



DATE: January 8, 2018

TO: Council Sustainability Committee

FROM: Director of Utilities & Environmental Services

SUBJECT Review of 2017 Mountain Tunnel Shutdown and Regional Reliability Efforts

RECOMMENDATION

That the Committee reviews and comments on this informational report.

SUMMARY

The San Francisco Public Utilities Commission (SFPUC) shut down the Mountain Tunnel, a key water conveyance tunnel for the Hetch Hetchy Regional Water System, for critical inspections and near-term repairs in early 2017, and plans to do so again in late 2018 (see figure on page 2). The 2017 shutdown was necessary to assess the condition of the tunnel so that decisions can be made on whether to repair the Mountain Tunnel or build a new bypass tunnel in the future. Based on SFPUC's preliminary findings and recommendations, the overall assessment is that the tunnel can be rehabilitated and a new tunnel is not needed.

The Regional Water System Intertie (Regional Intertie) connects the East Bay Municipal Utility District (EBMUD) water system and SFPUC Regional Water Systems through the City of Hayward. The Intertie facilities are owned by EBMUD and SFPUC and operated by the City of Hayward. During the 2017 Mountain Tunnel shutdown, the City worked cooperatively with SFPUC and EBMUD to prepare the Regional Intertie for service in the event of water supply interruptions. Staff anticipates that SFPUC will continue to shutdown Mountain Tunnel annually to facilitate inspection, repairs, and routine maintenance and the City may be asked to ready the Regional Intertie for emergency use.

The Bay Area Water Supply and Conservation Agency (BAWSCA) is interested in developing a pilot water transfer that could be implemented during the 2018 or a future shutdown of the Mountain Tunnel. The pilot transfer envisions use of EBMUD's Freeport Regional Water Project to bring water to Hayward from the Sacramento River through the EBMUD system and Regional Intertie. Progress on the pilot transfer has slowed because EBMUD is not planning to operate Freeport in the near term; however, BAWSCA is actively engaged in

regional reliability efforts with other Bay Area agencies and is evaluating whether a pilot water transfer could be implemented as part of one of these studies.

On November 14, 2016, the Committee was briefed on the Mountain Tunnel outages, as well as the potential for putting the Regional Intertie into service. This report has been prepared to update the Committee on the preliminary results from the 2017 Mountain Tunnel shutdown and an update on regional reliability efforts that could involve potential use of the Regional Intertie.

BACKGROUND

The Hetch Hetchy Regional Water System (RWS) provides water to 2.6 million customers in San Francisco, Santa Clara, Alameda and San Mateo counties, including the City of Hayward. Sierra Nevada snowmelt, stored within the Hetch Hetchy Reservoir in Yosemite National Park, supplies about 85% of the water. From Hetch Hetchy, the water flows 160 miles by gravity through a series of tunnels and pipelines to the Bay Area. A key component of the RWS is the Mountain Tunnel, which was constructed in 1925 and has been in service for over ninety years. This nineteen-mile tunnel has both concrete lined and unlined sections, and carries water from the Early Intake Reservoir/Kirkwood Powerhouse, to Priest Reservoir, as illustrated in the following figure:



Mountain Tunnel Improvements Project

The SFPUC initiated the Mountain Tunnel Improvements Project to evaluate the condition of the tunnel and ensure it can meet the established performance standards of providing reliable, quality drinking water to the San Francisco Bay Area. Past inspection reports have questioned the integrity of the lined portion of the tunnel and in 2013, an Alternatives Analysis Report recommended that the lower eleven miles of the tunnel be replaced with a new bypass tunnel. That conclusion was questioned by a 2014 Technical Advisory Panel

assembled by SFPUC to review the Alternatives Analysis Report and whether the lining could be repaired or whether a new tunnel needed to be constructed. Based on the conclusions from the Technical Advisory Panel, SFPUC identified the need for further evaluation and inspection of Mountain Tunnel.

Pilot Water Transfer

Since 2012, BAWSCA has been working with EBMUD on a pilot transfer to test the feasibility of long-term transfers as an option for obtaining supplemental water supplies during drought years. The transferred water would be conveyed through the EBMUD water system and the Regional Intertie. The pilot transfer anticipates use of EBMUD's Freeport Regional Water Project, with an intake located on the Sacramento River, to deliver water to the BAWSCA service area via EBMUD's raw water and treated water distribution system and the Regional Intertie. Transfer water delivered from EBMUD would be directly used by Hayward customers in lieu of supplies from SFPUC. In turn, the freed-up SFPUC water supplies would be delivered to other BAWSCA customers.

On September 17, 2013, staff briefed Council on the proposed BAWSCA-EBMUD pilot water transfer. Council generally expressed support for the effort and directed staff to proceed with discussions. However, Council also expressed concerns with potential water quality and operational impacts to Hayward customers and directed that staff work with BAWSCA to address these concerns and ensure Hayward is adequately compensated for its role in implementing a pilot water transfer. Council agreed with staff that, although all BAWSCA members, including Hayward, benefit from additional water in dry years, Hayward alone could be uniquely impacted by taking delivery of Sacramento River water from EBMUD through the Regional Intertie.

In February 2015, the City and BAWSCA entered into a cooperative agreement to develop a pilot water transfer plan and cost-share on a consultant study to identify potential impacts on Hayward, including changes in water quality, flow and pressure that could occur as a result of the pilot transfer. The consultant study was completed in March 2016 and confirmed that reversing the direction of flow and providing Hayward with a water supply from EBMUD through the Regional Intertie could result in changes to the water system pressures and flows. While these impacts would be acceptable during an emergency or a shutdown of the Regional Water System for critical maintenance work, more analysis, data collection and potential mitigation measures would be needed before the City commits to a long-term use of the Regional Intertie during droughts or other water shortage years.

In the near-term, Hayward and BAWSCA staff have identified the 2018 Mountain Tunnel shutdown as a potential window of opportunity to implement the pilot water transfer. Implementing the pilot water transfer during the Mountain Tunnel shutdown would occur during the winter when Hayward's demands are lowest. Although not every element of the pilot water transfer may be simulated, staff believes that planning to implement the pilot water transfer during the Mountain Tunnel shutdown would allow BAWSCA to move forward with developing the institutional arrangements and completing environmental reviews and approvals needed to test the viability of water transfers as a supplemental

water supply source, while staying within the agreed upon purposes for using the Regional Intertie.

In April 2017, Hayward and BAWSCA executed a second cooperative agreement to define the scope of the pilot water transfer and develop operational, monitoring and mitigation, and communication plans that would be implemented during the pilot water transfer. Planning for the pilot transfer has not progressed due to changed hydrologic conditions. Water year 2017 was one of EBMUD's wettest years on record and it is highly unlikely that EBMUD will be operating the Freeport Regional Water Project in 2018. Therefore, BAWSCA has expressed interest in exploring whether the pilot transfer could be more cost-effectively implemented as part of broader regional water supply planning efforts being conducted by Bay Area agencies.

DISCUSSION

2017 Mountain Tunnel Shutdown

In January 2017, SFPUC shut down Mountain Tunnel for approximately sixty days to conduct a detailed tunnel inspection to both assess the condition of Mountain Tunnel and develop the technical documentation needed to recommend a preferred repair or replacement alternative. During the shutdown, SFPUC made repairs to the concrete lining and improved entry ways and access roads to reduce the potential outage time from a Mountain Tunnel failure from up to nine months to three months.

The following photos illustrate a typical crack in the concrete lining and the lining after repair.





The photo below provides a view of an improved pipeline entryway.



A draft condition assessment report was completed by SFPUC's consultant team in July 2017 and presented to the Technical Advisory Panel, detailing the results of the inspection, summarizing the current condition of the tunnel, evaluating the integrity of the tunnel rock and lining, and determining if rehabilitation of the tunnel to restore service life is possible.

The preliminary findings are that the repair alternative appears to be the most appropriate, although no formal decision has yet been made by the SFPUC.

The Technical Advisory Panel and consultant team are currently finalizing separate reports summarizing the findings and recommendations from the 2017 Mountain Tunnel shutdown. SFPUC anticipates detailing the next proposed work efforts for Mountain Tunnel shortly thereafter. A second sixty day Mountain Tunnel shutdown is planned for mid-November 2018 to mid-January 2019, where SFPUC will continue to make repairs to the tunnel lining and inspect the condition of the repairs made during the 2017 shutdown. As was the case with the 2017 shutdown, City staff may be asked to prepare the Regional Intertie for possible service. It is not anticipated that the Intertie will be needed, as winter demands are typically much lower than during the summer months, and sufficient local supplies are available to meet winter demand. The City's level of effort to ready the Hayward Intertie for use has been substantially reduced due to the installation of a flushing valve that staff installed in advance of the 2017 shutdown that greatly reduces the amount of time and effort needed to ready the Regional Intertie for use.

Regional Reliability Efforts

As discussed previously, progress on implementing a pilot transfer with BAWSCA and EBMUD has slowed since it appears unlikely that EBMUD will operate the Freeport facilities this year. However, BAWSCA has expressed interest in exploring whether the pilot water transfer and/or future transfer opportunities involving use of the Regional Intertie could be implemented as part of other regional reliability efforts. Staff is working with BAWSCA and SFPUC to monitor these efforts to ensure that other agencies are aware of the City's concerns with use of the Regional Intertie and that any impacts to the City would be addressed.

- ***Bay Area Regional Reliability:*** Eight of the San Francisco Bay Area's largest public water agencies are working together through the Bay Area Regional Reliability (BARR) partnership toward regional solutions to improve water supply reliability. BARR's first project has been to develop a regional Drought Contingency Plan (DCP). The DCP addresses potential drought-related impacts. In addition, the DCP identifies regional drought mitigation projects that, when implemented, could provide increased drought reliability and redundancy.

The BARR agencies were recently awarded grant funding to develop a Bay Area Regional Water Market (Exchange/Transfer) Program, which would test the concept of interagency water transfers/exchanges. Many of the BARR agencies have been separately exploring potential pilot transfers/exchanges. BAWSCA is a participant in the BARR effort and is interested in evaluating whether the EBMUD-BAWSCA pilot water transfer could be implemented as part of this Regional Water Market Program. The BARR agencies anticipate evaluating potential transfer and exchange concepts in 2018, with the most feasible pilot transfers being considered for implementation in 2019. Therefore, even if the EBMUD-BAWSCA pilot water transfer is implemented as part of the BARR effort, it is unlikely that the pilot transfer would be implemented during the 2018 Mountain Tunnel shutdown.

- ***Expansion of Los Vaqueros Reservoir:*** The Los Vaqueros Reservoir, owned and operated by Contra Costa Water District (CCWD), is located in southeastern Contra Costa County and has a current capacity of 160 acre feet, or approximately fifty-two million gallons. CCWD is considering an expansion of the reservoir to 275 acre feet, the equivalent of nearly ninety million gallons, in order to improve the quality and reliability of regional water supplies. As part of the planning for this expansion, CCWD is working with local agency partners, including SFPUC, BAWSCA, and EBMUD, to determine how the additional storage capacity could be used to meet the needs of customers outside of the CCWD service area.

SFPUC and BAWSCA have identified a potential need for additional water supplies from the project. One of the alternatives for providing these additional supplies to SFPUC and BAWSCA's service areas could potentially involve routing water through the EBMUD water system to the Regional Intertie. As with the pilot transfer described previously, the potential use of the Regional Intertie to convey supplemental water from the expanded Los Vaqueros Reservoir to SFPUC/BAWSCA's service areas could cause adverse impacts to City customers.

In mid-2017, CCWD, EBMUD, SFPUC, and BAWSCA, and Hayward met to discuss the City's concerns. CCWD is exploring a broad range of alternatives during the planning and environmental phase of the project and potential partner agencies have not been asked to provide a firm commitment to participate in the project at this point. CCWD agreed to incorporate a discussion of the Regional Intertie and potential impacts on the City's customers in the environmental document. On June 30, 2017, CCWD released the draft environmental documentation for the project. Staff reviewed and determined that our concerns had been sufficiently addressed. CCWD has applied for State funding for this project, and intends to verify partner interest in 2018. Staff will continue to monitor this project closely and work with other agencies ensure that Hayward's interests are represented.

STRATEGIC INITIATIVES

This agenda item does not directly relate to one of Council's Strategic Initiatives.

ECONOMIC IMPACT

There will be no impact on Hayward ratepayers related to Hayward's work to ready or operate the Regional Intertie during future shutdowns of Mountain Tunnel for maintenance and repair. Similar to the 2017 shutdown, SFPUC will reimburse the City for all costs to prepare the Regional Intertie, as well as any costs associated with operating the facility if it is placed into service. Likewise, staff anticipates that all operational costs incurred by Hayward specifically related to a potential pilot water transfer implemented during a Mountain Tunnel outage would be reimbursed by BAWSCA and/or other partnering agencies.

FISCAL IMPACT

If the Regional Intertie is operated during a Mountain Tunnel shutdown, all costs will be reimbursed to the City from SFPUC, with no impact to the Water Enterprise Fund. If a pilot water transfer is implemented, Hayward's costs would be limited to staff time needed to develop plans and agreements. All operational costs directly related to Hayward's efforts to implement the water transfer is anticipated to be borne by BAWSCA and/or other partnering agencies, with no impact on the Water Enterprise Fund. There would be no impact on Hayward's General Fund.

SUSTAINABILITY FEATURES

The efforts described in this report are critical to ensuring water supply reliability, both locally and throughout the Bay Area region. SFPUC's actions to repair and improve Mountain Tunnel will help mitigate the potential for potential supply outages and ensure long-term supply reliability.

PUBLIC CONTACT

During the Mountain Tunnel shutdowns, SFPUC relies on local water sources. The water will meet all federal and state drinking water quality standards, but customers may detect a difference in the taste and odor. Depending on the extent of the changes, it may be necessary to notify sensitive customers by direct contact and alert the general population through media, the City's website and other outlets.

NEXT STEPS

Staff will continue to work cooperatively with SFPUC, BAWSCA and EBMUD on efforts related to the Mountain Tunnel shutdowns and potential water transfers that could involve use of the Regional Intertie and keep the Committee apprised of progress.

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