



THE METROPOLITAN WATER DISTRICT
OF SOUTHERN CALIFORNIA

Board Information

- **Board of Directors**
One Water and Stewardship Committee

2/11/2025 Board Meeting

9-3

Subject

Update on treatment approaches, contingencies, and amendments to the High Desert Water Bank Program agreement.

Executive Summary

This letter provides an update on the status, debt financing, groundwater modeling, and water quality of the High Desert Water Bank (HDWB or Water Bank) Program with Antelope Valley-East Kern Water Agency (AVEK). In September 2023, the Metropolitan Board authorized additional funding for the HDWB to cover costs due to (1) higher-than-anticipated rates of inflation due to supply chain constraints and other factors; (2) revisions to the design, construction, and operation of the Water Bank's recharge and recovery facilities; and (3) the need for additional electrical infrastructure to support the operation of the Water Bank's facilities. Staff provided the Board with additional information related to the potential need for arsenic treatment and estimated costs and also provided information regarding the detection of nitrate. At that time, additional analysis and modeling were needed to better understand the groundwater basin's potential water quality changes over time and the project's potential impacts on nearby private and agricultural wells. The modeling is complete, and the results helped staff identify the appropriate arsenic treatment technology and optimize the design of the arsenic treatment system. There are also several considerations that are being evaluated that may lead to a more comprehensive and cost-effective approach to address arsenic and nitrate.

In December 2024, Metropolitan entered into a System Conservation Implementation Agreement (SCIA) with the United States Bureau of Reclamation (USBR). Under the SCIA, USBR agreed to provide \$82 million in funding for the Water Bank in exchange for Metropolitan leaving 168,000 acre-feet (AF) of conserved Colorado River water in Lake Mead. Funding provided by USBR under the SCIA could be withdrawn by future congressional action or delayed by the new federal administration. Staff will continue to monitor developments and provide updates as more information becomes available.

In the adopted Biennium Budgets for Fiscal Years 2022/23-2023/24 and 2024/25-2025/26, the Board approved debt financing the HDWB to reduce cash expenditures. The HDWB Agreement term ends on September 20, 2037; however, in order to debt finance the capital costs of the HDWB over a longer term of the project's useful life, the HDWB Agreement must be amended to authorize the debt service payments of the bonds and extended to accommodate the maturity of the bonds to be issued.

Staff will return to the Board to request authorization for recommended treatment approaches and costs, and any necessary amendments to the HDWB Agreement, and to provide regular updates.

Fiscal Impact

The HDWB Program has two main financial components: (1) capital costs that will be financed, and (2) operating and maintenance (O&M) costs. The financed capital costs will be amortized over a term of up to 30 years, while the O&M costs will span through 2057, the new term of the HDWB Agreement after execution of the optional extension provision. Staff anticipates that the long-term bond financing for board-approved capital costs to date

will have an annual debt service payment of approximately \$10.4 million, depending upon debt structure and market conditions at the time of sale. The primary O&M costs are estimated to be \$0.60 million annually.

Alternative strategies identified by staff for the treatment of arsenic and nitrate will have additional capital and O&M costs. The preliminary estimated capital and O&M costs for arsenic treatment range from \$44 million to \$55 million (in total) and \$6 million per year, respectively. The range of the preliminary estimated capital and O&M costs for nitrate treatment are up to \$250 million (in total) and \$4 million per year, respectively.

In addition, staff and AVEK will be working to develop options to mitigate the impacts of the HDWB operations on nearby wells.

Applicable Policy

By Minute Item 50302, dated November 10, 2015, the Board authorized entering into an agreement for Storage and Exchange Programs with AVEK.

By Minute Item 51564, dated April 9, 2019, the Board authorized entering into an agreement for the High Desert Water Bank Program with AVEK.

By Minute Item 55360, dated September 12, 2023, the Board authorized up to \$80 million for additional costs associated with changes to the High Desert Water Bank Program with AVEK.

Metropolitan Water District Administrative Code Section 4203: Water Transfer Policy

Metropolitan Water District Administrative Code Section 11104: Delegation of Responsibilities

Related Board Action(s)/Future Action(s)

Staff plans to return to the Finance and Asset Management Committee in March or April 2025 to bring an Amended and Restated HDWB Agreement, together with other required bond-related documents, for the Board's consideration.

Details

Background

In April 2019, the Board authorized the General Manager to enter into an agreement with AVEK (the HDWB Agreement). At that time, the Board approved capital payments for the HDWB Program of up to \$131 million.

In March 2023, staff informed the Board that resampling of the first four pilot recovery wells revealed that arsenic levels in all four wells were above the Maximum Contaminant Level (MCL) of 10 micrograms per liter (µg/L), ranging from 11 to 19 µg/L. Based on the water quality data, performance requirements, project constraints, and cost-effectiveness for large flow rates, coagulation followed by sedimentation was the recommended treatment process. Staff provided a preliminary cost estimate for the construction of a treatment facility and its O&M. Nitrate levels in the ten completed recovery wells range from 2.7 to 5.9 milligrams per liter (mg/L) as nitrogen (N), below the MCL of 10 mg/L as N. However, these levels are higher than the background levels in the California Aqueduct and Metropolitan's systems.

In September 2023, the Board authorized additional funding for the HDWB of up to \$80 million for various unforeseen issues that have impacted the HDWB and increased estimated costs since it was approved in 2019. These include: (1) higher-than-anticipated rates of inflation due to supply chain constraints and other factors; (2) revisions to the design, construction, and operation of the Water Bank's recharge and recovery facilities, which are necessary to achieve the original performance targets; and (3) the need for additional electrical infrastructure to support the operation of the Water Bank's facilities. The additional \$80 million did not include the then-unknown water quality treatment capital costs for arsenic (\$44-\$55 million) or nitrate (up to \$250 million), which are explained in more detail below. Combined with the original approval for \$131 million, the additional \$80 million results in a total of \$211 million in authorized expenditures.

In December 2024, AVEK's consultants, Montgomery & Associates and Stantec, completed additional groundwater modeling for the HDWB, confirming that the one-year recharge goal of 70,000 AF is achievable. However, due to groundwater mounding during recharge, infiltration rates decrease, and the project cannot sustain

recharge rates to store a full 70,000 AF every year within a four-year period. Continuous recharge for periods longer than one year is projected to increase the likelihood of groundwater levels rising above 75 feet below ground surface (ft bgs) beneath the California Aqueduct, which would require a modification to recharge operations to limit additional groundwater level rise to less than 50 ft bgs. Groundwater levels above 50 ft bgs beneath the aqueduct could increase the likelihood of liquefaction and hydro-collapse during an earthquake near the HDWB, which could damage the aqueduct. If conditions were such that there was a need to continuously store supplies, the project could recharge about 64 percent of the 280,000 AF total storage volume. In other words, it would take longer than four years to fully store the 280,000 AF. Additionally, the study confirmed that the one-year recovery goal of 70,000 AF is achievable. However, the total projected recovered volume will depend on the frequency of recovery and available stored water due to mounding.

In January 2025, Montgomery & Associates also completed a report to assess the potential impacts of the HDWB operations on nearby private domestic wells and Tejon Ranch (TR) groundwater wells. Groundwater levels are projected to rise during recharge and fall during recovery compared to levels prior to HDWB operation in the three private domestic wells located immediately east of the HDWB and the two TR wells located on the HDWB property. Lower groundwater levels in the wells may require the owners to modify well operations and may result in temporary higher pumping costs. Conversely, groundwater level rise during recharge events could result in greater well production and/or lower pumping costs. TR requested an analysis of multiple operating scenarios for their wells. The model results indicate that the TR's pumping capacity would decline in all scenarios. The maximum total reduction in pumping capacity for the TR wells is approximately 44 percent of the original total capacity of the wells. Staff has asked AVEK to evaluate the potential impact of the pumping of the TR wells on AVEK's ability to pump water from the HDWB recovery wells. Depending on the results of the analysis, staff and AVEK will work with TR to develop options for considerations to mitigate the pumping impacts.

As of January 2025, Metropolitan has paid approximately \$100.95 million and \$1.03 million to reimburse AVEK for Water Bank capital and O&M costs, respectively. AVEK has completed the construction of ten recovery wells, five monitoring wells, and the turn-in/turnout facilities for the California Aqueduct. Construction of the Stage 1 Recharge Basins was completed in July 2023, and delivery of State Water Project (SWP) supplies to the Water Bank began in September 2023. Construction of the Stage 2 Recharge Basins was completed in September 2024, and Metropolitan began delivering SWP supplies to the Water Bank in October 2024. To date, Metropolitan has stored about 45,000 AF before losses. There are no fees to put water in the HDWB. However, Metropolitan will pay AVEK a recovery usage fee of \$100/AF (escalated annually by the Consumer Price Index). Additionally, 10 percent of the water Metropolitan delivers for storage is subject to a one-time loss/leave behind.

Amendment(s) to the Existing Agreement

Staff is working on amendments to the agreement to include updated language related to the design changes, operation and maintenance, funding for the water treatment facilities, and requirements to comply with the SCIA with USBR.

Water Quality Update

Arsenic and nitrate are constituents of concern at the HDWB. Based on the samples collected from the ten existing wells, the average arsenic concentrations range from 8.4 µg/L to 20 µg/L, which exceed California's primary MCL for arsenic of 10 µg/L. The average nitrate concentrations range from 2.7 mg/L to 5.9 mg/L, which are less than California's primary MCL for nitrate in drinking water of 10 mg/L as N, but are above Department of Water Resources (DWR)'s Pump-In Policy requirements and higher than Metropolitan's current nitrate levels. In September 2023, staff informed the Board that additional modeling was required to help staff select the appropriate treatment technology and optimize the design of the treatment system and remaining recovery wells.

In October 2024, AVEK's consultant, Stantec, completed the Water Bank Groundwater Treatment – Design Development Study. The objectives of the study were to: (1) answer key technical questions and prepare an updated cost estimate for the preferred arsenic treatment system, and (2) develop a conceptual nitrate management option including treatment alternatives. For the arsenic treatment, a coagulation followed by sedimentation process was selected due to its low process energy cost, minimal maintenance requirements, ability to handle long periods of non-operation, and quick start-up after non-operation. The recommended nitrate treatment alternative is

ion exchange. Ion exchange systems are simple to operate, can be monitored remotely, can target specific contaminants, and have small footprints. The capital and O&M costs will depend on the target nitrate concentration set for the HDWB water.

Arsenic

The recommended treatment process to meet the MCL consists of coagulation, flocculation, and sedimentation to precipitate the arsenic and remove it through the settling of particles. Like traditional treatment plants, coagulants are added to the water and are thoroughly mixed prior to flocculation. The flocs then settle in the sedimentation basin to form a layer of sludge. The effluent water from the sedimentation basins will be sent back to the aqueduct. There were two alternatives evaluated for the flocculation-sedimentation processes in the study: (1) a conventional treatment train involving mechanical flocculation and typical sedimentation basins with mechanical sludge removal (Option 1); and (2) a simple, non-mechanical system involving hydraulic flocculation and dual-purpose sedimentation basins that accumulate sludge and are taken offline for dewatering and drying in the basin (Option 2). The estimated capital cost ranges for treatment Options 1 and 2 are \$120 million – \$190 million and \$44 million - \$55 million, respectively. Option 2 better meets the project constraints with reduced mechanical equipment and maintenance. The estimated O&M cost for this option range from \$6 million – \$11 million per year.

Nitrate

Although the nitrate levels in the recovery wells are below the California primary MCL for drinking water of 10 mg/L as N, they exceed the ambient water quality levels in the SWP Aqueduct. Staff previously informed the Board that nitrate may also require treatment to comply with the Department of Water Resources' (DWR) Pump-in Policy and Metropolitan's Board-adopted policy governing the introduction of new water sources into treated and untreated conveyance facilities. As an alternative to the treatment approach described below, and consistent with DWR pump-in policy, Metropolitan intends to work with DWRs Facilitation Group and advocate for introducing HDWB supplies without nitrate treatment. Since Metropolitan is the largest downstream SWP Contractor, staff does not anticipate any issues. Metropolitan understands that there are some member agencies that may be impacted by increased Nitrate levels in SWP supplies. Metropolitan will work with the member agencies to determine acceptable Nitrate concentrations. If treatment is ultimately required, the potential treatment alternative under consideration for the Water Bank is the ion exchange technology. The estimated capital and O&M costs for ion exchange treatment depend on the target nitrate concentration set for the HDWB water. The estimated capital and O&M costs to treat nitrate in the HDWB to below 0.7 mg/l, which is the current nitrate level of the SWP water, are up to \$250 million and \$4 million per year, respectively.

Project Partnership as an Alternative to Direct Treatment for Arsenic and Nitrate

Staff has been in discussions with the Los Angeles Department of Water and Power (LADWP) to evaluate the possibility of constructing new infrastructure as well as utilizing existing infrastructure to move water from the HDWB to the LA Aqueduct, which passes near the HDWB on its way into the City of Los Angeles. Moving water directly to the LA Aqueduct would avoid the need to introduce water into the SWP and would potentially remove the need to construct nitrate or arsenic treatment facilities at the HDWB. LADWP and Metropolitan are considering entering into a Memorandum of Agreement (MOA). The intent of the MOA is for LADWP and Metropolitan to collaborate, explore, and potentially develop a mutually beneficial water supply management project to utilize existing and planned infrastructure to help address issues with the Water Bank's water quality, as well as water delivery to the SWP-dependent area in the west side of Metropolitan's service area.

Finance Update and Proposed Agreement Amendments

In the adopted Biennium Budgets for Fiscal Years 2022/23-2023/24 and 2024/25-2025/26, the Board approved debt financing the HDWB to reduce upfront cash expenditures. Staff and the bond financing team considered options to debt finance the HDWB Program using Metropolitan's revenue bond program or an alternative project financing approach utilizing a third-party JPA. Staff recommends the JPA approach considering benefits to the preservation of Metropolitan's debt capacity and debt service coverage. To debt finance the capital costs of the HDWB Program, utilizing the AVEK Finance Authority JPA, the HDWB Agreement must be amended and restated to include required payment provisions. These amendments include the addition of a schedule of

installment payments that will match the debt service payments of the bonds; securing Metropolitan's obligation to pay installment payments as a first-tier parity obligation under its Master Subordinate Resolution; and extending the agreement's term to match the maturity of the bonds to be issued. In addition to an Amended and Restated HDWB Agreement, staff will seek approval of other debt-finance-related agreements from the Finance and Asset Management Committee to effectuate the bond transaction.

Summary

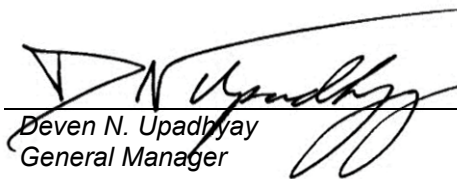
The estimated range for arsenic treatment capital costs for Option 1 and Option 2 are \$120 million – \$190 million and \$44 million - \$55 million, respectively. The estimated capital and O&M costs to treat nitrate in the HDWB to below 0.7 mg/l, which is the current nitrate level of the SWP water, are up to \$250 million and \$4 million per year, respectively. In December 2024, Metropolitan entered into an SCIA with USBR under which USBR agreed to provide \$82 million in funding for the Water Bank in exchange for Metropolitan leaving 168,000 AF of conserved Colorado River water in Lake Mead. The funding will defray Metropolitan's overall costs on the project by paying for the construction of new infrastructure such as wells, recovery facilities, water treatment facilities, and on-site electrical. Funding provided by USBR under the SCIA could be withdrawn by future congressional action or delayed by the new federal administration. Staff will continue to monitor developments and provide updates as more information becomes available. Staff will work with DWR to determine if a revision to the existing pump-in policy on the SWP is an appropriate approach to avoid treatment for nitrate. Staff will also continue to work with LADWP to enter into the MOA and collaborate on a project that will be mutually beneficial for water supply management by utilizing existing and planned infrastructure to potentially reduce water quality capital treatment costs related to arsenic and/or nitrate. Staff will seek approval for the debt finance-related amendments to the HDWB Agreement from the Finance and Asset Management Committee in March or April 2025. Staff will incorporate committee feedback and return to the Board to request authorization for the additional costs for treatment options, and necessary contract amendments in the fourth quarter of 2025.



Brandon J. Goshi
Interim Manager
Water Resource Management

2/5/2025

Date



Deven N. Upadhyay
General Manager

2/5/2025

Date