



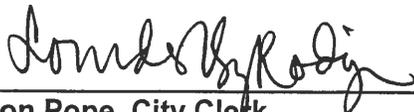
**Beverly Hills City Council Liaison / Public Works Commission Committee will conduct a Special Meeting, at the following time and place, and will address the agenda listed below:**

**CITY HALL  
455 North Rexford Drive  
4<sup>th</sup> Floor Conference Room A  
Beverly Hills, CA 90210**

**Thursday, April 27, 2017  
10:30 a.m.**

**AGENDA**

- 1) Public Comment
  - a. Members of the public will be given the opportunity to directly address the Committee on any item listed on the agenda.
- 2) Update on Santa Monica Groundwater Sustainability Agency
- 3) Well Water Analyses and Recommendations
- 4) Interim Irrigation of Sunset and Burton Medians
- 5) Adjournment

*for*   
\_\_\_\_\_  
Byron Pope, City Clerk

**Posted: April 25, 2017**



In accordance with the Americans with Disabilities Act, if you need special assistance to participate in this meeting, please call the City Manager's Office at (310) 285-1014. Please notify the City Manager's Office at least forty-eight hours prior to the meeting so that reasonable arrangements can be made to ensure accessibility.



## CITY OF BEVERLY HILLS

### PUBLIC WORKS SERVICES

#### MEMORANDUM

**TO:** Vice Mayor Julian A. Gold, M.D. and Councilmember Robert Wunderlich

**FROM:** Vince Damasse, Water Resources Manager  
Trish Rhay, Assistant Director of Public Works Services, Infrastructure & Field Operations

**DATE:** April 27, 2017

**SUBJECT:** Update on Santa Monica Basin Groundwater Sustainability Agency

**ATTACHMENTS:** Memorandum of Understanding for Santa Monica Basin Groundwater Sustainability Agency

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This report summarizes the background and efforts leading to the development of a Memorandum of Understanding (MOU) for the Santa Monica Basin Groundwater Sustainability Agency between the City of Santa Monica as the lead agency and various stakeholders including the City of Beverly Hills.

#### **BACKGROUND**

The Sustainable Groundwater Management Act (SGMA) empowers local agencies to adopt groundwater management plans that are tailored to the resources and needs of their communities. Prudent groundwater management will provide protection against drought and climate change, and contribute to more robust and reliable water supplies regardless of weather patterns. Currently, the City of Beverly Hills does not pump groundwater out of the Santa Monica Basin, however, the City is contemplating pumping out of the adjacent unadjudicated Central Basin. By being an active stakeholder in the MOU to form the Santa Monica Groundwater Sustainability Agency, the City can protect its interests in the Santa Monica Basin in the future should it decide to extract additional groundwater supplies from the Santa Monica Basin as an additional source of supply.

On September 16, 2014, Governor Brown signed a package of three bills to advance sustainable groundwater management in California. The legislation, known as the Sustainable Groundwater Management Act (SGMA), provides a framework for improved management of groundwater by local authorities. The bills are SB 1168 (Pavley), SB 1319 (Pavley), and AB 1739 (Dickinson), respectively.

The legislation provides local agencies with the tools to manage groundwater basins in a sustainable manner over the long-term and enables limited state intervention when necessary to protect groundwater resources. SGMA establishes a definition of sustainable groundwater management, requires that local agencies develop groundwater management plans and

implement strategies to sustainably manage groundwater resources, prioritizes basins with the greatest need (ranked as high and medium priority), and sets a timeline for implementation as follows:

- June 30, 2017: Local Groundwater Sustainability Agencies (GSA) must be formed.
- January 31, 2020: Groundwater Sustainability Plans (GSP) must be completed for basins in a critical condition of overdraft.
- January 31, 2022: GSPs must be completed in all other high- and medium-priority basins not currently in overdraft, including the Santa Monica Groundwater Basin.
- Twenty years after adoption of the GSP (2040 and 2042): All high- and medium-priority groundwater basins must achieve sustainability.

The Santa Monica basin is categorized as a medium-priority basin. Basin Prioritization is a statewide ranking of groundwater basin importance that incorporates a scoring criteria for each basin utilizing eight specific criteria: overlying population, projected growth of overlying population, public supply wells, total number of wells, irrigated acreage overlying the basin, reliance on groundwater as the primary source of water, impacts on the groundwater, and other information deemed relevant by the California Department of Water Resources (DWR).

## **DISCUSSION**

### **Groundwater Sustainability Agency Formation:**

SGMA promotes coordinated management of an entire groundwater basin. Any local agency or combination of local agencies overlying a groundwater basin may form a groundwater sustainability agency (GSA) for the basin. A combination of local agencies may form a GSA by joint powers agreement or memorandum of understanding or other legal agreement. Local agencies are given until June 30, 2017 to form a GSA. The GSA applicant must notify the California Department of Water Resources (DWR) of the formation or establishment of a GSA within 30 days of final formation, and 90 days later the applicant shall be the exclusive GSA as long as no other local agency submits a notification of its intent to undertake groundwater management in all or a portion of the same area. If an area over a basin is not within the management area of a GSA, the local county will be presumed to be the GSA for the area unless it opts out. The county shall notify DWR whether it will or will not be the GSA for the area.

A GSA must consider the interests of a variety of different stakeholders, including beneficial users of water, environmental interests, disadvantaged communities, tribes, and others. The agency must maintain a list of persons interested in receiving notices regarding plan preparation and other activities.

SGMA provides GSAs with a broad array of duties, responsibilities, and authorities. For example, it provides local GSAs with the authority to conduct investigations, determine the sustainable yield of a groundwater basin, measure and limit extractions, impose fees for groundwater management, and enforce the terms of a Groundwater Sustainability Plan (GSP).

SGMA however does not authorize a local agency to make a binding determination of the water rights of any person or entity. In addition, SGMA states that a GSP supersedes the land use authority of cities and counties.

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SGMA also includes provisions to promote engagement by interested parties in the formation of a GSA and development and implementation of a GSP. GSAs must identify key parties and maintain records that delineate how their interests will be included in GSA operations and GSP development. SGMA requires the GSA to provide this information to the California Department of Water Resources. The GSA is the primary agency responsible for achieving sustainability within the mandated timeframe.

#### Groundwater Sustainability Plans:

A key element of the legislation is the requirement that GSAs develop GSPs. Due to wide diversity of conditions in groundwater basins throughout the state, the legislation provides options for development of plans, and avoids a "one size fits all" approach. Each basin is to be covered by a single GSP developed by one or more agencies, or by multiple GSPs implemented by multiple GSAs and coordinated by a single coordination agreement that covers the entire basin. The development and adoption of a GSP is exempt from the requirements of the California Environmental Quality Act (CEQA). The legislation requires that GSPs include "measurable objectives, as well as interim milestones in increments of five years, to achieve the sustainability goal in the basin within 20 years of the implementation of the plan." GSPs must include a physical description of the basin, including groundwater levels, groundwater quality, subsidence monitoring, information on groundwater-surface water interaction, data on historical and projected water demands and supplies, monitoring and management provisions, and a description of how the plan will affect other plans, including city and county general plans.

#### City of Beverly Hills GSA Involvement:

The 50-square mile Santa Monica Basin underlies Santa Monica and portions of Los Angeles (including a small portion overlying the City of Beverly Hills boundaries). In preparation for submitting GSA formation documents to the state Department of Water Resources by the June 30, 2017 deadline, City staff is collaborating with other agencies overlying the Santa Monica Basin, including the City of Santa Monica, Los Angeles Department of Water and Power, Culver City, and the Los Angeles County Department of Public Works (collectively, "the Parties") to develop a Memorandum of Understanding (MOU) for the creation of the Santa Monica Basin GSA.

As part of on-going MOU negotiations, the negotiating legal representatives of the Parties have indicated by consensus to have the City of Santa Monica serve as the point of contact on behalf of the Santa Monica Basin GSA as well as the lead in undertaking other obligations of the GSA. Santa Monica is the likely appropriate lead agency for the GSA as the predominant groundwater pumper in the basin over the last 20-30 years. As the coordinating agency, Santa Monica would serve as the primary point of contact with the State on behalf of the Parties, prepare and file annual reports as required by SGMA, administer service contracts, and coordinate the administrative functions of the GSA with the Parties.

Legal counsels from the Parties are also considering a unified GSP for the Santa Monica Basin. The assignment of SGMA implementation duties (including data and cost sharing obligations) may be negotiated as part of either the MOU or the GSP. To date, the interested Parties, individually and collectively, including cost sharing, have yet to be fully negotiated in the MOU so final decisions on these issues may be deferred until the GSP development process in order to expedite formation of the GSA. The City of Beverly Hills' costs to form a GSA via MOU to date have been primarily staff and legal administrative costs at this time. However in the near future once the cost allocation structure is negotiated and better known, the City could at any

time exercise its option to opt out of the MOU. Future anticipated costs to be incurred by the interested Parties include procurement of a consultant to prepare a Groundwater Sustainability Plan (GSP). The GSP would have to be developed and adopted by January 31, 2022. Other future costs could include water quality monitoring, capital projects, and periodic reporting and other administrative costs.

A public information and outreach meeting was conducted by the City of Santa Monica with the interested Parties in attendance on April 12, 2017 at the Windward School in Mar Vista to provide stakeholders and the public an opportunity to become informed about SGMA requirements and status of local GSA formation efforts.

The next steps include public hearings to adopt the MOU and form the GSA by each of the respective Parties. The City of Beverly Hills public hearing is scheduled for May 16, 2017 with the remaining Parties' public hearings also scheduled in May/June 2017. This will be followed by submission of the GSA documentation to the State Department of Water Resources by end of June 2017, and completion and adoption of the GSP five years following the formation of the GSA by January 2022.

Staff will be present at the Public Works Liaison Committee and will be available to answer any questions during the meeting.

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Memorandum of Understanding (MOU)  
Santa Monica Basin Groundwater Sustainability Agency

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**Memorandum of Understanding for the Formation of the  
Santa Monica Basin Groundwater Sustainability Agency**

This Memorandum of Understanding for the formation of the Santa Monica Basin Groundwater Sustainability Agency (MOU) is made and entered by and among the City of Santa Monica (Santa Monica), a municipal corporation, the City of Los Angeles, by and through its Department of Water and Power (LADWP), the City of Beverly Hills (Beverly Hills), the City of Culver City (Culver City), and the County of Los Angeles (County), each a "Party" and, collectively, the "Parties."

**WHEREAS**, the Sustainable Groundwater Management Act (SGMA), as enacted on September 16, 2014, and codified in California Water Code Section 10720 et seq., is intended to enhance local and sustainable management of groundwater; and

**WHEREAS**, SGMA authorizes local public agencies that have water supply, water management, or land use responsibilities within a groundwater basin to form a Groundwater Sustainability Agency (GSA) to implement SGMA's provisions within that basin; and

**WHEREAS**, each Party is a local public agency that has water supply, water management, or land use responsibilities within the Santa Monica Basin (Basin Number 4-11.01 DWR Bulletin 118) (Santa Monica Basin); and

**WHEREAS**, the Parties desire to collectively manage the Santa Monica Basin within their jurisdictional boundaries; and

**WHEREAS**, the Parties intend to work collaboratively with each other and other interested parties to develop and implement a single Groundwater Sustainability Plan (GSP) to sustainably and cost-effectively manage groundwater in the Santa Monica Basin pursuant to the requirements of SGMA.

**NOW, THEREFORE**, incorporating the above recitals herein and exhibit attached, it is mutually understood and agreed by the Parties as follows:

1. **PURPOSE.** This MOU is entered into by and among the Parties to facilitate a cooperative and ongoing working relationship to comply with SGMA in the Santa Monica Basin by, among other things, forming a GSA and developing and implementing a single GSP. This MOU is not intended to form a new legal entity.
2. **SANTA MONICA BASIN GROUNDWATER SUSTAINABILITY AGENCY**
  - 2.1 The Parties hereby establish the Santa Monica Basin Groundwater Sustainability Agency (SMBGSA) to sustainably and cost-effectively manage groundwater in the Santa Monica Basin.

- 2.2 The SMBGSA shall only operate within the collective jurisdictions of the Parties within the boundaries of Santa Monica Basin, as depicted on the map incorporated herein as Exhibit "A."
- 2.3 The SMBGSA shall be governed in accordance with this MOU and any bylaws hereinafter adopted by the Parties. If any conflict arises between this MOU and the bylaws, the terms of this MOU shall govern

### **3 ROLES AND RESPONSIBILITIES OF THE PARTIES**

- 3.1 Each Party covenants that it has the authority to perform the activities required to accomplish the purposes of this MOU, and will cooperate to implement the following activities and other activities consistent with SGMA in the Santa Monica Basin:
  - a. Preparing and maintaining a list of interested parties.
  - b. Conducting public outreach and engagement.
  - c. Submitting notification of the formation of the SMBGSA to the California Department of Water Resources (DWR).
  - d. Consulting and contracting with the United States, State of California, and adjacent water agencies and individual landowners.
  - e. Entering into coordination agreements with other GSAs and watermasters.
  - f. Conducting investigations and analyzing data.
  - g. Developing, adopting, and implementing a GSP.
  - h. Approving and collecting groundwater management fees.
  - i. Pursuing financial assistance through grants or similar opportunities.
  - j. Obtaining third-party services for groundwater modeling, data collection, reports, and other related tasks.
- 3.2 Santa Monica shall serve as the coordinating agency on behalf of the SMBGSA to provide a single point of contact with DWR.

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- 3.3 Santa Monica shall assume primary responsibility for coordinating the administrative functions of the SMBGSA, subject to the terms of this MOU and the unanimous consent of the Parties.

#### **4 MEETINGS AND DECISION MAKING PROCESS**

- 4.1 Each Party shall appoint one representative (Party Representative) to participate in the SMBGSA on its behalf. Each Party may appoint an alternate representative (Alternate Representative) in case of the Party Representative's absence or inability to act. A Party may replace its Party Representative or Alternate Representative at any time upon providing notice to the other Parties.
- 4.2 The Party Representatives shall meet as necessary to fulfill the obligations under this MOU and SGMA, including but not limited to considering the interests of groundwater beneficial users located in the Santa Monica Basin pursuant to California Water Code Section 10723.2. Meetings shall be conducted in accordance with SGMA and any bylaws hereinafter adopted by the Parties.
- 4.3 All actions undertaken by the SMBGSA shall be by unanimous consent of the Parties. The Parties understand and agree that such consent may require further action by the Parties' respective governing bodies.
5. **FUNDING.** Each Party shall bear its own costs until the SMBGSA becomes the exclusive GSA in the Parties' collective jurisdictions pursuant to California Water Code Section 10723.8. No further costs will be undertaken by or allocated to any of the Parties until a principle for cost distribution is agreed upon and reflected in an amendment to this MOU, bylaws, or another binding document.
6. **TERM.** This MOU shall become effective upon each Party's execution and shall terminate on January 31, 2042. The Parties may terminate this MOU sooner by unanimous written consent.
7. **WITHDRAWAL.** Any Party may unilaterally withdraw from this MOU without causing or requiring termination of the MOU upon providing 30 days prior written notice to the other Parties. Any withdrawing Party shall pay its share of any expenses incurred or accrued in accordance with section 5 of this MOU up to the date of withdrawal. The non-withdrawing Parties may elect to continue implementation of SGMA jointly under this MOU for the governance of the lands lying within the jurisdiction of the non-withdrawing Parties.

- 8. AMENDMENTS AND WAIVER.** No amendment or waiver of any provision of this MOU, nor consent to any departure, shall be effective unless in writing and signed by each Party, and then such waiver or consent shall be effective only in the specific instances and for the specific purpose given.
- 9. NO LIABILITY.** No Party, nor any board, director, officer, or representative of a Party, shall be responsible for any damage or liability occurring by reason of any other Party's performance or non-performance of its obligations under this MOU.
- 10. NOTICES.** All notices and other communications given under the terms of this MOU must be in writing and served personally or by certified U.S. mail. Any such notice shall be addressed to the Parties as set forth as follows or to such other address as the Parties may hereafter designate by written notice. The date of receipt of the notice shall be the date of actual personal service or three days after the postmark on certified mail.

Santa Monica

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Water Resources Manager  
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County

County of Los Angeles  
Mitch Glaser, Assistant Administrator  
320 West Temple Street  
Los Angeles, CA 90012  
Phone: (213) 974-4971  
Fax: (213) 626-0434

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- 11. WATER RIGHTS.** Nothing herein shall be construed or interpreted as authorizing the SMBGSA to make a binding determination regarding the water rights of any person or entity, including, without limitation, any Party.
- 12. LAND USE AUTHORITY.** Nothing herein shall be interpreted as superseding the land use authority of cities and counties, including the city or county general plans, within the Santa Monica Basin.
- 13. RELATIONSHIP OF PARTIES.** The Parties shall remain at all times as to each other, wholly independent entities. No Party shall have the authority to incur any debt, obligation, or liability on behalf of another Party unless expressly provided by written agreement of the Parties. No employee, agent, or officer of a Party shall be deemed for any purpose whatsoever to be an agent, employee or officer of another Party.
- 14. GOVERNING LAW.** This MOU shall be interpreted, construed, and governed according to the laws of the State of California without regard to conflict of law principles.
- 15. VENUE.** Any suit, action, or proceeding brought under the scope of this MOU shall be filed in the County of Los Angeles, State of California. The foregoing, however, shall not limit any Party's right to seek a change of venue under applicable law.
- 16. NO ATTORNEYS' FEES.** The Parties agree that, in any action to enforce the terms of this MOU, each Party shall bear its own attorneys' fees and costs.
- 17. JOINTLY DRAFTED.** Each Party acknowledges that it was represented by its legal counsel during the negotiation and execution of this MOU, and that it has had a full and fair opportunity to review and revise the terms of this MOU. Each Party further agrees that this MOU has been jointly drafted, and that no term contained herein shall be construed against or in favor of another Party.
- 18. SEVERABILITY.** If one or more of the provisions contained in this MOU are invalid, illegal, or unenforceable in any respect, the validity, legality, and enforceability of the remaining provisions shall not be affected or impaired in any manner.
- 19. HEADINGS.** Section headings in this MOU are included for convenience of reference only and shall not be given any substantive effect.

**20. ENTIRE AGREEMENT.** This MOU constitutes the entire understanding of the Parties with respect to the subject matter hereof and supersedes all prior or contemporaneous agreements, whether written or oral, with respect thereto.

**21. COUNTERPART EXECUTION.** This Agreement may be executed in counterparts and each executed counterpart shall be effective as the original.

**22. NO THIRD PARTY BENEFICIARIES.** This MOU is not intended, and will not be construed, to confer a benefit or create any right on a third party or the power or right to bring an action to enforce any of its terms.

[signature pages follow]

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**IN WITNESS WHEREOF**, each Party hereby has caused this MOU to be executed as of the date and year written below:

DEPARTMENT OF WATER AND POWER  
OF THE CITY OF LOS ANGELES BY  
BOARD OF WATER AND POWER COMMISSIONERS

By: \_\_\_\_\_  
DAVID H. WRIGHT  
General Manager

Date: \_\_\_\_\_

And: \_\_\_\_\_  
BARBARA E. MOSCHOS  
Secretary

**IN WITNESS WHEREOF**, each Party hereby has caused this MOU to be executed as of the date and year written below:

ATTEST:

\_\_\_\_\_  
DENISE ANDERSON-WARREN  
City Clerk

CITY OF SANTA MONICA  
a municipal corporation

By: \_\_\_\_\_  
RICK COLE  
City Manager

APPROVED AS TO FORM:

\_\_\_\_\_  
JOSEPH LAWRENCE  
Interim City Attorney

---

**IN WITNESS WHEREOF**, each Party hereby has caused this MOU to be executed as of the date and year written below:

CITY OF BEVERLY HILLS

By: \_\_\_\_\_  
SHANA EPSTEIN  
Public Works Director

APPROVED AS TO FORM:

\_\_\_\_\_  
JIM MARKMAN  
City Attorney

**IN WITNESS WHEREOF**, each Party hereby has caused this MOU to be executed as of the date and year written below:

CITY OF CULVER CITY

ATTEST:

\_\_\_\_\_  
JEREMY GREEN  
City Clerk

By: \_\_\_\_\_  
JOHN M. NACHBAR  
City Manager

APPROVED AS TO FORM:

\_\_\_\_\_  
CAROL SCHWAB  
City Attorney

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**IN WITNESS WHEREOF**, each Party hereby has caused this MOU to be executed as of the date and year written below:

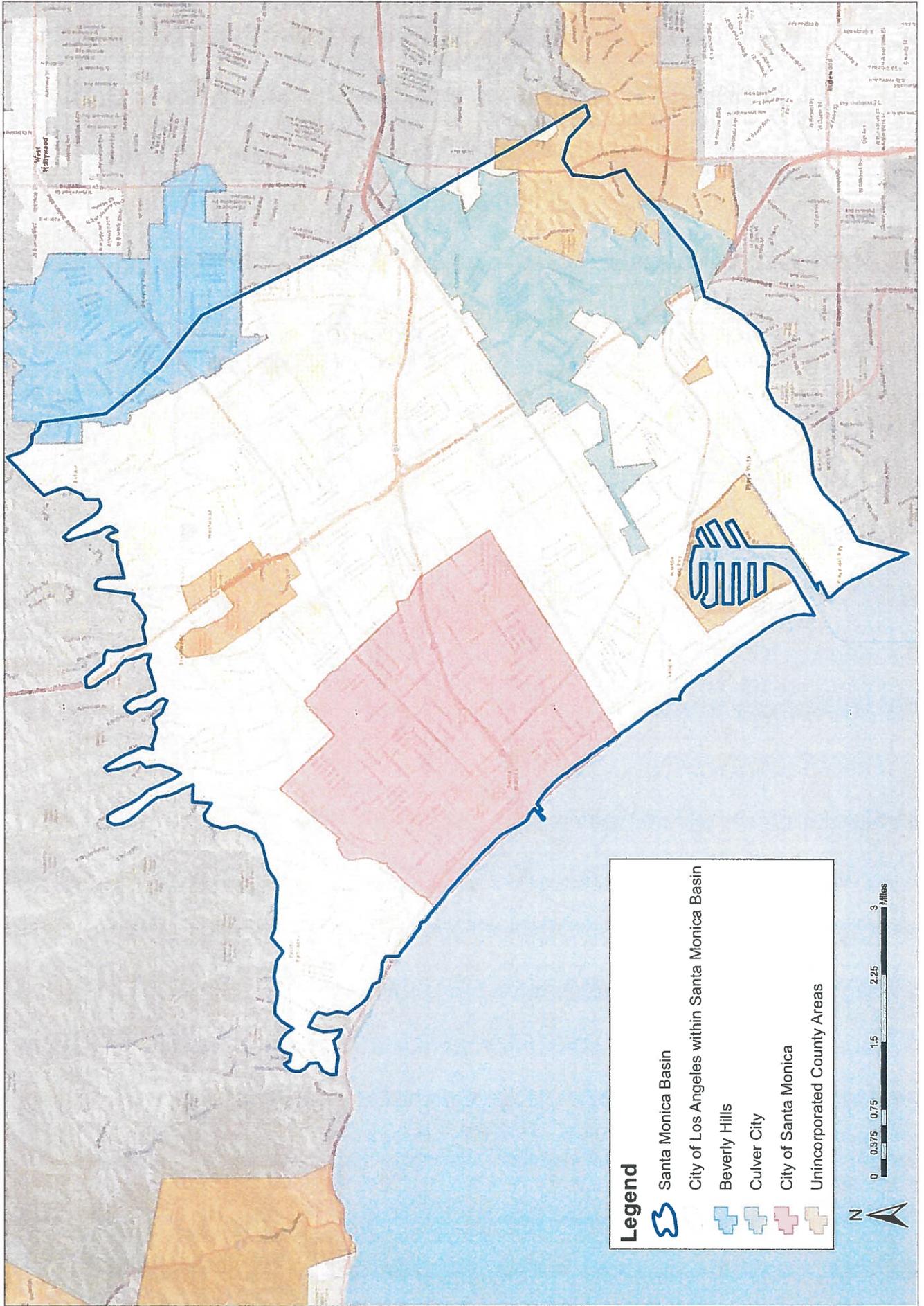
COUNTY OF LOS ANGELES

APPROVED AS TO FORM:

\_\_\_\_\_  
MARY C. WICKHAM  
County Counsel

By: \_\_\_\_\_  
RICHARD J. BRUCKNER  
Director of Regional Planning

# Exhibit A: Santa Monica Basin





**CITY OF BEVERLY HILLS**

**PUBLIC WORKS SERVICES**

**MEMORANDUM**

**TO:** Vice Mayor Julian A. Gold, M.D. and Councilmember Robert Wunderlich

**FROM:** Vince Damasse, Water Resources Manager  
Trish Rhay, Assistant Director of Public Works Services, Infrastructure & Field Operations

**DATE:** April 27, 2017

**SUBJECT:** Well Water Quality Analyses and Recommendations

**ATTACHMENTS:** Hazen & Sawyer Report – Well Water Quality at the Treatment Plant

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This report summarizes the results of the existing Hollywood wells well water quality analyses. Staff is also seeking the City Council Liaison Committee's input and direction regarding staff's recommendations on the next steps for resolving these well water quality issues.

**BACKGROUND**

The Water Treatment Plant (WTP) was taken offline in 2015 to complete a rehabilitation of the plant. The rehabilitation effort was limited in scope to various maintenance upgrades to improve plant operability including reconstruction / routing of the industrial waste line, corrosion repairs and coatings for the plant piping, pipe supports, valves, and clear well, chemical pump skid upgrades, control panel and associated Supervisory Control and Data Acquisition (SCADA) upgrades. The rehabilitation effort only addressed these limited maintenance issues. At the time of the plant rehabilitation shutdown, the water quality in the Hollywood basin wells, was at a stable, historically predictable standard and did not signal any need for treatment plant improvement or re-design. Staff substantially completed the rehabilitation of the WTP in October/November 2016. Since October 2016, Hazen & Sawyer (H&S) and staff have embarked on dry and wet commissioning of the WTP.

Before the plant was shut down for the rehabilitation project, the wells had historical water quality issues with well sanding, dissolved iron, manganese, Total Dissolved Solids (TDS), and sulfur in well groundwater. All of these issues had been consistently in a range that the existing treatment processes were able to manage. When the WTP was shut down in 2015 for the rehabilitation project, the water quality concentrations were much different than staff experienced during the wet commissioning period.

**Sanding**

Staff did not experience sanding like what was experienced previously. Historically, sanding was experienced in the wells but to a much lesser degree. Also, the sand historically was removed successfully with the existing cartridge filters ahead of the Reverse Osmosis (RO)

train. Contrast this with the higher volume and much finer sanding experienced during the wet commissioning process. During the ensuing well water quality testing, the fine sands would pass through both the existing and newly installed cartridge filter vessel leading to the inlet of the RO train. Although sanding is not a regulated Department of Drinking Water constituent, if left untreated, it can cause over time plugging of the RO membranes leading to increased O&M and wear down mechanical equipment and instrumentation due to plugging and abrasion.

### Manganese

Dissolved manganese levels before the plant was shut down in 2015 prior to the plant rehabilitation project was different and lower in concentrations than what staff has been experiencing during the WTP wet commissioning in 2017. This is most likely due to the fact that the wells have been offline for an extended period. With the drought and water levels altered, concentrations of dissolved manganese are likely to be more concentrated.

During the Hazen & Sawyer (H&S) well water testing, results indicated that for 3 of the 4 Hollywood wells (with the exception of Well No. 2), concentrations of manganese started off high above the allowable regulatory limit (50 parts per billion - ppb) but dissipated over time to some degree. However, after continuous well pumping (2 week - 24 hours per day test period), the manganese concentrations in 3 of the 4 wells still remained at or slightly below and above the mandated regulatory limit of 50 ppb. Because the 3 wells are above or very near the allowable regulatory limit for manganese and the City blends its water with bypass water in the RO treatment plant, it would make water quality compliance more difficult without the addition of pre-treatment.

This would be particularly challenging when the future Maple Yard wells are anticipated to come online to the WTP in the next 9 months. The Maple Yard wells exhibited vastly different water quality from the two wells even though the wells are situated less than 80 ft. apart. Well no. 1 has dissolved manganese at > 50 ppb concentrations slightly above the regulatory limit of 50 ppb. Well No. 2, on the other hand, exhibits very high dissolved manganese concentrations in the range of 200 to 300 ppb or much more than the regulatory limit of 50 ppb.

Because the future proposed Maple Yard wells exhibit higher dissolved manganese concentrations than the existing Hollywood wells, blending of the two sources of water in the near future at the WTP would likely yield manganese concentrations above the regulatory threshold of 50 ppb. As a result, additional pre-treatment would be required or additional blending with MWD imported water.

### Iron Sulfide

A black particulate was discovered in each of the 4 wells. The black particulate was initially thought to be manganese oxide precipitate due to its dark color but was further identified as iron sulfide. Iron sulfide is formed from iron and sulfur naturally occurring in groundwater basins. Iron sulfide although not a regulated contaminant can present O&M challenges due to frequent plugging/fouling of the RO membranes. During the wet plant commissioning testing, iron sulfide was passing through both the existing and new cartridge filters to the inlet of the existing RO membranes causing frequent plugging and reducing plant test run times from a week to less than 1 hour. The anticipated frequency of membrane backwashing due to the presence of iron sulfide if unmitigated would be operationally impractical due to the long downtimes associated with the backwash cleaning operations. Additionally, the extended downtimes associated with

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the increased backwashing frequency would likely cause the well water quality to degrade causing contaminant concentrations to increase from well water stagnation.

Because the City blends treated RO water with bypassed chlorinated water, the black iron sulfide particulates would eventually enter the City's water distribution system. Iron sulfide can lead to customer complaints regarding discoloration of the water, metallic taste, and associated odor issues and consequently equate to negative public perception issues.

### **RECOMMENDATIONS**

1. There are no short-term easily implementable solutions for the changed well water quality issues of sand, manganese, and iron sulfide.
2. H&S and staff are recommending to place the WTP offline in "standby" mode to pursue long-term pre-treatment alternatives. In "standby" mode, the plant would essentially be offline with the ability to keep certain components of the plant live in order to periodically recirculate water through the plant but not distribute well water for pilot testing purposes and the continued maintenance of pumps, meters, instrumentation, and associated appurtenances. The next steps include a feasibility analysis and testing (bench scale and pilot testing), design, and permitting of near term and long term pre-treatment alternatives. Pre-treatment analyses could include chemical treatment, new filtration equipment, iron/manganese removal systems, and other alternatives.
3. Staff will be developing an implementation plan and interim operations plan that will outline next steps, cost-benefit including risks associated with each feasible alternative, required funding, and staffing impacts.



April 17, 2017

To: City of Beverly Hills Public Services, Trish Rhay, PE, Assistant Director of Public Works  
From: Lynn Grijalva, PE, Principal in Charge  
Troy Walker, Project Manager  
Nicole Blute, PE, PhD, West Region Drinking Water Lead  
cc: Vince Damasse, PE, Water Resources Manager

## Well Water Quality at the Water Treatment Plant

### Introduction

*The purpose of this technical memorandum is to summarize the water quality testing, observations, and data that impact the performance of the existing Beverly Hills Water Treatment Plant. Various water quality issues emerged in the winter of 2017 during the plant wet commissioning and pre-start up testing. The analysis of the issues, the immediate troubleshooting and optimization steps taken, and some near and long-term recommendations are presented herein. This information will be useful for the city as it prepares to **integrate future groundwater well supplies from Maple Yard and the La Brea Wells.***

An intensive two week test program was conducted by plant staff with guidance by Hazen and Sawyer that gave the information needed to supplement the observations made during the pre-startup activities in the winter of 2016-17. This memorandum highlights the findings that guide the integration of treatment for all of the City's wells.

# Hazen

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# Hazen

## 1. Background

The existing Water Treatment Plant provides the following:

- Reverse Osmosis (RO) to remove primarily hardness and Total Dissolved Solids (TDS) that causes scaling
- Although not currently equipped with iron and manganese pre-treatment, the RO system provides some level of dissolved iron and manganese removal from the groundwater depending on the concentrations
- Air Stripping to remove sulfur in the groundwater that can cause taste and odor issues
- Blending of the RO permeate stream with the bypass water to reduce corrosion and meet arsenic Maximum Contaminant Levels (MCLs). The current RO system does not treat 100% of the raw water through the RO treatment train. A portion of the water is bypassed through an air stripping tower to remove sulfur before it is chlorinated and blended back with the RO permeate water before distribution.

The current Water Treatment Plant (WTP) addresses some primary and secondary health constituents. Secondary constituents such as TDS, dissolved iron and manganese, which address primarily aesthetic concerns (taste, odor, appearance), are important to providing excellent customer service and positive public relations with the City's customers. It is anticipated that in the next approximately 10 months to seven years, the City will integrate additional water supply wells from Maple Yard and La Brea well field. The existing WTP must be capable of treating and managing the City's existing wells, in order to be prepared to receive additional water supplies.

### 1.1 Construction Complete

The Water Treatment Plant was taken off line for construction of a limited number of refurbishments and upgrades to a portion of the existing Water Treatment Plant that the City's staff had identified, such as plant waste stream drain system improvements, corrosion repairs in the clearwell, new SCADA enhancements including SCADA process monitoring reports, new chemical feed pumps, replacing air stripper tower media, and eventually replacing the existing RO membranes with new membranes (currently on-hold due to the water quality analyses testing). The treatment plant rehabilitation was limited in scope and was not intended to be a full treatment system rehabilitation of the treatment system, and did not include wells and raw water pipelines leading into the WTP. The treatment plant rehabilitation was focused on specific operational improvements to approximately 20% of the plant.

### 1.2 Preparing for Operation

Hazen and Sawyer provided hands-on training in equipment testing, startup, maintenance procedures, operations, monitoring, critical controls response and reporting. Standard operating procedures have been documented for all treatment plant components and activities. The Operations, Maintenance and Management Plan has been updated and submitted to the Division of Drinking Water. Other guidance documents have been prepared including the Emergency Management Plan, Critical Control Response

# Hazen

Plans, and Functional Control Specifications. The operations staff was involved in developing and reviewing all documents and procedures.

## 1.3 Pre-Startup Discoveries

During pre-startup activities a water quality change was clearly evident in the plant. The problems that occurred included:

- Accumulation of black and sandy sediment in the protective cartridge filters prior to the RO membrane train – much more than had been observed in the past
- Binding or plugging of the existing RO membranes in a very short run time (days to less than an hour – compared to run times of 3 to 4 months without fouling to that extent historically).

Staff and H & S postponed the installation of new RO membranes and started an investigation of whether this is a “new normal” in water quality, or if it was a temporary occurrence related to the extended downtime of the wells and raw water pipeline and restarting. The postponement was performed to prevent permanent fouling of the new membranes that have been purchased in preparation for the wet commissioning phase of plant startup. A series of investigative actions were taken by staff and H&S to protect the City’s investments at the treatment plant, determine options for operations and identify opportunities for system improvements.



**Fine Sand and Black Particles at RO Inlet**

## 2 The New Normal

The water quality from the existing Hollywood Wells is different now from the water quality that the plant experienced prior to shutdown for the plant rehab work in 2015. The constituents require attention include:

- Black particulate matter – Iron sulfide – that will clog the RO membranes and passes through some treatment processes in the bypass stream (air stripper, etc.)
- Sand – a problematic maintenance issue as it accumulates in plant processes. Fine sand passes through both the existing and new cartridge filters.
- Manganese at an elevated concentration – that becomes difficult to blend down.

Below is a description of the source of these constituents, and what we know about the system components that should control their occurrence in the Hollywood Wells and WTP.

# Hazen

## 21 Black Particulates

Fine black particulates were first observed with the sand, and became more noticeable as the sand diminished. Laboratory analysis of the material captured at each well, in the plant feed and passing through the cartridge filters identified and confirmed the black particles as iron sulfide, that is present in all four wells. The iron sulfide is formed from iron and sulfur that are naturally occurring in the reducing environment of the Hollywood Basin.



**Black Particles inside a Plant Cartridge Filter  
(a quarter is shown in the image for scale)**

Iron sulfide in its particulate form can cause the RO membranes to plug or bind up over time. This will lead to increased cleaning chemicals and much more frequent membrane cleanings. Based on the concentrations observed, and the frequent cleaning of the RO membranes during pre-startup, it is estimated that the frequency of Clean in Place (CIP) backwashes for the RO membranes could be on the order of once per week. A typical CIP backwash could take approximately 2-1/2 to 3 days to perform and bring the plant back on line. This would equate to approximately 36% to 43% downtime for the WTP to just address the iron sulfide issue from a maintenance standpoint. This amount of downtime would be deleterious for the existing wells as testing has shown that extended well downtimes leads to degrading water quality.

The iron sulfide particles were angular shaped, often attaching to sand particles or forming larger “clumps” that were easily broken apart. Similar particles were found in the plant inlet feed, captured on both cartridge filters, and even passing through both cartridge filters (existing and newly installed cartridge filters).

Additionally, since the plant incorporates a blend of chlorinated raw water with the treated RO permeate water in a clearwell (storage tank), iron sulfide would eventually show up in the City’s distribution system. Iron sulfide can lead to customer complaints regarding color, taste, and odor issues and equate to negative public perception issues.

## 22 Sand

Large volumes of sand came into the plant during pre-startup testing that built up inside the cartridge filters and inside the inlet end caps of the RO. The volume of sand was greater than the plant staff had observed historically and was no longer completely filtered by the WTP cartridge filters. Investigations found that sand was mostly very fine rounded silica. Coarse sand was coming from Well 5, and fine sand from all four of the wells. A well investigation for particulate intrusion documented the field tests that confirmed the sand and fine black particulate matter that was found in each well. The following photographs show the material that was collected during the investigation.

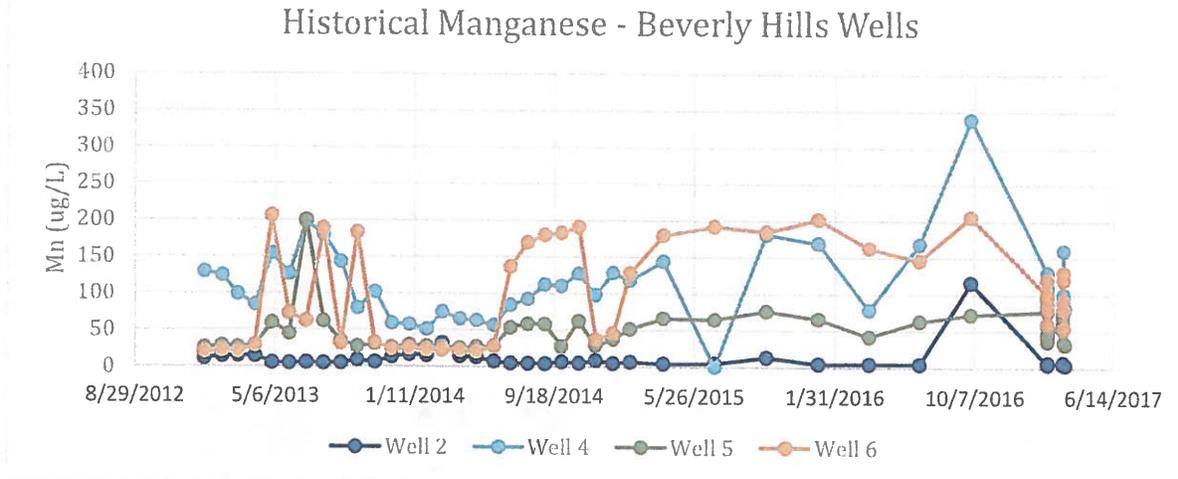
# Hazen



## 2.3 Dissolved Manganese

The existing plant was designed to remove TDS and hardness and because of the nature of RO treatment has ability to remove dissolved manganese and iron. Approximately 60% of the water is sent through the RO which removes to some extent both dissolved manganese and dissolved iron. The other 40% of the water passes only through the air stripper which does not remove either. The use of a bypass keeps sufficient minerals such as calcium in the water to minimize corrosion in the distribution system; a fully RO-treated water would require the addition of minerals back into the water. Prior to shutdown, the raw water manganese of the combined wells has been much lower in concentration that this bypass strategy has enabled the combined treated water to meet drinking water secondary standards. During the past two years, when the wells were turned on for short periods for testing and sampling, the dissolved manganese has been highly variable and can exceed the secondary MCL of 50 ppb (parts per billion). That has caused concerns about the existing treatment plant meeting water quality standards if manganese increases periodically, or has a long term trend of increasing over time. Testing of manganese levels during the recent 2-week continuous testing indicate three of the four existing Hollywood wells (with the exception of Well No. 2) have had manganese levels slightly below, at or above the regulatory secondary MCL of 50 ppb.

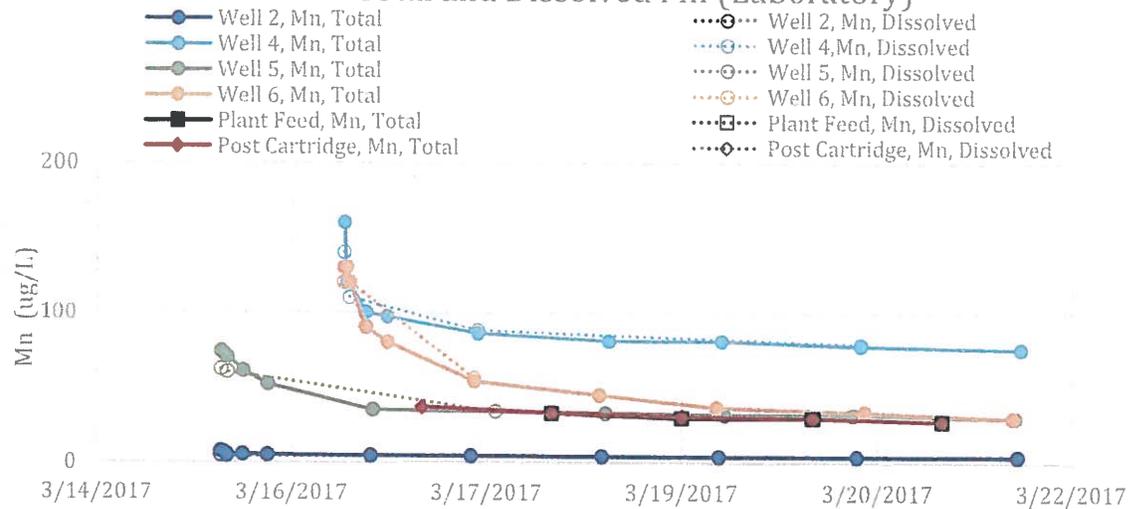
## Historical Manganese - Beverly Hills Wells



Additionally, future wells at the Maple Yard and the La Brea well field have higher manganese levels than the Hollywood Wells. The Preliminary Design Report (PDR) for La Brea has identified the need for pretreatment at the Water Treatment Plant. A greensand filter or other similar iron/manganese removal pretreatment process could potentially treat 100% of all plant feed to give full flexibility to use all of the City's wells and control the manganese below the secondary MCL of 50 ppb. Additionally, the Department of Drinking Water has informed the City that if manganese concentrations are near or above the regulatory limit of 50 ppb, they would require direct manganese treatment or support a blending station to blend with MWD at the City's existing Sunset Reservoir.

Laboratory analysis of the water from each well indicated that most or all of the manganese was in dissolved form, with a noticeable fraction of non-dissolved manganese only at well startup. The reducing environment of the Hollywood Basin would likely keep manganese in a dissolved state, with particle formation of manganese oxide only in an oxidizing environment. Only trace amounts of manganese in particulate form (less than 1% of the particles) were found in some samples according to laboratory analysis of the particles captured from the Hollywood Wells and in the Treatment Plant.

## Total and Dissolved Mn (Laboratory)

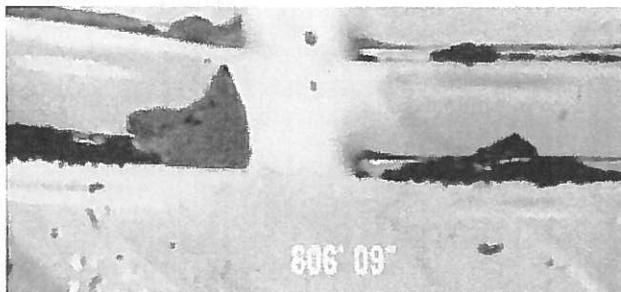


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## 24 Wells

The four Hollywood Wells are producing very fine sand in volumes greater than plant staff had experienced before. Coarse sand is greatest in the first 30 to 60 minutes after wells are turned on, then diminishes greatly, but fine sand continues to be produced from the wells during continuous pumping. The gravel pack surrounding the four Hollywood Wells may not be adequate to prevent “sanding” from the geological formation without some well rehabilitation.

Black particulate iron sulfide was also observed in the solid material in each well, heaviest in the first 30 to 60 minutes of pumping, and continuing to be produced from the wells throughout continuous pumping. Fine sand and black particulates resting on the louvered casing slots have been observed in in videos of the wells, indicating that the fine material settles out of the water.



Well 6 has iron corrosion due to dissimilar metals casing materials, which may affect the remaining life of the well, although there is only a minor occurrence of rust particles in the water produced. The well casings in wells 2, 4, and 5 are constructed of stainless steel and do not exhibit corrosion. The wells have lost some of their original capacity and the well pumps are oversized for the sustainable yield.

A comprehensive hydrogeological analysis would provide advice on the specific yield and production rate of each well, and professional advice on the rehabilitation or redrilling of any of the wells. A rehab of the existing wells would likely entail both chemical and mechanical rehabbing. The rehabilitation of the existing old wells is not without risk. Rehabbing wells could damage the existing filter pack, exacerbate the sanding issues, and potentially lead to loss in well production.

## 25 Well Pumps

The well pumps were not designed for the lower sustainable flow rate of each well, and were not designed for the additional pressure losses of new pretreatment filters and new filtration equipment that will be required when La Brea and Maple Yard wells are brought on line. The variable speed drives help to turn the pumps down to lower flows, but the existing pumps and motors may be too large for their application. The pumps and motors should be re-evaluated as part of a well rehab project if needed.

## 26 Raw Water Pipeline

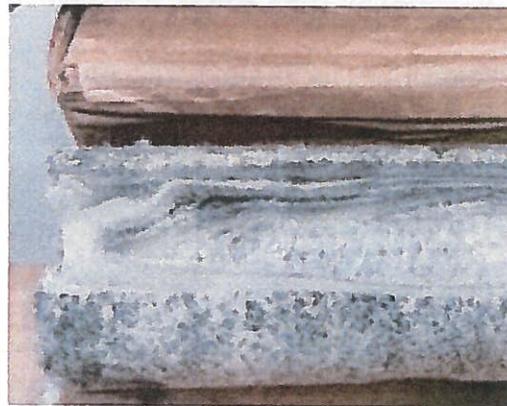
Sand and fine particulates were found to have accumulated during the extended stagnant period of plant construction and were flushed from the system using a prolonged period of high velocity. The pipe materials were investigated for the possibility that corrosion of the pipe interior was contributing iron and/or manganese particles into the water stream. That pipe was confirmed to be cement lined, eliminating corrosion as a source of iron or manganese particles. However, the City may want to

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incorporate an automatic blowoff or flush to waste piping in the existing raw water pipeline. This will enable the City to flush the wells prior to arriving at the head of the WTP should the need arise to flush out the system before introducing raw water at the head of the WTP.

## 2.7 Cartridge filters

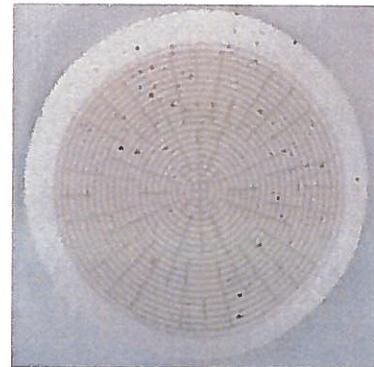
A small portion of the iron sulfide particles in the plant feed is captured on the cartridge filters, and most of the particles continue to pass through both the existing and new cartridge filters. Particles of varying size have been observed to then pass through the bypass stream to the air stripping tower and would eventually enter the distribution system if the plant was delivering water into the system. In the portion (60% of total inlet flow) that goes to RO, the particles build up on the RO membranes and can cause binding and plugging of the membranes.



Filtration equipment that can handle fine sand would need to be investigated and pilot-tested along with any pre-treatment systems for iron sulfide. Even if greensand filtration was deemed to be viable to remove dissolved manganese, it is likely that sand and iron sulfide removal would have to be addressed prior to the addition of greensand filtration to protect the greensand filters.

## 2.8 RO Membranes

Field analysis of the Silt Density Index (SDI) throughout the two week test period gave an indication of the types of material captured and also the potential for materials to bind the RO membranes. Fine rounded sand and angular iron sulfide particles were found in the water from all four wells. The small size of the particles allowed them to actually pass through the 1 micron cartridge filters. The SDI filter disk in the photograph show the particles that passed through the cartridge filters, accumulated over a day-long continuous operation. This material would then pass on to the RO membranes.



The operating experience in December through February 2017 showed that the fine material could build up quickly and require labor-intensive cleaning steps of opening the end caps and hosing out the deposited sand before restart. A typical clean-in place (CIP) procedure was tested and shown to not be adequate to prevent binding of the RO membranes. A more time-intensive and frequent routine, customized for iron sulfide would be required until the pretreatment is installed.

## **3. Recommendations and Next Steps**

1. There are no short term solutions for the issues of sand, manganese, and iron.
2. H&S and staff are recommending to place the WTP offline in standby mode to pursue long-term pre-treatment alternatives. The next steps include a feasibility analysis and testing (bench scale and pilot testing), design, and permitting of near term and long pre-treatment alternatives. Pre-treatment analysis could include chemical treatment, new filtration equipment, and other alternatives.



## STAFF REPORT

**Meeting Date:** April 27, 2017  
**To:** City Council Liaisons  
**From:** Trish Rhay, Assistant Director of Public Works  
Logan Phillippo, Management Analyst  
**Subject:** Interim Irrigation of Sunset and Burton Medians  
**Attachment:** Public Works Department Memorandum Dated March 9, 2017

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### INTRODUCTION

The aesthetic conditions of the turf on street medians along Sunset Boulevard and Burton Way have deteriorated over the last two to three years due to increased State restrictions on water use in response to the prolonged statewide drought emergency which ended officially on April 7, 2017. While the drought state of emergency is over for most of California, several restrictions remain in effect, one of which includes the watering of ornamental turf on street medians with potable water. While long-term plans for addressing the aesthetics of the medians are in development, growing concerns that the medians may remain brown have prompted the City to evaluate interim measures to improve the existing conditions of turf at the medians.

Staff seeks direction on whether to proceed with an interim plan to water the Sunset Boulevard and Burton Way medians with non-potable water from the City's Cabrillo Reservoir.

### DISCUSSION

The medians along Sunset Boulevard (4 acres) and Burton Way (3 acres) previously consisted of a total of approximately 7 acres of ornamental turf. Since approximately May of 2015, the irrigation systems at these medians have been turned off in response to State restrictions on potable water use. The medians had become brown or dead for most of this time, but after a rainy winter season, have now become populated with weeds. While the medians have been regularly maintained during this period, non-watering has limited the aesthetic quality.

On April 7, 2017, Governor Brown issued an Executive Order B-40-17, which terminates the January 17, 2014 drought state of emergency for most California Counties, but still permanently prohibits several practices that waste potable water, including the irrigation or ornamental turf on public street medians. With the drought state of emergency now over, there may not be an immediate connection from the public perspective between brown turf and State restrictions. While long-term plans for the medians along both

Meeting Date: April 27, 2017

major thoroughfares are under development, they will not result in immediate physical changes or improvements to the current aesthetic conditions and are still two or more years from implementation and completion.

At the March 9, 2017, Public Works Commission Regular Meeting, staff proposed two options to the Commission for maintenance of the turf. Option 1 consisted of maintaining the current conditions and performing regular maintenance, which includes mowing and debris removal, but not irrigation. Option 2 consisted of irrigating the medians with non-potable water collected from the City's Cabrillo Reservoir. These two options are discussed more in the attached Public Works memorandum to the Public Works Commission ("Attachment 1") and are additionally outlined below. The estimated cost for Option 2 reflects the removal of hydroseeding, reducing costs by the \$28,100 discussed in Attachment 1. Hydroseeding has been removed from the proposed interim measures due to the different conditions of the Bermuda Grass after the rainy winter season.

Options Presented at March 9, 2017 Public Works Commission Regular Meeting

Option 1	Option 2
Maintain current conditions	Improve turf conditions and irrigate with non-potable water from Cabrillo Reservoir
Estimated Two-Year Cost: \$68,686.46	Estimated Two-Year Cost: \$363,572, additional to Option 2

Staff recommended Option 1 to the Commission, citing cost as the primary factor. The Commission unanimously favored Option 2 and recommended that staff to further evaluate cost and to include an estimate of potential offsets. These are discussed in detail in the Fiscal Impact section of this report.

Proposed Interim Measures

Based on the recommendations of the Public Works Commission, staff has developed the following proposed interim measures.

Most landscaped areas at the City's parks and medians have existing irrigation systems that are connected only to potable water sources. Specifically along street medians, these irrigation systems have been turned off since watering restrictions were imposed. With the current infrastructure in place, it is recommended to improve the ornamental turf with non-potable water from the City's Cabrillo Reservoir using a truck with a 400 to 1,000 gallon tank for irrigation. Staff recommends weed abatement, followed by fertilization and regular maintenance. It is estimated to take approximately three months to improve the turf once staff is directed to proceed with the interim plan and has begun implementation. Watering three days per week is recommended during the weed abatement stages of the improvement process using existing irrigation infrastructure (approximately 3-4 weeks), which will be followed by one to two waterings per week by truck thereafter. Additionally, an organic water-retaining agent, Hydretain, will be applied on a quarterly basis, reducing the amount of water required by as much as 50%.

Staff is proposing to include the watering of medians with water collected from City non-potable sources into a new contract for Citywide landscape maintenance services, which is due to expire on June 30, 2017. In January, staff conducted a Request for Proposals ("RFP") process and evaluated proposals and pricing from three respondents. The current contractor, LandCare USA, submitted a qualified proposal and offered the most

competitive pricing. Staff intends to bring a forward a recommendation to City Council to approve a contract with LandCare USA for Citywide landscape maintenance services before the end of the current fiscal year.

Given that a new contract has not yet been executed, staff proposes to incorporate watering the medians on an as-needed basis, which would be priced per acre per watering. An agreement is being drafted that includes routine annual services from the original RFP as well as additional services for watering on an as-needed basis. Staff estimates that there are sufficient funds in the Park Operations budget begin weed abatement and fertilization in the current fiscal year, though the current contract will need to be amended for additional funds to account for these expenses. Additional funds will be required to water the medians thereafter until long-term solutions have been implemented.

### **FISCAL IMPACT**

The improvement and maintenance of the medians over a two-year period would cost approximately \$365,000, according to the tasks identified below. This would equal \$182,500 per year for each of the two years.

#### Costs

Weed abatement, a one-time task, would subdue the growth of weeds and reestablish the ornamental turf in the median (\$4,748). The application of the water retaining agent, Hydretain, would be applied four times per year to maintain soil moisture for longer periods of time (\$17,172 per year). Finally, a 400 to 1,000 gallon watering truck would be used to irrigate the medians, approximately once per week, using the groundwater from Cabrillo Reservoir (\$162,240 per year).

	Year 1	Year 2	Grand Total
Weed Abatement (one-time)	\$4,748	N/A	\$4,748
Hydretain Application (quarterly)	\$17,172	\$17,172	\$34,344
Watering	\$162,240	\$162,240	\$324,480
Total	\$184,160	\$179,412	\$363,572

#### Potential Offsets

At the March 9, 2017, Public Works Commission Regular Meeting, Option 1 for maintaining the status-quo was presented and recommended, as listed in the Discussion section of this report. This amount was estimated at \$34,343.23 per year, or \$68,686.46 over the two-year period. This service is provided to the medians annually regardless of whether irrigation takes place, and therefore is not considered an offset.

The cost to irrigate the medians has been approximately \$80,000 per year. Analysis from 2014 billing data, the most recent year for which a full calendar year is available, shows that approximately 11,600 hundred cubic feet (8.7 million gallons) of water was used at nine meters identified to be associated with each median. This cost for water is considered an offset. The cost to provide water from the Cabrillo Reservoir is not a part of this analysis.

Meeting Date: April 27, 2017

Net Fiscal Impact

To improve the conditions of the turf, the cost would be approximately \$365,000 over a two-year period (\$182,500 per year). If directed to proceed, a \$182,500 annual appropriation for two years into the Parks Operations budget would be required. Given the potential offset of approximately \$80,000 per year, or \$160,000 over a two-year period, the net fiscal impact of the interim measures would be approximately \$102,500 per year, or \$205,000 over a two-year period.

**RECOMMENDATION**

Staff seeks direction on whether to proceed with improving the turf at medians according to the interim measures discussed in this report. If directed to proceed, the cost for watering and improvement would be incorporated into an upcoming new contract for Citywide landscape maintenance services, which was developed through an RFP process. This would apply for a two-year period, and a subsequent \$182,500 annual appropriation for two years from the General Fund into the Parks Operations budget would be requested.

Shana Epstein

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Approved By



**CITY OF BEVERLY HILLS**  
**PUBLIC WORKS DEPARTMENT**  
**MEMORANDUM**

**TO:** Public Works Commission

**FROM:** Trish Rhay, Assistant Director of Public Works  
Josette Descalzo, Environmental Compliance and Sustainability Programs Manager  
David Garrard, General Park Maintenance Supervisor

**DATE:** March 9, 2017

**SUBJECT:** Burton Way and Sunset Boulevard Median Interim Plan

**ATTACHMENTS:** None

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**RECOMMENDATION**

Staff recommends that the City maintain the current condition of Burton Way and Sunset Boulevard Medians.

**DISCUSSION**

Staff was requested by the Public Works Commission to research potential options to restore Burton Way and Sunset Boulevard medians. The staff report will be presenting several options and associated costs with each option.

The recent drought and watering restrictions have deteriorated the ornamental turf lawn on Burton Way and Sunset Boulevard Medians. As a result, the median was brown and dead during the warmer months, and weeds have populated the median due to the recent storm events.

There are long term landscape solutions for Burton Way and Sunset medians. For instance, the Burton Way Green Streets project will be incorporating water efficient landscape in the final design. Final design is expected to be completed by 2018 and construction is expected to start in 2019 after the conclusion of the Santa Monica Boulevard Reconstruction Project. For Sunset median, staff is considering different landscaping design options that will be compatible with the existing utilities underneath the median.

In the interim, staff has evaluated the possible options for the medians until these long-term projects can be completed. These options are:

**Option 1:** Maintain the current conditions of Burton Way and Sunset medians at which irrigation of ornamental turf is prohibited and maintain the height of the weed population. The current annual maintenance cost is \$34,343.23. This cost includes: turf grass aerating, maintenance and fertilization. There would be no additional costs to the City to pursue this option.

**Option 2:** Restore the turf lawn conditions at both Burton Way and Sunset median and use non-potable groundwater from Cabrillo Reservoir to irrigate the medians. The following work is necessary for Option 2:

- 1) Weed abatement
- 2) Hydroseeding with warm weather ornamental turf to match existing turf
- 3) Application of water retaining agent, Hydretain
- 4) Irrigation using a watering truck.

For Option 2, weed abatement and hydroseeding work is a one-time task that would subdue the growth of weeds and re-establish the ornamental turf in the median. The application of the water retaining agent, Hydretain, would be applied four (4) times a year to maintain soil moisture for longer periods of time. Finally, a 400-gallon watering truck would be used once a week to irrigate the median using the groundwater from Cabrillo Reservoir. This work would be done at night into the early morning to reduce the traffic issues caused by closing one lane at Sunset Boulevard and Burton Way and traffic implications at Coldwater Canyon in route to filling. There noticeable noise from the watering truck en route to Cabrillo Reservoir.

By using the groundwater at Cabrillo Reservoir, the City would not be in violation of the current State Emergency Water Conservation Regulation. In February 8, 2017, the State extended the regulations that still prohibits the use of potable water to irrigate ornamental turf on public medians. Staff anticipates that this will be permanent prohibition.

In addition, Option 2 is contingent upon the reliability of groundwater source at Cabrillo Reservoir. A reliability study is underway and will be presented at the Commission at a later date.

It is estimated that the total cost for Option 2 is \$391,672 for two years for both medians. If the City decided to only proceed with one of the medians, the costs would be \$215,036 and \$195,836 for Burton Way and Sunset Boulevard, respectively.

**Table 1: Cost Estimates to Restore Ornamental Turf Medians**

Task	Sunset Blvd & Burton Way		Burton Way Only		Sunset Blvd Only	
	Year 1	Year 2	Year 1	Year 2	Year 1	Year 2
1-time Weed Abatement	\$4,748	n/a	\$2,374	n/a	\$2,374	n/a
Hydroseeding	\$28,100	n/a	\$14,050	n/a	\$14,050	n/a
Quarterly Hydretain Application	\$17,172	\$17,172	\$8,586	\$8,586	\$8,586	\$8,586
Watering	\$162,240	\$162,240	\$95,520	\$95,520	\$81,120	\$81,120
<b>TOTAL</b>	<b>\$212,260</b>	<b>\$179,412</b>	<b>\$120,530</b>	<b>\$104,106</b>	<b>\$106,130</b>	<b>\$89,706</b>
	<b>\$391,672</b>		<b>\$224,636</b>		<b>\$195,836</b>	

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Table 1 clearly shows that the watering component is the most expensive task. Staff assessed other alternatives such as using existing potable water to irrigate the restored medians. Unfortunately, this would be a violation of the current Emergency Conservation Regulation. The City can be fined up to \$500 per day per violation and the City can be prosecuted to the full extent of the law. In addition, the City would be facing very negative public perception.

Staff also assessed if watering can be done by internal staff. In order to do this, the City would need to purchase a watering truck that can spray the median. City staff would need to work extensive overtime to irrigate the medians past business hours to reduce traffic implications at the site. Finally, staff would be required to attain a Class B Driver's License to operate a watering truck. Currently, Parks Services Workers are not required to have this license.

Based on the assessment presented in this report, staff is recommending Option 1 that would maintain the current condition and maintenance level at the medians.