current water conservation program, Program B targeting additional conservation, and Program C targeting the most conservation, but analyzed to be less cost-effective than Program B.

The Water Conservation Strategic Plan ultimately recommended Program B, which has conservation measures that would yield an estimated 1,740 acre-feet (AF) of passive conservation savings (e.g., from plumbing code updates) by 2050 and 880 AF of active

conservation savings by 2050. To identify cost-effective conservation measures, Program B was evaluated based on the City's current annual avoided water supply cost, \$865/AF. The Higher Conservation Program analyzed for the future portfolio analysis has an avoided cost \$2,400/AF, which is triple that of Program B. However, the Higher Conservation Program requires annual conservation expenditures of \$2.4M, which is four times greater than costs for Program B. It is estimate that if the Higher Conservation Program was put into place by 2030, the City would reduce water demand by an additional 710 AFY on average over the 30-year planning period (2020 to 2050).

With both Program B and the Higher Conservation Program, the potential to reduce water demand is clear. However, the benefits of investing in conservation at costs that exceed the City's avoided water supply cost are potentially hard to justify, unless the conservation is offsetting higher cost supplies, such as desalination expansion or potable reuse. In addition, the Higher Conservation Program assumes City customers will participate in conservation programs at a high level with significant personal investment to drive down water demands. While City conservation staff think this level of implementation would be feasible with increased staffing, human behavior is notoriously hard to predict. Thus, the Higher Conservation Program would be a large investment for the City without guaranteed results.

#### Future Portfolio Simulations

Each portfolio was simulated over a 30-year projection period, 2020 to 2050, with the following assumptions:

- Hydrology: Applies historical hydrology from 1993 to 2019 plus 3 years of extended drought to create a 10 year design drought (2013-2022)
- Demand: Uses the baseline demand projection, as described in the WWSB Demand Projections TM, unless the Higher Conservation Program was included (Portfolios 4 (Min Costs), 5 (Min Environmental Impacts), and 6 (Max Local Control))
- Existing Supplies: Risk adjusted supply projections applied for existing supplies
- New Supplies: Desalination expansion or potable reuse added when demands reach 14,000 AFY
- Extraordinary Conservation: Used when needed to close the supply and demand gap in a given year

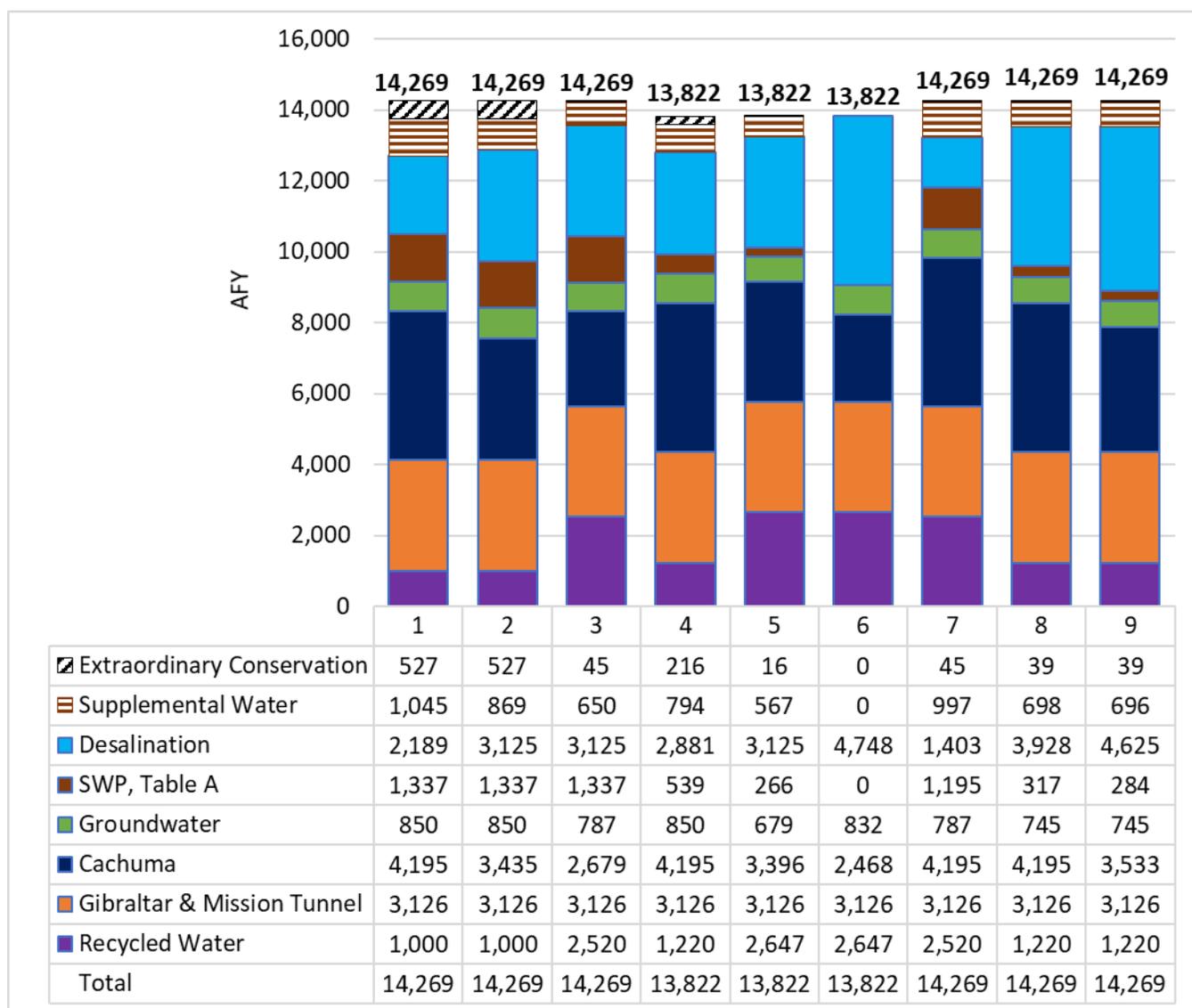
The risk adjusted supply projections were developed in the existing portfolio analysis and include:

- 80% of Mission Tunnel baseline (current) infiltration
- 60% of Gibraltar baseline (current) supplies
- 60% of Cachuma baseline (current) supplies
- 80% of in groundwater baseline (current) supplies
- A reduction in the average SWP allocation from 48% to 42%

The risk adjusted supply projections are described in greater detail in section 2.2.3 of the WWSB Future Supply Portfolio TM.

The use of each supply in each portfolio over the projection period (2020-2050) is summarized in Figure 1 below where the portfolio numbers can be found immediately under each bar in the chart and descriptions of each portfolio by number can be found in the figure heading.

Figure 1: Supply mix for each portfolio (1-9) over the time period 2020-2050. Portfolio descriptions: 1. Existing Portfolio (Baseline Supplies), 2. Baseline Supplies Prioritized, 3. Maximize Reliability, 4. Minimize Cost, 5. Minimize Environmental Impacts, 6. Maximize Local Control, 7. Potable Reuse, 8. Desal Expansion, 9. Desal Expansion and Prioritization.



The performance of each portfolio over the simulation period (2020-2050), including the number of years the portfolio experiences water shortages, the total volume of extraordinary conservation required, and comparative costs estimates, are summarized

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below in Table 1. Each metric is used to support the next step in the future portfolio evaluation – the Triple Bottom Line analysis.

*Table 1: Performance of each portfolio over the simulation period (2020-2050).*

	1	2	3	4	5	6	7	8	9
	Baseline	Baseline, Prioritized	Max Reliability	Min Costs	Min Env. Impacts	Max Local Control	Potable Reuse	Expand Desal	Expand & Prioritize Desal
<b>Number of Years in Each Water Storage Stage (2020-2050)</b>									
Stage 1 (≥85%)	3	3	1	5	--	--	1	1	1
Stage 2 (≥75%)	4	4	--	--	--	--	--	--	--
Stage 3 (≥50%)	--	--	--	--	--	--	--	--	--
<b>Extraordinary Conservation, Total Shortfall (2020-2050)</b>									
AF	15,810	15,810	1,360	6,480	--	--	1,360	1,170	1,170
<b>Comparative Cost Estimates, Cost (2020-2050)</b>									
Cost Above Baseline (\$M)	--	\$6 M	\$87 M	\$27 M	\$186 M	\$156 M	\$78 M	\$39 M	\$48 M
Unit Cost (\$/AF)	\$1,630	\$1,640	\$1,780	\$1,710	\$2,070	\$2,000	\$1,760	\$1,670	\$1,690

There are several takeaways as a result of the future portfolio simulation:

- Portfolio 1 (Baseline Supplies) and 2 (Baseline Supplies Prioritized) do not meet the level of service goal to provide at least 85% of total supply in all years. (Level of Service Goals are described in detail in section 3.1 of the WWSB Future Portfolio TM). As a result, these two portfolios are not analyzed further.
- Portfolio 4 (Minimize Cost) has the lowest unit cost, but also has the greatest amount of years with water shortages (5 years versus 1 year or no years) and requires the largest amount of extraordinary conservation (6,500 AF versus up to 1,400 AF). It is the only portfolio that meets level of service goals without investment in new water supply infrastructure. Demands are met by investing heavily in water conservation.
- Portfolio 5 (Minimize Environmental Impact) and Portfolio 6 (Maximize Local Control) have the highest cost due to local investments in potable reuse and desalination expansion, which allow the City to minimize SWP water and Cachuma water use. They are the only portfolios without water shortages in all simulated years.

The future portfolio simulations are only one step in the future portfolio analysis. The next steps in the analysis – the Triple Bottom Line and sensitivity analyses – will be described in the memo prepared for the November 19, 2020 Water Commission meeting.

## QUESTIONS FOR WATER COMMISSION

Chapter 5 of the Future Portfolio TM makes several near term recommendations, summarized below. Staff is looking for policy direction from the Water Commission on these recommendations.

- Demand/Conservation: Implement the recommended conservation program from the City's Water Conservation Strategic Plan (Program B), which estimates 1,740 AF of passive conservation (e.g., plumbing code) savings by 2050 and 880 AF of active conservation savings by 2050. In addition, monitor demand trends for indications of post-drought demand increases, or rebound, from existing customers.
- Cachuma Project: Preserve the ability to store carryover water and non-Project water in Lake Cachuma. The lake is the City's largest and closest year-over-year storage option, which allows the City to better manage the use of its other supplies, and prepare for a drought. The ability to store non-Project supplies, such as Gibraltar Reservoir pass-through water (see next item), SWP water, or other surface water conveyed to the lake, would provide the City additional operational flexibility and provide cost-effective reliability during drought conditions.
- Gibraltar Reservoir: Obtain a Warren Act contract from USBR to store Gibraltar water in Lake Cachuma to offset the supply impact of increased sedimentation in Gibraltar Reservoir as stipulated in the Upper Santa Ynez River Operations Agreement (Pass Through Agreement). The benefits are primarily in non-drought periods when Gibraltar is spilling. However this "pass through" allows the City to better manage the use of its other supplies and prepare for a drought.
- Groundwater: The City should work with the USGS to update the City's sustainable yield estimate and drought storage estimate for the Foothill Basin and Storage Unit 1. In addition, the City should prepare a short annual report that describes current basin conditions to inform annual water management planning. After preparing the first annual report, the City should consider whether to prepare a Groundwater Sustainability Plan (GSP) in compliance with the Sustainable Groundwater Management Act (SGMA) or an equivalent GSP that meets the City's needs, but is outside of SGMA compliance and reporting.
- State Water Project: SWP and supplemental water are essential during a drought, but the City's only existing option for storing SWP water is in San Luis Reservoir, which is not preferable for long-term storage since the water is lost when the reservoir experiences "paper" spills. In addition, the use of San Luis Reservoir for carryover storage will be severely limited if the Delta Conveyance Project is implemented. Finally, long-term reliability of SWP water continues to decline, especially in drought years. The City should work with CCWA to identify the City's preferred method for increasing certainty of SWP or supplemental water availability during extended drought conditions – whether via groundwater banking or long-term purchase agreements. This effort could also identify the potential to sell SWP water supplies on an annual basis when not needed for City use in that year or for future drought year supplies.

- Non-Potable Recycled Water: The City should update the recycled water market assessment documented in the 2009 Water Supply Planning Study and prepare updated cost estimates to expand the recycled water system. Up to 200 AFY of non-potable demand could potentially be served cost effectively, offsetting potable water demand, depending on the water market and cost updates.
- Potable Reuse: Once raw water augmentation regulations are issued by the State, the City should revisit the project definition assumptions from the 2017 Potable Reuse Feasibility Study and cost estimates documented in the Future Portfolios TM. Uncertainty in future regulations required multiple assumptions that must be revisited once regulations are in place. Then, the City can update its future supply comparison with desalination and the higher conservation program.

Staff is also asking Water Commission to voice any concerns they might have or holes they may have identified in the EUWMP analytical approach, including the supply and demand projections, the planning basis, and the existing portfolio analysis.

## **NEXT STEPS**

Work Session 2 will cover the Triple Bottom Line analysis, which considers social, environmental, and financial criteria for each portfolio. In addition, a recommended future portfolio will be presented and Water Commission will be asked to weigh in on several policy-related decisions, including the role of desalination in the City's water supply portfolio.