City of Santa Monica®

Information Item

Date: November 5, 2012

To: Mayor and City Council

From: Martin Pastucha, Director of Public Works

Subject: Sustainable Water Master Plan Status Update

Introduction

The development of a Sustainable Water Master Plan (SWMP) entails a multi-faceted approach to address the City's goal of achieving water self-sufficiency by the year 2020. With the City's current capability to meet 70% of its water demand from local groundwater sources, the objective is to develop strategies to close the "gap" represented by the current purchase of imported water. Through a combination of demand management approaches and water supply augmentation tactics, subjected to a life cycle cost assessment, various portfolios are being developed to represent permutations and combinations of options that best meet the program objectives and continue to support the City's Sustainability Plan. This report presents an update of the SWMP and the process and tools developed, including portfolio development, hydraulic model development, and the rate study update to allow the Council and the community to evaluate the mix of strategies to achieve water self-sufficiency by 2020. The study will be completed by June 2013.

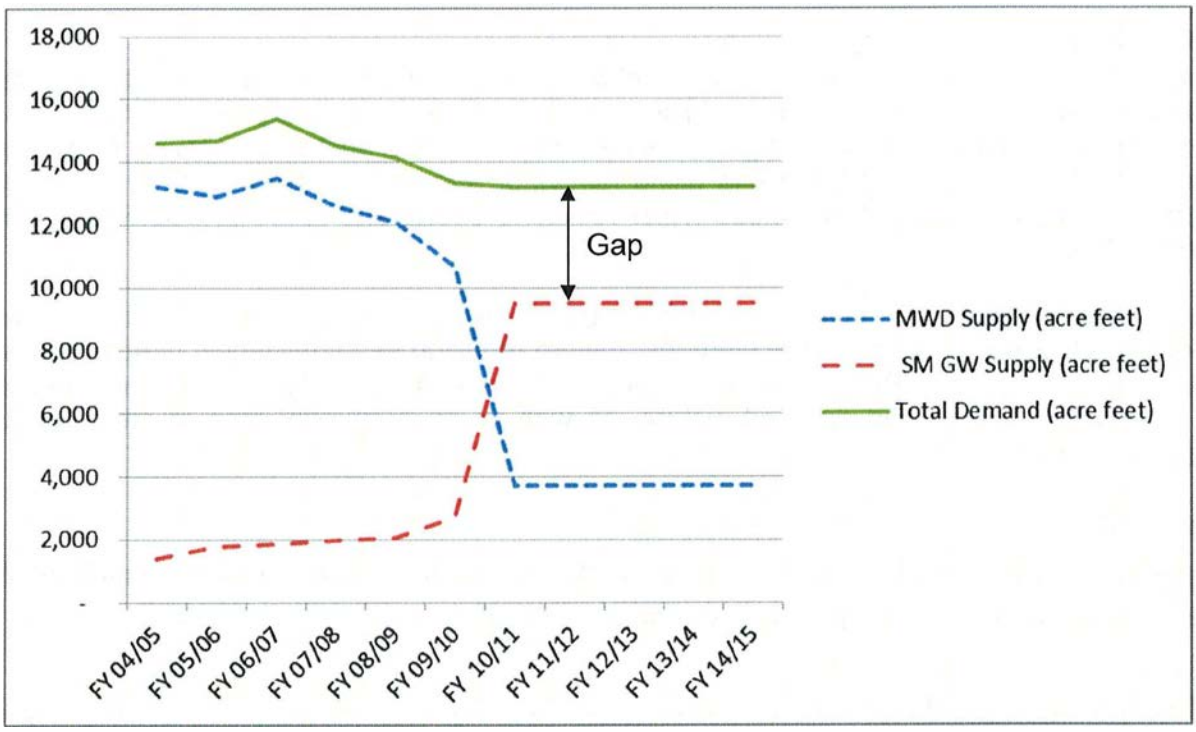
Background

In a study session at the March 8, 2011 Council meeting, staff presented the concepts and principles involved in achieving the goal of water self-sufficiency by the year 2020. Following the study session, staff embarked on the development of a Sustainable Water Master Plan (SWMP) in order to achieve this goal. In support of this effort an agreement with Richard C. Slade and Associates, LLC (RCS) to perform a groundwater assessment was authorized at the August 23, 2011 Council meeting, and another agreement with Kennedy/Jenks Consultants (KJC) was authorized at the March 27, 2012 Council meeting to prepare the Sustainable Water Master Plan. The SWMP is approximately 25% complete and progressing on multiple simultaneous tracks. This report presents an update to Council on the status of the work and the process developed to evaluate the options to achieve water self-sufficiency by 2020.

Discussion

Achieving water self-sufficiency in Santa Monica is a complex and ambitious goal with regional as well as local benefits. Presently, the City's water supply is a blend of locally pumped groundwater, and imported water from Northern California or the Colorado River purchased from the Metropolitan Water District (MWD). Every drop of imported water conserved by Santa Monica reduces the regional demand for imported water, which may be available for other uses within the State. In direct terms, achieving 100% water self-sufficiency means closing the gap that exists between total water demand and total water available locally. For example, projections for FY 2011/2012 indicated a total demand of 13,229 acre-feet. With a local groundwater production capability of 9,500 acre-feet per year, the difference of approximately 3,700 AF represents the gap to be eliminated in order to achieve 100% self-sufficiency, as illustrated below.

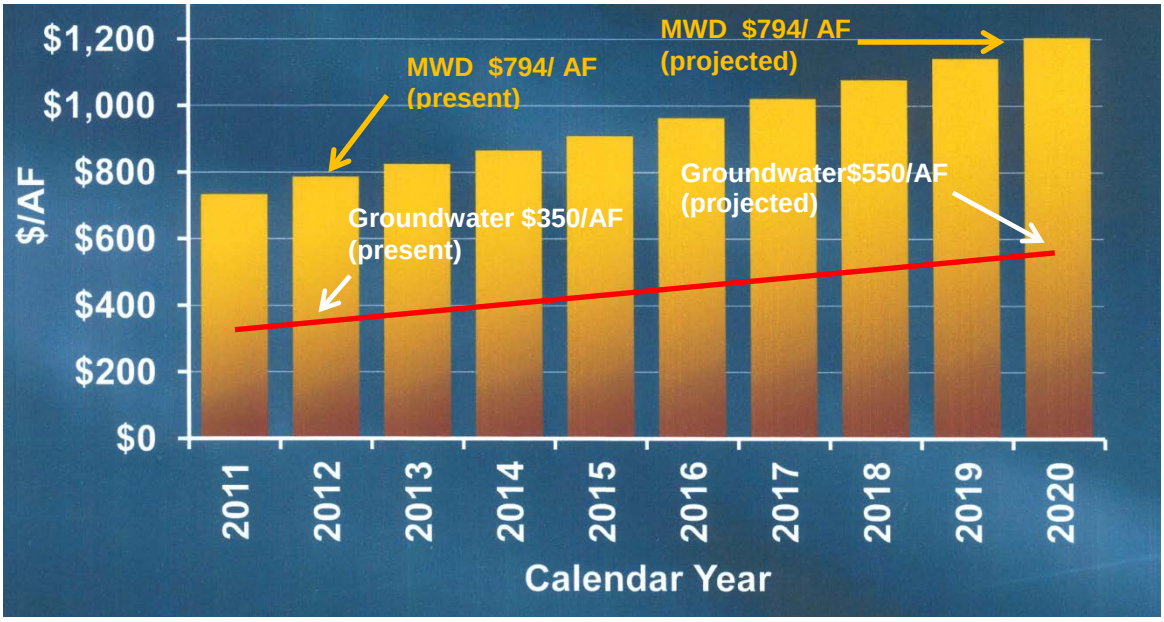
Santa Monica Projected Supply vs. Demand



Developing and implementing a SWMP will ensure that the City adequately manages its water supplies given that water resources are limited and imported water is becoming increasingly more expensive. Projections of imported water costs from MWD indicate

treated water costs, as illustrated below, will approach $1,200 per acre foot by the year 2020. Currently, the price paid by Santa Monica for MWD treated water is $794 per acre foot.

Cost of MWD Water and Local Groundwater



Source: Metropolitan Water District, 2011

The production of local groundwater in FY 2011/2012 cost the City approximately $350 per acre foot. If escalated at 6% annually, as the MWD projection above includes, the projected cost of local groundwater would be approximately $550/ acre foot in 2020 (see chart above).

Challenges have been noted by leading climate experts predicting that the Western United States will face extended periodic droughts over the next 30 years, and at other times severe storms will produce flooding. Significant challenges exist regarding the Sacramento-San Joaquin Delta water conveyance and delivery systems. Recently enacted State legislation, SBX7-7, requires each urban water retailer to reduce per capita water demand 20% by 2020, requiring residents and businesses to reduce current demand. All of these factors reinforce the value of the SWMP.

The challenge in pursuing self-sufficiency resides in creating a comprehensive approach not only in identifying the water resource portfolio required to close the gap, but also the financial, operational, and policy considerations required to do so. In addition to maximizing the use of groundwater resources at a sustainable level, achieving this goal will require increased water efficiency efforts and the use of various other non-potable water supply strategies (recycled water, greywater, rainwater, stormwater, etc.) to replace potable water use, primarily for outdoor uses. While these efforts will require substantial investments in the short-term, it is anticipated that they will result in long-term cost savings for all water users in the City as well as the security of a sustainable water supply as the City moves into an uncertain water availability future.

In the development of the SWMP, the following six strategies have been identified to close the existing 3,700 AF per year gap between total water demand and local groundwater production:

1. Decrease demand through the continued implementation of water efficiency programs designed to reduce potable water use.
2. Increase local water supplies through new water wells, rainwater harvesting, and opportunities for greywater uses, thereby reducing the use of imported water.
3. Develop a series of portfolios that integrate the options identified in the water supply and water demand strategies to ultimately meet the City's goal of water self-sufficiency by the year 2020. In the context of this discussion, the term "portfolio" means a combination of various supply and demand alternatives that will meet the City's self-sufficiency goals.
4. Develop a hydraulic model to assess the water distribution system performance, identify system deficiencies, and support the development of capital improvement needs.
5. Complete a five-year update of water and wastewater rates to assess impacts on rates and determine economic means to aid in self-sufficiency.
6. Develop a public outreach program to increase awareness of the City's water sustainability goals and promote support for the SWMP.

1. Decrease Demand

The City has been actively implementing water efficiency programs since 1988. In an effort to reach the City's goal to be water self-sufficient by 2020 and meet State water-efficiency requirements (namely SBX7-7), the City implements a variety of programs, policies and ordinances designed to increase water use efficiency throughout its service area. Over time the City has adapted its water use efficiency programs to meet changing customer needs, take advantage of identified opportunities (such as the availability of grant funding or MWD co-funding for a particular type of program) and promote advancements in devices and technologies that reduce water use.

Some of the City's current key water efficiency programs include:

- Regional Residential and Commercial Rebate Program, offered in partnership with MWD
- City of Santa Monica Landscape Rebate Program
- Bay Saver and Green Business Certification Water Assessments
- Parkway Policy (landscaping standards)
- Retrofit Upon Sale Ordinance
- Bay Saver Fee Ordinance
- Water Conservation Ordinance
- Green Building Ordinance
- Landscape Workshops
- School Education and Outreach, offered in partnership with MWD
- Ongoing Public Outreach Program

Moving forward, implementation of further water efficiency programs will assist the City in meeting both its water self-sufficiency goal as well as its State-mandated water use target. The mandate was established in the State Water Conservation Act of 2009, also referred to as SBX7-7. Analyses conducted using City billing data suggest that the current annual potable water use must be reduced by approximately 1,100 AF by the year 2020 in order to meet its SBX7-7 water use target of 123 gallons per capita per day (gpcd). It should be noted that per State

legislative requirements, the City can meet its SBX7-7 target through water efficiency programs, increased use of non-potable and recycled water, or a combination of the two. As such, both demand management and non-potable supply uses are being explored.

While the City has been successfully implementing water efficiency programs for the past couple of decades, some water savings opportunities still exist among certain customer sectors. Specifically, water use efficiency programs targeting the City's highest using commercial customers are anticipated to generate savings, as are programs designed to reduce outdoor water use and minimize system water losses. In addition, recent advancements in new technologies, including toilets with flush volumes of 0.8 gallons per flush (gpf), provide new opportunities for indoor water savings among residential customers – a customer sector otherwise thought to be largely efficient in their indoor water use. Programs and policies currently being explored for future implementation include:

- Direct installation of 0.8 gallon per flush toilets in multi-family residences
- Cooling tower retrofits for commercial customers, including hotels, groceries, and large institutional customers
- A targeted water reduction program for hospitals
- Automatic faucet shut off sensors for convalescent homes
- General water use reduction among school district accounts, both indoor and outdoor
- More efficient car washing options for automotive dealers
- Continuation of the City's current (newly updated) landscape incentive program
- Potential considerations for more effective water efficiency requirements within the City's Retrofit Upon Sale Ordinance
- Increase enforcement of the Water Conservation and Green Building Ordinances
- Increase marketing and outreach for water-efficiency programs
- Increase leak detection in the distribution system to minimize leaks

While water-efficiency programs will generate a reduction in water demand, it is not practical to eliminate the entire 3,700 AF annual “gap” through a decrease in demand.

2. Increase Local Water Supplies

As previously discussed, the City’s current water supply portfolio consists of two primary sources: local groundwater that requires local treatment and treated imported water from Metropolitan Water District (MWD). A small amount of additional supply is generated from the Santa Monica Urban Runoff Recycling Facility (SMURRF).

To meet the City’s sustainable goals and eliminate the continued use of imported water will require additional local water supplies. To this end, in conjunction with the SWMP, the City commissioned a groundwater study to construct a conceptual model and assess available groundwater supplies in the Santa Monica Basin. A summary of findings from this study (being prepared by Richard Slade & Associates) suggests:

- Groundwater contamination (volatile organic chemicals and various gasoline components) has occurred and has adversely impacted City wells in certain locations.
- Historical levels of groundwater pumping by the City and others have induced seawater intrusion into certain aquifers inland from the coastline.
- New wells in existing well fields should be avoided to prevent interference and reduced pumping capacity from existing wells.
- The opportunity for additional groundwater production from new wells located in the City limits has been identified in a preliminary review of available City-owned parcels, primarily in areas east of Lincoln Boulevard in order to avoid seawater intrusion. A few sites in the northern (Memorial Park, Douglas Park, and Stewart St. Park/City Maintenance Yard) and the southern (Clover Park, Virginia Avenue Park, and Santa Monica Airport) portions of the City were identified that may be appropriate for consideration for new wells.

An important finding in the groundwater assessment is a significant quantity of water has been identified in the Santa Monica Groundwater Basin. Most importantly, the annual withdrawal must be managed prudently to sustain the basin as a long-term, viable source of water. In addition, consideration must be given to the cost of extraction, the quality of water to be extracted, and the cost of treating this water to drinking level standards.

In addition to the assessment and integration of potential groundwater sources, the SWMP will include a feasibility assessment of harvesting local rooftop rainwater for onsite uses, and consider the issues and opportunities with using greywater and stormwater as an additional supply.

3. Develop Portfolios

As stated earlier, each portfolio is a combination of alternatives. The supply and demand management options identified will be used as building blocks to develop preliminary portfolios that have the potential to meet the long-range sustainable planning goals and objectives. These portfolios are being developed to represent selected themes which achieve the City's goals.

The following draft portfolio themes have been identified for future consideration as part of the SWMP process:

- Maximize Supply Options Theme: This portfolio theme will seek to meet all of the City's water demands by maximizing supply options with no increase in the current water-efficiency program (also called demand management).
- Maximize Demand Management Theme: This portfolio theme will focus on implementing aggressive demand management programs. While building the portfolio it will be assumed that a set percentage of the future demands are being met by water-efficiency programs.
- Maximize Sustainability Theme: This portfolio theme will consist of selecting supply and demand options from the prior two portfolios which promote environmental stewardship and sustainability, and achieved the best life cycle analysis score. These will have the least environmental impact by minimizing carbon footprint, greenhouse gases, ozone depletion, etc.

- Maximize Affordability Theme: This portfolio theme will consist of building a portfolio using low life-cycle cost supply/demand options. The main focus will be to choose least cost options. These options would also include maximizing potential outside funding opportunities etc.
- Maximize Diversity of Supply Theme: This portfolio theme will focus on diversifying the supply sources to help the City in the event that one of the supply sources is unavailable. By increasing the number of sources for the City, the reliance on one particular source is reduced. This portfolio theme will consist of utilizing a mix of supply sources to meet future demands.
- Hybrid Theme: The above portfolios should be considered as “bookends” for each theme. As such, hybrid portfolios will be developed that consist of various permutations and/or combinations of each. Since Hybrid Portfolios are typically established based on a blend of the best programs and activities, these portfolios are often the preferred choice in strategic integrated planning studies.

4. Develop a Hydraulic Model

Hydraulic distribution models are frequently used for the planning, design and operational management of water distribution systems. In order to evaluate the operating characteristics of a water distribution system, computerized modeling software provides a tool to identify potential system deficiencies, perform fire flow analysis, determine the appropriate size of future facilities, evaluate system performance, and provide risk management support.

The development of the hydraulic model is an important element of the SWMP as it is an integral component of evaluating system hydraulic reliability and providing additional information for asset management and critical decision making. The digital information necessary to develop, load, and calibrate the hydraulic model is readily available in the City’s GIS, billing system, and system operational data sets.

The calibrated model, in conjunction with digital coverage of the General Plan Land Use Element, vacant land, areas of redevelopment, and changing potable water use characteristics, provides the basis for spatially transforming today’s water system demands to a representative condition of system demands at future planning horizons. The model is then used to run current and future hydraulic

simulations, to identify system deficiencies for storage, fire flow, pumping, capacity, energy etc. and to develop necessary capital improvement projects. The hydraulic model development task is well underway at this time.

5. Water and Wastewater Rate Review

A rate study is included in the development of the SWMP. The study will include the rate impacts of potential capital projects and strategies identified in the final SWMP to achieve water self-sufficiency by 2020. These costs will be integrated into the five-year update of the current rate structure. In 2008, Santa Monica adopted a five-year plan for water and wastewater rates. The plan focused on assessing and recovering appropriate costs, provided for enhanced funding of dedicated reserves, and adopted a commodity-only rate structure to promote water efficiency and conservation. A commodity-only rate structure sends a very strong conservation signal: zero water use equates to zero water and wastewater charges to the customer.

6. Public Outreach

The SWMP incorporates a public outreach component to promote support for the SWMP. The public outreach program will communicate and educate residents and businesses about sustainability goals, the purpose and need for the SWMP, portfolio options and possible water rate adjustments.

A survey was conducted by the Office of Sustainability and the Environment in June/July 2012 to develop a tailored City-wide water-efficiency program and the public outreach component of the SWMP. Results indicate there is considerable outreach work needed to better educate and increase awareness regarding Santa Monica's water sources and water self-sufficiency goals, particularly groundwater sources and the City's goal to be water self-sufficient by 2020.

Outreach materials will be distributed through various means such as public meetings, the website, articles, and bill stuffers to improve public awareness of the City's goals and encourage water efficiency.

Next Steps

The development of the SWMP to achieve water self-sufficiency by 2020 requires a multi-faceted approach, and is scheduled to be completed by June 2013. Many of the components of the SWMP are currently in progress and nearing completion. The portfolio development discussed in this report is scheduled for completion in December 2012. A preliminary rate analysis will be completed in November/December 2012, and these two items will be the subject of a separate Council study session in the spring of 2013. Hydraulic model development will continue into January 2012. The nature and format of the public outreach element is in development, with the expectation that the public education and awareness program can be conducted in the spring of 2013.

On October 15, 2012, a summary of the status of the SWMP was presented to the City's Task Force on the Environment. Task Force members discussed the project, asked questions of staff, and encouraged staff to return at such time as additional information may be available.

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